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

Final Report

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While we benefited from the help of others, we alone are responsible for any errors or omissions in the report. Any opinions expressed in the report also are our own and do not necessarily reflect the views of any of the involved organizations.

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EXECUTIVE SUMMARY

The Center for Health Care Strategies' (CHCS) Medicaid Value Program (MVP) sought to test interventions seeking to improve care for adult Medicaid beneficiaries with multiple chronic conditions. The program was funded by a grant from Kaiser Permanente, with additional funding from the Robert Wood Johnson Foundation. This report provides Mathematica Policy Research's (MPR) evaluation of the MVP program and the estimates of program effects produced by the programs themselves. This study was funded by CHCS to identify best practices and lessons for future replication or testing. This report is composed of two parts—a cross-cutting analysis of findings, and case studies for each of the 10 interventions tested through the MVP program.

BACKGROUND: MVP AND THE EVALUATION

MVP sought to build knowledge about effective interventions for Medicaid beneficiaries with multiple chronic conditions. MVP grantees were selected through a competitive process. The solicitation was directed to state Medicaid agencies and the organizations with whom they contract to deliver care. Applicants had relative flexibility to define their target populations and intervention strategies as long as they were focused on clients who each had multiple chronic conditions. An independent review panel reviewed applications to provide feedback on their relevance, strength, and the likelihood that each applicant could implement the intervention within the time and with the resources available. The evaluation team provided feedback to the panel on each applicant's evaluability.

Of the organizations submitting proposals, 10 were ultimately selected. Each team received $50,000 to help offset its costs but was expected to otherwise self-finance its effort. Each "innovation team" was expected to participate in periodic meetings, work with CHCS (and MPR) on implementation and evaluation design, and share information on its efforts and data on their process and outcome measures. The original timeline of about 17 months (September 2005 to January 2007) was extended another six months to compensate for start-up delays and to allow more time for the interventions to generate effects.

The evaluation sought answers to four basic questions:

1. What interventions did MVP grantees implement and what were they trying to achieve with these interventions?

2. To what extent were MVP grantees successful in implementing their interventions and what factors facilitated or impeded this?

3. Did the interventions achieve the outcomes or impacts sought? If not, why? And if so, how? What factors could have made the intervention more successful?

4. How generalizable is the MVP experience? That is, what was learned about the various models as well as their replicability and utility?

Given the availability of resources, the evaluation relied on grantee-submitted information to assess intervention processes and outcomes, complemented by periodic telephone calls and two rounds of formal interviews. Each round consisted of as many as four or five interviews per team to learn more about the experience and how to interpret the data.

To support the program and evaluation, MPR worked with grantees to identify the "logic model" for each of their interventions and used it to define a small number of process and outcome measures that would be tracked over time, preferably for the intervention and a suitable comparison population. MPR helped CHCS develop a template to structure reporting requirements that captured this and other important information. While this structure could not ensure that a rigorous evaluation would be possible, it provided good information on each intervention, some perspectives on its potential, and guidance on priorities for the future.

GRANTEES' INTERVENTIONS WERE DIVERSE

The 10 MVP teams all sought to improve care for Medicaid beneficiaries, but they did so in a variety of ways and focused on different populations. Table 1 summarizes the interventions tested throughout MVP. Key features of the interventions can be summarized as follows.

- ***Target Population.*** Target populations varied, with four grantees targeting patients with diabetes and comorbidities, three focusing on mental health and substance abuse care, and two grantees focusing more generally on those at high risk for adverse events and clients with high overall costs (and multiple chronic medical conditions). The remaining grantee was more methodologically focused on comparative assessment of health risk screening tools to support systems redesign.

- ***Intervention Focus.*** Of the nine care-focused programs, seven targeted their interventions on patients, all but one of them using a case management and coordination model to improve patient care. The exception augmented a pre-existing disease management program with in-person patient education. Two grantees targeted their intervention on providers, in the hopes of improving the quality of patient care.

- ***Duration.*** Only two interventions were of very short duration (less than 12 months); the rest had reporting periods of 12 months or more, with an average of 15 months. Two interventions had at least a year of operational experience prior to the start of MVP.

GRANTEES SUCCEEDED IN IMPLEMENTING THEIR INTERVENTIONS THOUGH NOT NECESSARILY AS RAPIDLY AS THEY HOPED

Grantees generally were able to implement the interventions they sought and create the partnerships needed to support those interventions, though in some cases refinements were made.

TABLE 1

BASIC CHARACTERISTICS OF MVP GRANTEES AND THEIR PILOT INTERVENTIONS

Grantee	Intervention Description	Focus	Target Patient Population	Approximate Size of Patient Population	Study Design	Start Date (Mos. Operational)
CareOregon	Complex case management	Patient based	Costliest patients (top 3 to 5 percent)	330 intervention and 600 comparison	Comparison group	October 2005[a] (12)
Comprehensive Neuroscience	Health utilization summaries	Provider based	Patients with schizophrenia (summaries sent to their primary care providers)	3,000 patients (2,271 treatment and 729 controls)	Randomly assigned treatment and control groups	May 2005 (17/9)
DC Medical Assistance Adm.	Medical house call program	Patient based	Elderly patients with chronic medical conditions in home setting	85 patients served and 650 comparison	Comparison group	January 2004[b] (27)
Johns Hopkins HealthCare	Integrated case management	Patient based	Patients with multiple chronic conditions and substance abuse issues	100 intervention and 100 comparison[c]	Comparison group	October 2005 (16)
Managed Health Services	Comparison of two health risk assessment tools	System redesign	SSI clients enrolled in managed care program from April 2005 to November 2005	3,000 (2,800 with at least one assessment completed)	Not applicable	April 2005 (13)
Memorial Healthcare System	Health navigator (case management)	Patient based	Patients with 2 or more conditions, including at least asthma, CHF, diabetes, or hypertension	120 treatment and 40 controls[c]	Randomly assigned treatment and control groups	February 2006 (15)
McKesson Health Solutions	Group diabetes education sessions moderated by health educators	Patient based	Diabetic patients (including those with cardiovascular disease) in state using the McKesson disease management program	28 treatments completed all four sessions and 70 controls[d]	Randomly assigned treatment and control groups	Sessions in April and August 2006 (5/3)
Partnership Health Plan	Preventing Heart Attacks and Strokes Everyday (PHASE)	Provider based	Diabetics with hypertension, cardiovascular disease, or depression	225 intervention and 1,650 comparison[c]	Comparison group clinics	January 2006 (15)
University of California, San Diego	Depression care manager (IMPACT)	Patient based	Diabetic patients with depression participating in a diabetes disease management program	100 patients in intervention group	Three intervention clinics (no comparison group)	July 2006 (10)
Washington State DSHS	Integration of primary, MH/SA, and LTC care with a care coordination team	Patient based	Aged, blind, and disabled Medicaid patients (many of whom have mental health or substance abuse issues)	Average monthly caseload of 2,400, 15,000 comparison	Comparison group	January 2005 (18)

Note: All sample sizes are as reported by grantees as of April 2007, when grantees last reported measures to CHCS.

[a]The first care coordination team was formed as of this date; the number of patients is as of November 2006.

[b]The program began in 1999, but the DC Medical Assistance Administration chose to evaluate it beginning in January 2004. About 500 clients make up the intervention group.

[c]These programs began with more patients but have lost some to disenrollment over time. See case studies in Part 2 of this report for more information.

[d]McKesson randomly assign about 80 patients to the treatment group, but two-thirds decided to not participate in the intervention.

CHF=Congestive Heart Failure; DSHS=Dept. of Social and Health Services; SSI=Supplemental Security Income; MH/SA=mental health/substance abuse; LTC=long-term care.

Start-up delays were common among the grantees. Grantees varied in the size of the intervention group they aimed for from the start, with two substantially larger than the others. The small size of the target populations for many interventions reflects a combination of inherently small numbers of people with certain complex conditions, limited resources of some grantees, and the challenges associated with recruitment for some of the interventions (such as problems with contact information and lower than expected disease prevalence).

LEADERSHIP COMMITMENT AND OTHER FACTORS ARE CRITICAL FOR IMPLEMENTATION TO SUCCEED

The evaluation identified at least five factors that were important across grantees in influencing their success at implementation. First, and consistent with many other studies, nearly all the grantees said that strong leadership commitment from the top of their organization was very important. Second, grantees were most successful at implementation in environments where conditions were favorable—that is, where there were no competing priorities or constraints that limited the attention to (and sometimes the resources for) the intervention. Third, staff, patient, and provider buy-in is critical; staff and patient buy-in is essential in patient-based interventions and provider support essential if changing provider behavior is the focus. Fourth, support and leadership by the Medicaid agency is critical for many grantees to open doors because the agency has authority over program policy and operations; for some, however, equivalent leadership by organizations given major authority by the state can substitute for Medicaid support. Fifth, the ability to standardize the intervention early on, with highly-specified intervention activities and protocol documentation, made it much easier to communicate what was needed and avoid later delays or confusion among those who implement the interventions.

GRANTEES FOUND IT EASIER TO IMPLEMENT THE INTERVENTIONS THAN TO GENERATE EVIDENCE OF THEIR EFFECTS ON OUTCOMES

Each grantee succeeded in implementing its intervention as intended (though perhaps not at the intended scale or speed). However, grantees found it easier to implement changes to their interventions than to design them so that intervention outcomes could be rigorously evaluated. Such an evaluation requires that implementation be strong, solid measures of process and outcome be reported, appropriate comparison data be available for similar populations not subject to the intervention, and intervention scale be sufficiently large that program effects of meaningful magnitude can be detected if they exist.

Through their work with CHCS and MPR, all MVP grantees developed and reported some data on process and/or outcomes for the population in which they intervened. Grantee reporting periods ranged from fewer than 6 months (UCSD) to 27 (DCMAA); the average reporting period was about 15 months and 8 of 10 grantees reported data for 12 months or more. However, individual participants may have participated in interventions for shorter periods of time since many of the interventions had rolling enrollment.

Given the objectives of MVP, understanding what the interventions may yield in terms of improved care for Medicaid beneficiaries with multiple chronic conditions was an important

question for analysis. Whether this question could be answered depends on: (1) the clarity of the intervention (can it be described operationally) and whether it was implemented; and (2) the rigor with which it is possible to determine whether the change had positive effects on outcomes.

To support our analysis of outcomes, we examined each project to assess it against these two criteria (see Table 2). The projects generally were stronger on the first criteria than the second. While most grantees had at least "medium" strength in terms of the clarity of their intervention, definition of the target population, and consistency with available evidence of good practice, only two had a sufficiently well-defined comparison group design, sample size, and patient participation rate (where applicable) to support a rigorous assessment of impacts (Washington State, CNS).[1] While this is a major limitation to our overall assessment of MVP, reported findings on the intervention process for other grantees suggest some innovative and potentially promising programs were successfully implemented.

[1] The strongest analyses of outcomes (an "impact study") include an assessment of intervention-comparison differences with appropriate statistical tests. Only two grantees provided tests for all their outcome measures (CNS, McKesson) and a third (Hopkins) did so for one measure. Most grantees had neither the organizational capacity to conduct these tests nor adequate person-level data. However, for grantees that had large sample sizes and plentiful data, we could make some educated guesses as to the promise of interventions based on the reported measures and what we learned about the interventions during the evaluation.

TABLE 2

RATINGS OF GRANTEES' INTERVENTION DESIGNS, IMPLEMENTATION, AND IMPACT ANALYSES

	Patient-based Interventions							Provider-based Interventions		System Redesign
	CareOregon	DCMAA	Hopkins	McKesson	Memorial	UCSD	Washington State DSHS	CNS	Partnership	MHS
Intervention										
Design	**Low**	**Medium**	**Medium**	**Medium**	**Medium**	**High**	**High**	**Medium**	**High**	**N.A.**
Implementation	**Medium**	**Medium**	**Medium**	**Medium**	**Medium**	**Low**	**High**	**Medium**	**Medium**	**N.A.**
Impacts Analysis										
Research Design	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**	**High**	**High**	**Low**	**Low**
Impacts on Outcomes	**Unknown**	**Unknown**	**Unknown**	**Unknown**	**Unknown**	**Unknown**	**Yes**	**No**	**Unknown**	**N.A.**

N.A. = not applicable.

OUTCOMES FOR THE TWO MOST RIGOROUSLY DEFINED EVALUATIONS SHOW POSITIVE RESULTS FOR ONE BUT NOT THE OTHER

Washington State's Medicaid Integration Partnership focused on better coordination of primary care, mental health, substance abuse, and long-term care for categorically needy aged, blind and disabled beneficiaries. Under the intervention, these services (previously provided separately) were integrated under one contract with a single health plan (Molina Healthcare of Washington), on a phased basis, including health risk assessment, monitoring of patient symptoms, provider education, and coordination of services, which is particularly intense for those with extensive needs. All eligible beneficiaries were automatically enrolled though they had the option to opt out. The intervention appears to have slowed the rate of inpatient admissions and mental health hospital days among enrollees, improved client satisfaction with some aspects of care delivery (for example, shorter wait times for routine care appointments), and improved care coordination for clients. While the details of the intervention would need to be adapted to each state organizational context, the approach appears relevant to other states. Further, the focus on integration addresses an important area of long-standing interest and provides evidence that care could potentially be improved by centralizing attention to diverse components of care that are often independently provided.

Comprehensive Neuroscience's (CNS) Medical Risk Management Project attempted to improve the quality of care for a large number of people with a low-cost intervention that distributed information to primary care providers on the services that their schizophrenic patients used in the prior year. Because they had a strong and well-implemented design (randomly assigned treatment and control groups), a rigorous impact evaluation could be conducted, indicating no detectable effects on outcomes. The project team experienced a variety of operational problems which probably contributed to the absence of effects (for example, delays in tracking patients and providers, patients without a medical home, limitations in communication with providers); importantly, the team worked hard to address these limitations as they arose which may ultimately influence the scope of the intervention and lead to more promising outcomes. The results suggest that providing information to providers on the care used by their patients is not effective alone and CNS intends to use this insight to strengthen the intervention in the future. This project illustrates 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. 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**.**

WHILE OUTCOMES CANNOT BE ASSESSED, THE OTHER INTERVENTIONS ALSO GENERATED IMPORTANT INSIGHTS ON CHANGING CARE PROCESSES

- The Johns Hopkins intervention aimed to use case management within a managed care plan and better communications across sectors of the system to improve care coordination for adult Medicaid beneficiaries with a history of substance abuse and high health care costs, with a focus on improved access to services. Results suggest that use of such services may have increased in the intervention group relative to the

comparison group, though there were design limitations. Since the intervention sought to affect access to these services, it is regrettable that the context (unavoidably small numbers of eligible patients) did not allow a more rigorous test of impacts on process and outcome measures.

- McKesson's project added an intensive in-person group educational component to standard disease management for aged, blind, or disabled Medicaid clients with diabetes. The results, especially in Oregon, suggest that group educational sessions might have promise to increase patient self-efficacy and hemoglobin A1c testing beyond that of standard disease management. Scale, however, appears to be an issue in this intervention, as McKesson reached far fewer patients than it intended. Any other organization seeking to replicate this intervention should study the reasons for low enrollment carefully because reaching a larger share of potentially eligible people is likely crucial to generating meaningful effects on patient outcomes.

- DC's medical house call program aims to provide a medical home to people who otherwise cannot physically travel to a physician's office. A Medicaid waiver option for elderly and disabled clients, the program coordinates care for chronically ill individuals who prefer to remain at home. The program targeted an important high-cost population in an innovative way. Those in the intervention had care patterns consistent with what one would desire—higher use of personal care assistants, durable medical equipment, and medications as well as fewer nursing home admissions and nursing home days. However, the comparison group used to estimate program impacts was not a strong one and the program only collected data during the intervention period. These are serious methodological weaknesses that limit what can be learned about outcomes. However the intervention appears an interesting one that could have promise, so it could warrant more rigorous testing and study in other locations.

- Memorial's health navigator intervention added a social worker to its existing disease management program to help patients understand the health and non-health services available to them. The health navigator's role was to conduct patient home visits, complete assessments, and develop care plans. The health navigator completed assessments with all patients she visited and completed a care plan with a high proportion of them. Treatment group members had nearly twice as many contacts with either the health navigator or their primary disease managers compared with control group members. All these process measures are considered, by Memorial, as prerequisites for improving longer-term outcomes. One of Memorial's early challenges included defining a clear role for the health navigator and integrating her with existing disease management staff. Standardization of these roles is critical for successful replication.

- CareOregon provided team-based case management to patients with various chronic medical conditions with the intent of varying the intensity of the intervention based on client needs to maximize impact on utilization and costs. For example, some clients could be referred to mental health services and others linked to community resources. Setting standards for such a flexible intervention is difficult. While the intervention was not standardized at the outset of MVP, the project team made great

strides over the course of the intervention to define roles for intervention staff and standardize protocols of care. CareOregon found that clearly defined staff roles and protocols for staff improved delivery of the intervention. Because the intervention changed over time and also was not paired to a similar comparison population, it is not possible to gauge the potential of the intervention to generate the savings it hoped.

- Partnership's provider-based intervention aimed to improve patient quality of care for patients with diabetes and other comorbidities. Partnership made a conscious decision to work with specific practices with which it has long-standing arrangements and to give these practices flexibility to make changes as they saw fit. Partnership found that involving a team from each office promoted ownership and helped office staff better understand the intervention; however the design did not generate sufficiently detailed information on the intervention or credible estimates of its effects. Partnership also had a parallel program for diabetes that was patient-focused. Their experience helped generate insight on the importance of coordinating intervention practices with the activities of existing interventions to avoid duplication.

- UCSD added a depression treatment program to a diabetes disease management program at three community clinics; both programs have been studied independently, but never together. Regrettably, the project experienced delays in start up related to the need to line up funding and then subsequent problems in implementation related to obtaining funding for care for uninsured patients and operational challenges (including coordination between clinic staff and the depression care manager). They also found lower than expected prevalence of depression in the target population. Despite these factors, once the depression care manager began working with patients the intervention was intensive, suggesting that the intervention could hold promise if it could eventually be scaled and implemented long enough.

- The Managed Health Services project addressed a policy question important to many Medicaid policymakers: Can we identify clients in need of case management services more efficiently than through resource-intensive health risk assessments? After reviewing two different risk assessment tools (one based on patient self-reports and the other on claims data), MHS believes that the claims-based tool coupled with other data offers an opportunity to identify clients in need of case management more efficiently than is possible with self-reported data. However the design of the study limits the confidence in such conclusions. Because the issues addressed are important, it could be valuable to study the question further with a more focused design accounting for how case management decisions are made.

MOST GRANTEES HAVE CONTINUED THEIR INTERVENTIONS AFTER MVP FORMALLY ENDED

In April 2007, most of the grantees (seven of nine) were continuing their interventions even though MVP had formally ended and each of them appeared to have fairly good prospects for longer-term sustainability. An eighth intervention (Hopkins) was not continued per se, but several of its activities were institutionalized into standard program operations. The ninth intervention (CNS) was funded by the state of Missouri to continue in a modified form. As with

implementation, support from top leadership was critical for sustainability. Funding is an important issue for interventions' sustainability, particularly those that hire dedicated staff. The availability of such funding obviously also is influenced by leadership commitment. Most grantees said the business case (return on investment) was important but only two grantees planned to measure it following the completion of MVP. In several cases, grantees viewed the business case as resting less on short-term gains than on long-term impact on cost or on the organization's financial strength.

This suggests that either the grantees are sufficiently convinced there is a business case for their interventions going forward despite the lack of empirical evidence, or that the business case is not as important as they report. Most of these interventions do not appear to be very resource-intensive. Organizations may feel that spending such modest sums does not justify the need for rigorous evidence of effectiveness, particularly if it promotes innovation and demonstrates the sponsor's efforts to help patients and improve care or if it generates goodwill among invested staff. Because of the way organizations operate, this could constitute a sufficient business case for leadership at sponsor organizations.

MANY INTERVENTIONS APPEAR REPLICABLE BUT MOST REQUIRE FURTHER STUDY TO DETERMINE THE VALUE OF DOING SO

The replicability of an intervention depends on: (1) the clarity and specificity of intervention activities (do we know what the intervention is in enough detail that another organization could repeat it); and (2) its organizational and environmental context (how unique is its the setting in which the program took place and how applicable is it to other settings). In addition, whether or not it makes sense to replicate an intervention depends on what is known about its value (are there potential benefits to organizations implementing it and to their patients or providers in terms of favorable impacts on quality, patient outcomes or cost in the short- or long-term).

Most grantees thought that their interventions were replicable. We tend to agree. By and large, the interventions appear relatively "generic" efforts that could work in many, though not necessarily all, environments, with some modest tailoring to fit particular organizational features. Most interventions appear to have sufficient documentation to support efforts at replication. However, in a few cases, replication would be difficult because the interventions were not well documented and standardized protocols were not developed.

The more challenging issue involves whether it makes sense to encourage replication. The grantees generally thought that doing so would be valuable even if they were not able to show empirical evidence on outcomes or business returns. Because these are relatively low-cost interventions, there may be organizational returns to doing so, as noted previously. However, MVP was initiated as a vehicle for identifying ways to improve care for adult Medicaid beneficiaries with multiple chronic conditions. The Washington State intervention had relatively strong evidence of effectiveness; the CNS intervention did not. Some others showed promise in terms of potentially improved processes of care but further testing would be required to judge their effects on outcomes.

GRANTEES VALUED THE SUPPORT OF MVP AND CHCS

Grantees valued the support provided by CHCS and the MVP structure as they pursued their interventions. The structure provided by MVP (including the framework for reporting measures and the role of CHCS in keeping grantees on target) was the most valued area of support. Participants also found the meetings useful and the seed money important in allowing them to conduct their interventions and garner internal support. Association with a project like MVP also added prestige to their efforts. They suggested, however, that communication and support between meetings could have been stronger. Grantees with less experience seemed particularly interested in ongoing general support, whereas others focused more on specific areas for which they sought technical support. The majority said Kaiser Permanente sponsorship added to the value they gained from MVP. (Others had no opinion or were not aware of the sponsor). While Kaiser Permanente was less visible to grantees than CHCS, grantees saw Kaiser as opening doors to potential opportunities and lending prestige to the effort.

CONCLUSIONS

MVP was formed to help expand knowledge of ways to improve care for adult Medicaid beneficiaries with multiple chronic conditions. The program succeeded in generating interest among states and health plans in developing such interventions and in building on that interest to select 10 interventions for implementation. MVP also was successful in implementation. Though progress was slower than many grantees initially hoped, each grantee was able to implement its intervention and eight had at least one year of operational experience before MVP ended. In most cases, grantees continued their interventions after the formal program ended. Further, grantees still appeared enthusiastic about their work at the end of the program and positive about the contribution made by CHCS and the MVP program structure to their efforts.

MVP was much less successful in rigorous, empirical testing of the effectiveness of the interventions. The focus on logic models and measures succeeded in generating quantitative measures on a few critical process and outcome measures. However, only two of the interventions had a sufficiently strong comparison group methodology and enough participants to support formal testing of impacts. This outcome is not surprising, given the limited resources CHCS had available to support data collection for rigorous evaluation and the limited resources available to many of the grantees.

Given the impetus behind MVP, one key question remains: What does the program contribute to our understanding on how to improve care for its target population—Medicaid beneficiaries with multiple chronic conditions? We believe the contribution has been positive on several dimensions.

First, from a process perspective, MVP demonstrated the value of using logic models and process measures to help grantees be more clear about their interventions and what they hoped to achieve. Even though MVP did not generate solid evidence of effects, the descriptive information supported by this approach will make it easier for others to learn from the MVP experience.

Second, MVP generated evidence suggesting that well-conceived efforts to better integrate care across the range of services (primary care, mental health, substance abuse, and long-term care) required by beneficiaries with multiple chronic conditions, difficult though that may be, have promise. This promise is best reflected in the Washington State Medicaid Integration Partnership but also in the Johns Hopkins care management model. Each of these aimed to modify the way benefits were used and to better integrate care across sectors of services. The interventions also were structured so that financial incentives reinforced the goals of health care services integration.

Third, the findings show that it is not just what the intervention is that matters, but also that the *intensity* of the intervention is likely to be important to improving outcomes for patients with multiple chronic illnesses. This is best illustrated by the challenges CNS faced in generating strong positive effects for what in effect was a relatively low-intensity intervention. However, other grantees also found it challenging to implement their interventions (CareOregon) or to intervene in a way that reflected a sufficient change from standard practice that it was reasonable to expect changes in outcomes (Partnership Health Plan).

Fourth, MVP brings to light what could be some difficult or even insurmountable challenges in building a strong empirical evidence base on ways to improve care for adult Medicaid beneficiaries with multiple chronic illnesses. As MVP grantees found, many relevant subgroups are, by definition, small in number. Further, existing administrative data may not enable sponsors to identify this group reliably. Because costs for these groups tend to be high and numbers small, the power with which interventions can be tested will be constrained inherently by the chance that a single "outlier" patient with a particularly poor and costly outcome may drive the estimates of effects on costs. Utilization-based measures are less sensitive to this constraint but the shift in focus away from resource considerations could make it harder to assess the business case for interventions.

RECOMMENDATIONS

We believe that these conclusions highlight at least three recommendations for future attention pertaining to improving care for adult Medicaid beneficiaries with multiple chronic conditions.

First, favor multi-faceted yet well-targeted interventions with sufficient intensity to affect outcomes. The populations targeted by MVP interventions have complex conditions and multiple needs. These patients interface with the health care system in a variety of ways. CHCS may not want to promote a particular model of care (such as the chronic care model), but it would seem critical to focus on interventions that have the potential to drive change in ways that align processes to reinforce improvements in care and outcomes. Such an orientation seemed to be best reflected in the Washington State intervention and it is intriguing that this program provided the most concrete evidence.

Second, put greater emphasis on learning and design before testing. While CHCS scanned the environment prior to implementing MVP, the program was not conceived in a proscriptive fashion and allowed grantees substantial flexibility to develop their own

interventions for testing. To different degrees, each of the grantees found they needed to spend substantial time defining their intervention more clearly before they could proceed. Often, changes in care processes were being implemented for the first time or conceived without benefit from existing experience elsewhere (if it existed). Diversity also limited what grantees could learn from one another or others could learn by examining the collective experience. Given the challenges illustrated by MVP in assessing the effects of interventions, we believe it valuable to spend substantially more time exploring potential interventions for their promise so that efforts and tests could be focused on those that are most promising. Rapid cycle methods are well-suited toward developing testable models, especially if complemented by a rigorous and comprehensive review of existing experience in improving care for adults with chronic illness.

Third, consider multi-site tests of the most promising interventions and convince funders to invest the resources needed for rigorous evaluation. Creating change through small-scale interventions that are narrowly focused geographically or defined such that they reach small numbers of people, however sick they are, makes it hard to test interventions. If there are particularly promising interventions, it could be strategically of value to focus resources on bringing these to scale for rigorous testing. For example, for a chronically ill population with average annual hospitalization rate of one per patient, detecting a 15 percent difference in hospitalizations would require a treatment group of 550 or more patients (who participate in the intervention) with a randomly assigned control group of equal size. By standardizing intervention strategy (even with allowable customization by site), one can better pool results to better capture their impact. Beyond the numbers, multi-site tests also add insight on the replicability of an intervention across sites, especially if there is sufficient data to assess effectiveness at the site level as well as across sites.

I. THE MEDICAID VALUE PROGRAM: INTRODUCTION AND OVERVIEW

A. BACKGROUND

The Center for Health Care Strategies (CHCS) created the Medicaid Value Program: Health Supports for Consumers with Chronic Conditions (MVP) to better understand how effectively structured interventions might improve care for adult Medicaid beneficiaries with multiple chronic conditions. The organizations selected for participation in MVP were charged with developing, measuring, and disseminating successful models of care delivery for this population. MVP was a $2.8 million initiative funded through a two-and-a-half-year grant from Kaiser Permanente Community Benefit, with additional funding from the Robert Wood Johnson Foundation. Based on a competitive process, Mathematica Policy Research, Inc. (MPR) was selected to evaluate MVP for CHCS.

The impetus for MVP was straightforward: Although Medicaid enrollees with multiple chronic conditions account for a disproportionate amount of Medicaid spending (Bella et al. 2005), their needs often are not met by existing delivery systems (Wagner et al. 2001). Moreover, the number of Medicaid patients with comorbidities has increased over time (Wu and Green 2000), and these patients typically are the most expensive. Interventions that promote better management of patients with chronic conditions have the potential to improve patients' health and quality of life while substantially decreasing health care costs.

The four broad objectives of MVP were as follows:[1]

1. Identify and strengthen best practices in care delivery, management, and evidence-based practices for consumers with multiple chronic conditions.
2. Test and validate the best practices to help build the business case for quality, and align financing accordingly.
3. Provide technical assistance and training to those implementing improvements in how care for consumers with multiple chronic conditions is delivered, integrated, received, measured and/or financed.
4. Promote the replication of these best practices and further collaboration among stakeholders in the Medicaid arena, including states, health plans, providers, consumer organizations, and Medicare.

[1] These objectives were laid out in a CHCS presentation during the prospective applicant conference call, May 2005.

B. SELECTION PROCESS AND TIME FRAME

In May 2005, CHCS issued a call for proposals for MVP, with proposals due in mid-June. (See Table I.1 for a timeline of MVP activities.) Applicants from 22 different states submitted proposals and included a diverse array of organizations, such as health plans, state Medicaid agencies, community health centers, hospitals, academic institutions, and private companies. Moreover, the proposed pilot interventions and associated target populations differed widely across applicants. An expert panel of 16 members, including representatives from health plans and related organizations, health systems, academic institutions, and government agencies, then reviewed proposals. To facilitate panelists' review, CHCS staff summarized each of the proposals; MPR also shared its perspective on how well the effects of the intervention could be evaluated, since such evaluation was a critical interest of the program.

TABLE I.1

TIMELINE OF MVP ACTIVITIES

Activity	Date
Call for proposals released	May 3, 2005
Prospective applicant call	May 11, 2005
Proposals submitted	June 17, 2005
MVP expert panel meeting to select grantees	July 19–20, 2005
MVP grant funding begins	September 2005
First collaborative meeting (Chicago)	October 2005
Submission of first quarterly reports	November 2005 (quarterly thereafter)
Second collaborative meeting (Philadelphia)	May 2006
Third collaborative meeting (San Francisco)	April 2007
MVP grant funding ends	June 2007[a]

[a]Originally scheduled to end in January 2007; Kaiser Permanente approved an extension to provide additional time for grantees to generate information on the effects of the interventions, many of which had a slower than originally anticipated start.

In mid-July 2005, CHCS convened a one-and-a-half-day meeting of its MVP expert panel to review proposals and select grantees based on intervention design, reach, and scope. CHCS staff and the expert panel agreed that the state Medicaid agency should be part of the team for each MVP project, and as such should provide any necessary data to the lead organization. A subset of at least 3 (of the 16) panel members was asked to prepare a thorough review of each

proposal's team composition, data validity and evaluation potential, and overall impact.[2] Additionally, these panel members were asked to summarize each proposal and provide feedback to the rest of the panel during the meeting. All panel members then discussed and asked questions about the details of each proposal.

The expert panel ultimately selected 10 organizations, or "innovation teams," for funding (Table I.2). Funding for about half of these organizations was contingent on certain criteria, some of which were more substantial than others (for example, acquiring funding for the intervention itself versus ensuring that the state Medicaid agency was on board with the intervention). Ultimately, all criteria were met and all 10 were funded. Each of the selected teams received $50,000 to offset costs associated with data collection and analysis, as well as travel to participate in MVP meetings. (Each grantee's intervention itself had to be funded through sources other than MVP.) The first payment was provided to teams in September 2005, and the first meeting of MVP grantees was convened in October 2005.

The original timeline for MVP was approximately 17 months (September 2005 through January 2007). However, several teams took longer than expected to begin their interventions. In addition, most teams faced slow enrollment or initially had difficulty collecting data on measures. They therefore first reported data to CHCS in April 2006 instead of January 2006, as originally planned.[3] For these reasons, Kaiser Permanente agreed in spring 2006 to extend the evaluation for an additional six months (through July 2007).

The extension was viewed as providing teams the best chance to not just implement their interventions but also to measure the effects of them, a critical factor in considering replication and sustainability. Specifically, the extension allowed a longer follow-up period over which we could track grantees' measures and allow more time for any potential effects of each intervention to be realized. A longer time period was especially crucial for interventions where patient outreach was a major component. Successful patient engagement can take three to six months, delaying program impacts in the intervention period. The extension also allowed the teams using rolling enrollment to enroll additional patients into their interventions, increasing the size of their intervention groups and the probability of an impact on patient outcomes.

While the extension was designed solely to allow more time, it had other benefits. With it, MPR was able to conduct another round of interviews and continue informal communications with grantees toward the end of the implementation process, thus enabling us to document implementation activities and challenges more fully. With this additional time, we could also be

[2] Prior to this meeting, MPR staff prepared a one-page summary of the evaluability of each of the 18 proposed interventions. The four main areas used for assessing each proposed project's evaluability were a well-defined target population, a clear and logical intervention, clear and appropriate outcome measures, and the presence of an appropriate comparison (or control) group. Based on each of these areas, we rated applicants' evaluability as high, medium+, medium, or low. Our ratings were independent of any analysis of the potential value of the intervention (for example, evidence of effectiveness, scope of effort, policy importance), given that such analysis would be provided by the expert panel. Over the course of MVP, we updated our evaluability rating of each grantee.

[3] Two grantees did not report quantitative data at that time.

TABLE I.2

MVP GRANTEES' TARGET POPULATIONS AND PILOT INTERVENTIONS

Grantee (Organization Type)	Target Patient Population	Pilot Intervention
CareOregon (health plan)	Costliest patients (top 3-5 percent)	Team-based case management using health care guides (RNs) and care coordination assistants
Comprehensive Neuroscience (health information firm)	Patients with schizophrenia	Health utilization summaries provided to each patient's physicians and case manager
DC Department of Health (state Medicaid agency)	Elderly patients in home setting at risk for nursing home placement	Medical house-call program
Johns Hopkins/ Priority Partners (health plan)	Patients with multiple chronic conditions and substance abuse	Team-based care management, including RN care managers and substance abuse care managers
Managed Health Services (health plan)	Supplemental Security Income clients	Comparison of two risk-assessment instruments used in making a decision on case management placement
Memorial Healthcare System (hospital system)	Patients with two or more chronic conditions, including at least one of following: asthma, congestive heart failure, diabetes, and hypertension	Health navigator added to an existing disease management program
McKesson Health Solutions (disease management vendor)	Diabetic patients (including those with cardiovascular disease)	Group-setting diabetes education program added to an existing disease management program
Partnership Health Plan (health plan)	Diabetics with hypertension, cardiovascular disease, or depression	PHASE program including drug interventions, control of risk factors, and lifestyle changes
University of California, San Diego (university)	Diabetic patients with depression participating in a diabetes disease management program	Depression care manager (IMPACT)
Washington State DSHS (state Medicaid agency)	Categorically needy aged, blind, or disabled patients	Integration of primary care, MH/SA, and long-term care services under one contract with a single health plan

DC = District of Columbia; DSHS = Department of Social and Health Services; IMPACT = Improving Mood Promoting Access to Collaborative Treatment; MH/SA = mental health/substance abuse; PHASE = Preventing Heart Attacks and Strokes Everyday; RN = registered nurse.

more confident that any challenges observed reflected issues with the intervention itself rather than start-up problems that are normally resolved quickly. This consideration was especially important for those grantees whose interventions progressed more slowly. Finally, the extension allowed time to resolve issues involving data and information technology, which thwarted the ability of a couple of teams to initially report measures.

C. PURPOSE AND ORGANIZATION OF THIS REPORT

The purpose of this report is to provide CHCS with a final assessment of MVP. The report is organized into two parts:

Part 1 of the report provides information on MVP as a whole, and includes several chapters. Specifically, Chapter II describes MPR's approach to the MVP evaluation and discusses methods used and limitations of this approach. Chapter III provides general background information on MVP grantees and characterizes their interventions. Chapter IV looks across all MVP grantees to provide a cross-cutting assessment of their implementation experiences and the challenges associated with implementation. Chapter V provides an assessment of intervention's process and outcome measures (based on data provided by grantees). Chapter VI examines the factors that contribute to intervention sustainability and replicability. Chapter VII assesses how CHCS's direct support and technical assistance affected the grantees' interventions, and the value of the MVP collaborative structure. Conclusions and policy recommendations are included in Chapter VIII.

Part 2 of the report provides a detailed case study (and associated logic model) for each MVP intervention, drawing on the results of our qualitative and quantitative analyses.

II. EVALUATION APPROACH: RESEARCH QUESTIONS, METHODS, AND LIMITATIONS

This chapter describes MPR's approach to the evaluation of MVP. We first describe the primary research questions addressed by this evaluation. We then describe our methods and associated data sources, including our qualitative and quantitative analyses. Finally, we discuss the limitations of this evaluation.

A. RESEARCH QUESTIONS FOR EVALUATION

We answer five research questions in our evaluation of MVP, as described in Table II.1. We answer all research questions on two bases: (1) an individual basis through the development of a case study and logic model for each intervention, and (2) a cross-cutting basis in which we describe findings and themes across all MVP grantees as a whole. The data sources for answering these research questions include both qualitative data (from interviews, correspondence with grantees and CHCS, and other documents) and quantitative data (process and outcome measures as reported by grantees in their quarterly reports to CHCS), as described in more detail below.

TABLE II.1

RESEARCH QUESTIONS FOR THE MVP EVALUATION

Research Question		Data Source(s)
1.	What interventions did MVP grantees implement, and what were they trying to achieve through these interventions?	Grantee interviews and documents Correspondence with teams and CHCS
2.	To what extent were MVP grantees successful in implementation? What factors challenged or facilitated implementation?	Grantee interviews Data from quarterly reports
3.	Did interventions achieve the outcomes sought?	Grantee interviews Data from quarterly reports
4.	What are the reasons that outcomes were achieved or not, and what factors could have made a difference?	Grantee interviews and documents
5.	How generalizable is the experience of MVP grantees?	Grantee interviews Correspondence with grantees and CHCS

B. METHODS AND DATA SOURCES

The evaluation employs both qualitative and quantitative analyses to develop as complete a picture as possible of each intervention and MVP as a whole.

1. Qualitative Analysis

To assess the implementation of MVP interventions, we analyzed qualitative information from two rounds of structured interviews with a selected set of respondents from each grantee and regular contact (such as conference calls and e-mail correspondence) with grantees and related stakeholders. The interviews conducted in preparation for this report generally included the following respondents:

- MVP lead contact or project director for each team
- Provider, case manager, or other staff member directly responsible for implementing intervention
- Other core MVP staff (as relevant)
- Senior executive from lead organization (such as the chief executive officer, the chief operating officer, or the medical director)
- State Medicaid representative (as relevant)

Each round of interviews had a slightly different purpose (Table II.2). The purpose of the first round of interviews was to gather background information on participating organizations and their roles in and incentives for participation, to learn about the structure and details of the intervention, to gain insight into potential challenges and core system strengths, and to find out grantees' expectations of intervention impacts. Depending on each respondent's background, the first round of interviews also asked about background and history, as well as contextual and environmental factors that might affect the intervention.

The purpose of the second round of interviews was to update our understanding of each intervention; to identify where grantees were at this stage and why; to learn about successes and barriers from the perspective of the grantees; to understand factors inhibiting and facilitating success and their implications for sustainability and/or replicability; and to gauge CHCS's contribution to the interventions, including the value of the collaboration to the grantee. Depending on each respondent's background, the second round of interviews also asked about recent changes in organizational or environmental factors that could have affected the intervention.

On average, we conducted four first-round interviews per grantee team and three second round interviews per grantee team. First-round interviews generally lasted 60 to 90 minutes, while second-round interviews lasted 30 to 60 minutes. A detailed table of round 1 and 2 interviews by grantee team is displayed in Appendix A. The table lists the respondents for each interview, as well as the interview date and interview length.

TABLE II.2

ROUND 1 AND ROUND 2 INTERVIEWS, QUALITATIVE ANALYSIS

Round	Persons Interviewed from Each Grantee Team[a]	Interview Focus Areas for Interview[b]
Round 1	• MVP lead contact or project director • Provider or case manager directly involved with implementing intervention • Other core staff (as relevant) • Senior executive from lead organization • State Medicaid representative (as relevant)	• Organizational background • Context and environment • Primary partners/stakeholders; their role and incentive to participate • Detailed information on intervention • Detailed information on how intervention differs from existing disease management (if appropriate) • Implementation challenges • Future plans
Round 2	• MVP lead contact or project director • Provider or case manager directly involved with implementing intervention • Other core staff (as relevant) • Senior executive from lead organization • State Medicaid representative (as relevant)	• Changes in context/environment • Changes in intervention over time and why • Implementation challenges • Future plans for intervention • Prospects for sustainability, replicability • Lessons learned

[a]Persons interviewed for each team varied depending on grantee and intervention being implemented.
[b]Focus areas varied by respondent type.

The qualitative analysis provides detailed information on operational issues and contextual factors affecting implementation. Moreover, consistent with the MVP expert panel's desire to understand the "black box" of each intervention—that is, the specifics of what is really taking place—this analysis provides a thorough understanding of how each approach goes about improving care for people with multiple chronic conditions. We also used the information from the qualitative analysis to develop cross-cutting themes about implementation issues, challenges, and successes for MVP as a whole.

We used the results of the qualitative analysis to develop a case study for each MVP grantee's intervention.[1] (See Part 2 of this report for the case studies.) Focusing on process and implementation issues, each case study includes a discussion of organizational and contextual factors, program intervention details, process and outcome measures, and intervention challenges. For each case, we also developed an associated logic model. As documented extensively in the literature, logic models show the progression from a starting point with various inputs, to activities and processes that generate outputs and have short-term effects, to intermediate- and long-term effects and outcomes for individuals and society (W.K. Kellogg Foundation 2004). The logic models help document the flow of intervention activities, while highlighting any important gaps in the underlying logic of the intervention.

2. Quantitative Analysis

We analyzed quantitative information in the form of process and outcome measures from grantees' quarterly reports and final data reports to CHCS. This descriptive assessment and analysis helps to address the second and third research questions: To what extent were MVP grantees successful in implementation? And did interventions achieve the outcomes sought? In each case study, we include an analysis of data reported by each grantee. A cross-cutting analysis of process and outcome measures is included in Chapter V.

Our quantitative assessment of outcomes includes examination of either trends over time (pre-intervention versus intervention period) and/or differences between treatment and comparison groups (where applicable) over the entire intervention period. While MPR examined these differences, it is worth noting that most grantees had neither the sample sizes needed to detect even fairly sizeable impacts nor the resources to adequately test whether or not differences were statistically different from one another.[2] Nonetheless, this analysis is useful for several reasons. First, examination of process measures can help determine whether implementation occurred as anticipated. Second, differences in outcome measures between treatment and comparison groups (or in trends, for those sites without a comparison group) in anticipated directions may indicate the potential for favorable results in a later period, possibly suggesting further study. Finally, the evaluation of process and outcome measures in combination helps us assess the potential promise of an intervention.

A critical caveat is that the funding to support the evaluation was not sufficient to allow MPR to collect and analyze primary data. As an alternative, we worked with individual grantees to clarify their evaluation designs and how success was to be measured. We also worked with them to develop logic models for their interventions and to define both process and outcome measures of success that were realistic to examine within the time period of the evaluation. We also encouraged them to collect data (before and after the intervention) on a comparison

[1] The one exception is Managed Health Services, which did not have an intervention but instead compared two different patient risk-assessment tools. Therefore, we have included a summary rather than a complete case study on this project in Part 2 of the report.

[2] Before the final MVP collaborative meeting, we discussed statistical testing with grantees who we believed might have enough data to warrant such tests.

population and, where appropriate, to randomize eligible individuals to treatment or control groups. However, our ability to use these data was constrained to the extent that grantees experienced problems (discussed later) in developing strong designs or collecting appropriate data. In many cases, the data available provide a descriptive profile of whether patients in the interventions improved. However, in many cases appropriate measures from the treatment and comparison groups were not sufficiently robust to provide evidence that any changes were due to the intervention.

C. LIMITATIONS

While the resources and time frame of MVP did not allow us to conduct a comprehensive impact evaluation to thoroughly assess change as a result of the interventions, we were able to work closely with grantees to generate insights on the outcomes that occurred as part of the MVP projects. Impact evaluation requires well-measured outcomes and carefully constructed comparison groups over time frames sufficient for true impacts to be generated in those outcomes. These conditions are necessary to determine not only whether given measures changed but also whether any changes could be attributed to the intervention rather than other factors. In contrast, our outcomes analysis reports observed changes over time for participants (and, in most cases, comparison groups) in the demonstrations, but the changes could not be fully attributed to the intervention itself because the intervention design and available data were not powerful enough to control for all of the other things that could explain these effects. In addition, most projects involved relatively short periods over which to observe possible changes in outcomes, and involved relatively small numbers of patients, which limited the ability to detect differences between treatment and comparison groups.

Nonetheless, these findings can help identify potential results of MVP interventions upon which to judge which may be sufficiently promising to warrant future refinement and testing. Pairing the quantitative analysis with the qualitative data helps present a fuller picture of each intervention. For example, the logic model developed for each intervention provides important descriptive information on how the intervention was intended to work, and the case studies carefully document the context and implementation of each intervention, as well as operational issues associated with it.

III. BACKGROUND ON MVP GRANTEES

This chapter addresses the evaluation's first research question: What interventions did MVP grantees implement, and what were they trying to achieve through these interventions? To answer this question, we synthesized information from grantee interviews, program documents submitted over the course of the evaluation (beginning with grantees' initial proposals), and correspondence with grantees and CHCS. In this chapter, we provide an overview of grantees' interventions and ultimate goals, deferring to the case studies (Part 2 of the report) for specific details on each individual grantee.

A. BASIC CHARACTERISTICS OF MVP GRANTEES' INTERVENTIONS

1. Primary Intervention Goals

All MVP grantees shared the common goal of improving quality of care for patients with multiple chronic conditions. Many of the grantees sought to take steps to improve quality that would reduce unnecessary emergency room use or hospital admissions, and they included these as explicit intervention goals. Two of the interventions that focused on patients with mental health or substance abuse issues sought better access to appropriate services for patients. Two other programs were interested in directly improving patients' self-care skills or getting patients to make lifestyle changes. Nearly all grantees had the long-term goal of reducing overall medical costs for their target population as a consequence of improving quality of care. Table III.1 summarizes the grantees' goals at the onset of the interventions.

A common theme across all the MVP interventions was the way in which grantees approached care for patients with chronic conditions from an integrated perspective. Most of the interventions, some more subtly than others, sought to address not only patients' medical needs but also their psychosocial and mental health/substance abuse needs. The grantees recognized that care for Medicaid clients with chronic medical conditions often requires the integration of many different types of medical and non-medical services.

In addition, some interventions focused on the importance of managing patients' psychosocial needs either directly—with care management staff hired for that purpose (Memorial, CareOregon), or indirectly—through staff observation during in-person contacts (DC, McKesson). These interventions recognized the need to address these issues first before moving on to managing a patient's medical needs. One intervention also recognized the need to educate and support patients' caregivers, particularly those caring for frail elderly patients (DC). Interventions that integrated mental health or substance abuse needs with traditional medical care did so either directly—with staff hired for that purpose (UCSD), or as a part of a general care integration plan (Hopkins, Washington State). Some interventions integrated mental health care more subtly by integrating the use of a behavioral health screening tool, such as the PHQ-9 (Partnership, Memorial).

TABLE III.1

MVP GRANTEES' PRIMARY INTERVENTION GOALS

Grantee	Primary Intervention Goals
CareOregon	Reduce overall medical costs of costliest health plan enrollees
Comprehensive Neuroscience	Improve quality of patient care, reduce emergency room (ER) visits, lower hospital admissions, and reduce overall medical costs
DC Department of Health	Reduce ER and hospital visits, lower medical costs, and decrease incidence of nursing home placement
Johns Hopkins HealthCare	Increase use of mental health and substance abuse services among patients with these needs, lower use of unnecessary services, and reduce overall medical costs
Managed Health Services	Examine relationship between claims-based and self-reported health risk assessments used to determine case management placement decisions
Memorial Healthcare System	Reduce avoidable inpatient admissions and overall medical costs
McKesson Health Solutions	Improve self-care skills, lower ER and hospital visit rates, and reduce medical costs
Partnership Health Plan	Promote lifestyle changes, increase use of appropriate medications, increase incidence of lab testing and monitoring, and increase control of select clinical indicators
University of California, San Diego	Improve diabetes self-management and reduce depressive symptoms
Washington State DSHS	Improve patient quality of life, reduce ER use, lower hospital admissions, reduce overall medical costs, and increase patient satisfaction with care

2. Description of Intervention Characteristics

All 10 MVP interventions aimed to improve care for Medicaid beneficiaries with multiple chronic conditions, but they aimed to do so in a wide variety of ways. (For a summary of characteristics of individual interventions, including grantee organization type, intervention approach and activities, target population, population size, evaluation design, and start date, see Table III.2.)

Intervention Approach, Activities, and Staff. Grantees that sought to modify care did so in at least one of three ways: (1) by directly intervening with patients (and their families or unpaid caregivers), (2) by intervening with providers in ways that may modify how they care for patients, or (3) by making other changes in the delivery system or environment.

Among the 10 MVP grantees, most interventions were of the first type (patient-based). Six of the seven patient-based interventions targeted patients through case management and coordination (CareOregon; DC Department of Health; Johns Hopkins; Memorial Healthcare System; University of California, San Diego; and Washington State DSHS). The seventh used in-person patient education (McKesson Health Solutions). The two provider-based

TABLE III.2

BASIC CHARACTERISTICS OF MVP GRANTEES AND THEIR PILOT INTERVENTIONS

Grantee	Intervention Description	Focus	Target Patient Population	Approximate Size of Patient Population	Study Design	Intervention Start Date
CareOregon	Complex case management	Patient based	Costliest patients (top 3 to 5 percent)	330 intervention and 600 comparison	Comparison group	October 2005[a]
Comprehensive Neuroscience	Health utilization summaries	Provider based	Patients with schizophrenia (summaries sent to their primary care providers)	3,000 patients (2,271 treatment and 729 controls)	Randomly assigned treatment and control groups	May 2005
DC Dept. of Health	Medical house call program	Patient based	Elderly patients with chronic medical conditions in home setting	85 patients served and 650 comparison	Comparison group	January 2004[b]
Johns Hopkins HealthCare	Integrated case management	Patient based	Patients with multiple chronic conditions and substance abuse issues	100 intervention and 100 comparison[c]	Comparison group	October 2005
Managed Health Services	Comparison of two health risk assessment tools	System redesign	SSI clients enrolled in managed care program from April 2005 to November 2005	3,000 (2,800 with at least one assessment completed)	Not applicable	April 2005
Memorial Healthcare System	Health navigator (case management)	Patient based	Patients with 2 or more conditions, including at least asthma, CHF, diabetes, and hypertension	120 treatment and 40 controls[c]	Randomly assigned treatment and control groups	February 2006
McKesson Health Solutions	Group diabetes education sessions moderated by health educators	Patient based	Diabetic patients (including those with cardiovascular disease) in state using the McKesson disease management program	28 treatment completed all four sessions and 70 controls[d]	Randomly assigned treatment and control groups	Sessions in April and August 2006
Partnership Health Plan	Preventing Heart Attacks and Strokes Everyday (PHASE)	Provider based	Diabetics with hypertension, CVD, or depression	225 intervention and 1,650 comparison[c]	Comparison group clinics	January 2006
University of California, San Diego	Depression care manager (IMPACT)	Patient based	Diabetic patients with depression	100 patients in intervention group	Three intervention clinics (no comparison group)	July 2006
Washington State DSHS	Integration of primary, mental health, substance abuse, and long-term care	Patient based	Aged, blind, and disabled Medicaid patients (many of whom have mental health or substance abuse issues)	Average monthly caseload of 2,400, 15,000 comparison	Comparison group	January 2005

Note: All population sizes are as reported by grantees as of April 2007, when grantees last reported measures to CHCS.

[a]The first care coordination team was formed as of this date; the number of patients is as of November 2006.

[b]The program began in 1999, but the DC Medical Assistance Administration chose to evaluate it beginning in January 2004. About 500 clients make up the intervention group.

[c]These programs began with more patients but have lost some to disenrollment over time. See case studies in Part 2 of this report for more information.

[d]McKesson randomly assign about 80 patients to the treatment group, but two-thirds decided to not participate in the intervention.

CHF = Congestive Heart Failure; DSHS = Department of Social and Health Services; SSI = Supplemental Security Income.

interventions—those of Comprehensive Neuroscience (CNS) and Partnership Health Plan—targeted health care providers in an effort to improve the quality of patient care. The other grantee (Managed Health Services [MHS]) had a system redesign focus, making it unique among MVP projects.[1]

All the patient-based interventions involved case management but they differed in how they did so, the personnel used, and the kind of linkages they established with the patient's primary care provider. Only the DC intervention included physicians directly in its care management team; these physicians were primary care providers for intervention patients. The six other patient-based interventions used registered nurses or nonclinical case managers as liaisons between patients and their primary health care providers.

While some of the interventions represented new ways of structuring general case management, others built on existing disease management programs in ways that sought to enhance the effectiveness of care provided. Memorial's case manager functioned as a health navigator for subsets of patients with particular conditions. McKesson's intervention added group diabetes education programs as an overlay to low-level telephonic disease management for diabetic patients. UCSD sought to follow guidelines-based care for depression as part of managing diabetic patients. CNS employed a full-time advanced nurse practitioner to teach health care providers about the intervention and about how to use the intervention tools to improve patient quality of care.

Target Populations and Intervention Sizes. The interventions targeted a wide range of patient populations with multiple chronic medical conditions. Four of the programs targeted patients with **diabetes** and other comorbidities, including depression (McKesson, Memorial, Partnership, and UCSD). Another three focused on patients with **mental health or substance abuse issues** (CNS, Washington State, and Hopkins). Two grantees targeted **high-risk patients**, including those at risk for nursing home placement (DC) and those in immediate need of case management (CareOregon). The final grantee—MHS—also targeted patients in need of case management, but included patients of all risk levels in its sample in order to compare those with high- and low-risk health profiles.

The sizes of target populations sought at the start also differed considerably across the interventions. While three grantees had more than 2,000 members targeted for treatment (Washington State, CNS, and MHS), the majority had fewer than 200 patients targeted. One factor that explains the disparities in size of the intervention group across programs is whether the grantees had to recruit patients to participate. By and large, those interventions that required a patient recruitment phase had much lower expected enrollment than those that simply selected a patient population from claims data. Moreover, those involving intensive care coordination or case management also generally had smaller treatment groups, at least partially because of the staff needed to implement such intervention activities (with the exception of Washington State). Some interventions' target populations became even smaller when selection criteria and

[1] This grant, as explained before, examined two health risk assessment tools and was more methodological in focus. We excluded it from many of our analyses as the work was less directly focused on immediate ways to affect patient care outcomes.

participation rates yielded lower numbers of enrollees than originally anticipated, as discussed in the case studies (see Part 2 of this report).

Duration of Intervention. The time span over which grantees intervened with members of their target populations also varied considerably across grantees. A few of the interventions were designed to be short term, lasting three or fewer months (McKesson and CareOregon). The majority of the grantees, however, intervened with patients or providers for a longer time; in some cases, they began their interventions a year before the MVP grant period (Washington State and CNS).

State Medicaid Involvement. Though CHCS and the MVP expert panel wanted state Medicaid agencies to be a part of each grantee team, the degree and nature of involvement of state Medicaid agencies differed across MVP grantees. State Medicaid officials were involved with much of the design and implementation of five of the interventions (CNS, Hopkins, Washington State, McKesson, and DC). Two grantees were state contractors who had access to some Medicaid data for project evaluation but little direct input on their interventions from their state agencies (Memorial and MHS). Finally, three grantees had no (or almost no) formal interaction with their state Medicaid agencies (CareOregon, Partnership, and UCSD). Two of these three interventions were based in managed care organizations that contract with the Medicaid agency to provide services and were participating in MVP as part of their general work in carrying out those responsibilities. In general, grantees with little or no state involvement felt the lack of involvement did not hinder them in any way.

Study Design. Because CHCS was interested in using MVP to develop evidence on the effectiveness of the tested interventions, it encouraged grantees to use solid study designs in evaluating their efforts. CHCS also asked MPR to work with it and the grantees to strengthen these designs to the extent feasible. The resulting study designs differed from one another, but generally fell into two categories: (1) randomly assigned treatment and control groups, and (2) treatment group with a non-random comparison group. While CHCS and MPR encouraged all grantees to consider random assignment of their target populations for their evaluation designs, only three grantees used this approach (CNS, Memorial, and McKesson). All other grantees used a comparison group they selected to examine intervention impacts, such as total patient costs or hospitalization rates. The more closely the comparison group is related to the intervention in all dimensions, the more robust the design. However, grantees had to deal with operational constraints in selecting their comparison groups, so trade-offs were involved. The comparison groups ranged in complexity from one selected via a propensity scoring algorithm, resulting in a well-matched set of comparison patients (Washington State), to one comprised of patients with similar utilization who reside in neighboring counties (Hopkins), to a comparison group of practices not participating in the MVP intervention (Partnership).[2]

[2] The target population was so small in intervention counties chosen by Hopkins that there were no obvious alternatives to this design. In the last intervention (involving selected providers), it might have been possible to come up with a stronger design by randomizing practices or matching them. However, the grantee wanted to work with a core set of providers with whom it had an established relationship even if those providers were not typical of the average provider in the mix.

3. Elements of the Chronic Care Model Addressed

A useful way to categorize MVP intervention activities is by employing the components of the chronic care model (see Wagner, Austin, and von Korff 1996; Bodenheimer, Wagner, and Grumbach 2002). This model identifies the essential elements of a health care system that encourage high-quality chronic disease care. CHCS did not require that MVP grantees use the chronic care model because it wanted to give grantees flexibility and did not want to endorse any particular approach to intervention. The chronic care model, however, provides a useful set of categories with which to describe interventions (like those in MVP) designed to address concerns of patients with multiple chronic conditions. Because CHCS, many MVP grantees, and other potential users of our evaluation are familiar with the chronic care model, it is potentially valuable as another lens through which to examine the MVP interventions. The chronic care model includes the following dimensions:[3]

- ***Health care organization*** (involves supporting improvement at all levels of the organization, beginning with leadership; providing incentives based on quality of care; supporting effective improvement strategies aimed at system change; developing agreements that facilitate care coordination; and encouraging open and systematic handling of errors and quality problems to improve care)
- ***Decision support*** (involves embedding evidence-based guidelines in clinical practice; sharing guidelines with patients to encourage participation; using proven provider education methods; and integrating specialist expertise and primary care)
- ***Delivery system design*** (involves focusing on teams for chronic care; weaving evidenced-based guidelines into care; training in relevant skills and offering provider education; and ensuring regular followup by the care team)
- ***Community resources*** (involves encouraging patients to participate in community programs; forming partnerships with community organizations; and advocating policies to improve patient care)
- ***Self-management support*** (involves emphasizing patients' central role in managing their health; organizing resources to provide ongoing self-management support to patients; and encouraging creation of a personal care action plan that addresses personal barriers)
- ***Clinical information systems*** (involves providing timely reminders for providers and patients; identifying relevant subpopulations for proactive care; facilitating individual patient care planning; sharing information with patients and providers to coordinate care; and monitoring performance of practice team and system)

Table III.3 summarizes how the primary activities of each MVP intervention address each of the six areas of concern of the chronic care model. One intervention (Washington State)

[3] The dimensions and associated examples are taken from http://www.improvingchroniccare.org/change/model/components.html.

TABLE III.3

PRIMARY ACTIVITIES OF MVP INTERVENTIONS, USING CATEGORIES OF THE CHRONIC CARE MODEL

	Dimensions of the Chronic Care Model					
Grantee	Health Care Organization	Decision Support	Delivery System Redesign	Community Resources	Self-Management Support	Clinical Information Systems
CareOregon			Care coordination teams were utilized.	Links to community resources as needed by patient.	Self-management coaching as needed by patient.	Implementation of new information system.
Comprehensive Neuroscience		Providers received reports, monographs with evidence-based guidelines; CNS staff made telephone calls to alert providers of patient nonadherence to behavioral drugs.				Identified patients with poor adherence to behavioral drugs for referral to providers.
DC Dept. of Health		Staff offered caregiver and patient education.	Teams of physicians, nurses, and social workers made house calls.	Partnership formed with Washington Hospital Center.		
Johns Hopkins HealthCare	Members of integrated care team shared data.	Care managers receive training from psychiatric advisors on substance abuse and mental health topics.	Registered nurse care managers were trained in substance abuse issues.	Links to community resources as needed by patient.	Care managers provide patients with tools to better manage their conditions on their own.	Use of patient database to share information among providers.
Managed Health Services	Staff support improvement in case management placement decisions.					

TABLE III.3 *(continued)*

Grantee	Dimensions of the Chronic Care Model					
	Health Care Organization	Decision Support	Delivery System Redesign	Community Resources	Self-Management Support	Clinical Information Systems
Memorial Healthcare System			Health navigator added to existing disease management.	Links to community resources as needed by patient.	Health navigator provided self-management support.	
McKesson Health Solutions	Patients given monetary incentives to attend sessions.	Clinical self-care guidelines were used in sessions.	Group education sessions added to existing disease management.	Partnership formed with Oregon Health Sciences University.	Patients taught better self-management of diabetes, how to create action plans.	
Partnership Health Plan	Practices given incentives (small quality bonuses) to participate.	PHASE provides clinical guidance on laboratory testing and medication use via its primary goals.	Changes made to system at practice level to support PHASE elements.		Providers educated patients on self-management during office visits.	Practices' performance on key clinical measures monitored; registries developed.
University of California, San Diego		IMPACT and Project Dulce each had an existing evidence base.	Depression care manager added to clinics with existing diabetes disease management program.	Partnership formed with community health clinics; peer educator programs established.	Care manager taught patients how to better manage depression and improve self-care skills.	
Washington State DSHS	State contracted with Molina for care coordination (funded by various Medicaid divisions).	Specialty care and primary care for patients integrated.	Care coordination teams managed patient care with routine followup based on patients' risk profiles.	Snohomish County advisory committee provided input.	Care coordinators provided self-management support.	Care coordinators reminded patients to seek appropriate care based on IT system reminders.

addressed all six areas. As indicated in the table, each of the grantees' interventions included work on at least two dimensions of the chronic care model, with the exception of MHS whose intervention was fairly unique in its methodological focus. Most MVP grantees attempted some element of delivery system redesign (8 of 10) and linkage with community resources (7 of 10). Although few attempted a major overhaul of clinical information systems to support their interventions, one grantee (Partnership Health Plan) used existing technology to support monitoring and expanding it to include a registry useful to the effort. A review of grantees' activities suggested that they recognized the need to build interventions that address multiple components of the way care processes work, but were not seeking major reconfiguration of care delivery systems.

B. GRANTEE EVALUABILITY

Characteristics of the different interventions and the experiences of grantees affected what we could and could not learn from evaluating each intervention. To provide a sense for the evaluability of the interventions, MPR staff periodically reviewed them to see how they performed on the following criteria:

- The intervention was clearly defined and of a nature likely to have relevance to other organizations outside the MVP collaborative.
- The size of the intervention sample was large enough, and an appropriate comparison or control group made it possible to detect differences between treatment and control/comparison groups.
- The status of the implementation was such that the intervention was mature enough to generate outcomes within a year, given the short timeframe for the MVP evaluation.
- Process and outcome measures were available with which to assess the implementation and effectiveness of the intervention.

Based on these criteria, we classified grantees into one of three categories:

- ***Category 1.*** Those who had a high probability of generating (and ultimately providing) data likely to support a meaningful and reasonably rigorous assessment of outcomes. These grantees provide an opportunity to not only assess the model and implementation experience but also to potentially report some assessment of outcomes.
- ***Category 2.*** Those who had the potential to shed light on possible models and experience with implementation. However, any outcome data they generate are likely to be limited in some significant fashion (for example, no or weak comparison group, small sample sizes, limited measures, not timely, and so on).
- ***Category 3.*** Those whose time frame was sufficiently delayed or whose interventions were sufficiently ill-defined that we will probably not learn as much about either their

models or their outcomes as we could from other grantees. But, these programs still provide some insights on changing care processes.

In the chapters that follow on grantees' implementation experiences and factors related to intervention sustainability and replicability, we rely primarily on information provided by grantees classified in categories 1 and 2 (seven grantees in total) to draw cross-cutting conclusions. For the chapter where we assess process and outcome measures provided by each grantee, only the two grantees who we classified as Category 1 had strong enough designs and provided enough information for us to provide a complete assessment. For Category 2 grantees (five in total), we were more limited in our ability to assess impacts and draw conclusions from quantitative outcome measures data, but we could offer an assessment of implementation and an outcomes analysis. For Category 3 grantees, we were so limited by either issues with their evaluation designs or delays in implementation that we relied almost exclusively on qualitative information to assess their interventions.

IV. IMPLEMENTATION EXPERIENCE OF MVP GRANTEES

This chapter addresses the evaluation's second research question, applying it to the MVP grantees as a whole: To what extent were grantees successful in implementation? And what factors challenged or facilitated implementation? Whereas the case studies identify challenges and facilitators individually (see Part 2 of this report), this chapter provides a cross-cutting assessment for all MVP grantees, including a discussion of the role of environmental and organizational factors and their broad implications for MVP.

A. IMPLEMENTATION EXPERIENCE

1. Becoming Operational

Although some experienced implementation delays, all grantees operated an intervention for at least six months during MVP (and those who began later have plans to continue beyond June 2007). Getting these interventions operational was no small feat, especially for those who had to hire and train new staff (for example, CareOregon, Memorial, UCSD). Almost every grantee had to refine at least some of its intervention activities over time, due to patient, provider, or environmental factors. While some had to be more nimble than others in modifying their interventions, all appear to have tried to make changes to address particular problems or challenges, as must be done when implementing interventions for complex patient populations.

MVP grantees formed fairly strong partnerships with a range of organizations, and several grantee organizations attested to the importance of these relationships for the interventions and their longer-term sustainability. Partnering organizations included state Medicaid offices, community clinics, county mental health agencies, advocacy or consumer organizations, research universities, and other stakeholders. For example, UCSD's intervention drew on county mental health services to provide the medications and primary care physician visits for the uninsured and medically needy patients enrolled in the intervention. Memorial leveraged community resources, such as nutrition and transportation services to provide a more substantive intervention for its patients. Additionally, Missouri State Medicaid contributed to CNS's idea for its MRM intervention and supported CNS in the program's implementation.

Grantees varied on the extent to which they achieved standardization, and how early standardization was achieved. Seven grantees ultimately achieved some form of standardization to their intervention. Three of these grantees (UCSD, Partnership, and DC) adopted existing interventions, which had to be tailored to their specific populations, but had the advantage of being standardized prior to MVP. Two other grantees (Memorial, WMIP) were able to standardize their interventions early, though some adjustments were needed along the way. Two grantees (CareOregon, McKesson) achieved some standardization over the course of their interventions. CareOregon was frustrated early by lack of standardization—its case managers were lost without it—but was ultimately able to standardize its intervention and develop protocols for the case managers to use. McKesson standardized its workbook and has trained some staff in-house on group facilitation techniques.

2. Intervention Scale

MVP grantees collectively recruited or intervened with more than 5,500 patients, though this figure was heavily influenced by two large interventions that accounted for about 80 percent of the total (CNS, Washington State). CNS randomly assigned all eligible patients and examined outcomes for the whole population (regardless of provider participation in its intervention), while Washington State enrolled all eligible clients and required them to opt out of the intervention. Both intervention design strategies resulted in large numbers of people in their intervention groups.

Most grantees had fewer people in their interventions than anticipated at the start of MVP. This was true not only for interventions that required Medicaid beneficiaries to agree to participate before enrollment (CareOregon, McKesson, Memorial, UCSD), but also for population-based interventions (DC, Partnership). The number of people at interventions that

TABLE IV.1

MVP GRANTEES' PROPOSED AND ACTUAL INTERVENTION GROUP SIZES

Grantee	Intervention Group Size		Reasons for Discrepancy
	Proposed	Actual	
CareOregon	More than 3,000	About 330	Slower than anticipated standardization of case management protocols
Comprehensive Neuroscience	2,400	2,271	Error in random assignment caused treatment group to be slightly smaller than planned
Johns Hopkins HealthCare	About 120	About 120	No discrepancy
Managed Health Services	3,000	3,000	No discrepancy
McKesson	300 would complete sessions	28 completed sessions	Fewer eligible patients than anticipated and patient unwillingness to participate
Memorial Health System	About 250	About 120	Fewer patients eligible due to Medicaid reforms in target county
Partnership	About 2,000	About 200	Fewer participating clinics than anticipated
University of California, San Diego	200	About 100	Delayed start-up
DC Medical Assistance Administration	About 150	About 85 in house call program	Fewer than expected elderly clients enrolled in house call program
Washington State	Enrollment capped at 6,000	Average caseload of 2,400 patients per month	Large number of eligible clients opted out of this voluntary program

recruited beneficiaries to participate ranged from 28 to 330, though several grantees never expected to recruit a large number of patients because of staff capacity constraints of these newly designed pilot programs. For those grantees who had aspirations of larger intervention group sizes, reasons for the discrepancy varied. In some cases, the targeted geographic area did not contain a large enough group of patients with desired characteristics (such as the rural areas targeted by McKesson). In other cases, delays resulted in slower start-up and smaller intervention group sizes (CareOregon, UCSD).

Despite some interventions with small numbers of people, grantees generally had a fair amount of success reaching Medicaid beneficiaries. Moreover, grantees attempted to intervene with clients who have complex disease profiles and often have multiple social services needs at any given time; these clients are often the hardest to reach. Many of the patients eligible for MVP interventions may have also lacked the motivation to participate in the interventions (as noted by McKesson).

3. Reporting Process and Outcome Measures

As part of the MVP evaluation, all grantees were required to report process (where available) and outcome measures on a quarterly basis. These measures were meant to provide CHCS and the evaluation with information on how well grantees were implementing their interventions and whether or not the interventions had impacts on outcomes (particularly those identified in grantee logic models). Soon after grantees were chosen for MVP, CHCS and MPR worked with them individually to identify measures they could collect and provided technical assistance on how to complete program workbooks developed by CHCS and MPR. All of the grantees reported some data to CHCS, though some reported more regularly than others. Most grantees were able to report data on a fairly consistent basis (about once every quarter or so). In addition to their workbooks, some grantees also provided data from surveys they administered (McKesson, Washington State). Programs that did not report data as consistently faced either delays in implementation (UCSD) or resource constraints (CareOregon, DC). Based on interviews and other interactions with grantees, MVP appears to have been effective in getting grantees to think carefully about what their measures meant and in challenging them to be as rigorous as possible in examining the effects of their interventions. Grantees also noted that having to report data in their workbooks kept them focused on their interventions and highlighted the importance of monitoring their interventions continuously.

MVP grantees reported a wide range of process and outcome measures in their efforts to gauge whether the interventions achieved their goals (Table IV.2). In addition to outcome measures that are typically used to evaluate intervention effects, such as total medical costs or hospital admissions, CHCS and MPR also encouraged each grantee to collect several process measures to assess implementation. A focus on process measures provided insight into the potential effectiveness and promise of interventions, even where grantees did not have sufficient experience or data to judge short- or long-term outcomes.

At the outset of MVP, CHCS and MPR anticipated that grantees' abilities to collect process and outcome measures would be limited. Therefore, we encouraged them to focus on a small subset of measures (such as two to three each) that were both relevant to their interventions and

TABLE IV.2

PROCESS AND OUTCOME MEASURES REPORTED BY MVP GRANTEES

	Process Measures		Outcome Measures				
	Measure(s) of Case Manager or Provider Contacts, Proportion Managed, etc.[a]	Measure(s) of Proportion Receiving MH/SA Care[b]	Measure(s) of Clinical Quality of Care [c]	Physical or Mental Health Status Score(s)[d]	Measure(s) of ER or Hospital Visits; Nursing Home Admissions	Measure(s) of Medical Costs[e]	Measure(s) of Medication Costs
CareOregon	x			x	x	x	
Comprehensive Neuroscience	x				x	x	x
DC Dept of Health	x				x	x	x
Johns Hopkins HealthCare	x	x			x	x	
Managed Health Services	x			x	x		
McKesson Health Solutions	x		x		x		
Memorial Healthcare System	x			x	x		
Partnership Health Plan			x				
University of California San Diego	x	x		x			
Washington State DSHS		x			x	x	x

Source: Grantee reporting workbooks and correspondence with grantees.

[a]Also other process measures, such as education session attendance (McKesson); the percentage of patients who comply with referrals, have care plans, or had initial intake or depression screening performed (Memorial); or the proportion of patients with completed health risk assessments (Managed Health Services).

[b]Substance abuse treatment includes alcohol and other chemical dependency treatment. UCSD's measure reflects the proportion of patients selecting various depression treatment modes.

[c]For example, the proportion of patients with hemoglobin A1c (HgA1c) or low-density lipoprotein cholesterol (LDL-C) tests conducted, or the proportion of patients with controlled HgA1c or LDL-C (Partnership); and claims for appropriate drug utilization (McKesson and Partnership).

[d]Includes the health utilities index (CareOregon), the SF-12 mental component summary (Memorial), PHQ-9 survey scores (UCSD), and health risk assessment data (Managed Health Services).

[e]Includes total medical costs and costs for components of medical care such as hospital admissions.

ER = emergency room; MH/SA = mental health/substance abuse.

feasible to collect. In general, grantees followed this advice and collected six or seven measures, on average, with a fair mix of both process and outcome measures for about half the grantees.

a. Process Measures

Process measures indicate how well the intervention was able to identify and enroll the target population, and whether the intervention was implemented as expected and with what intensity. In general, intervention intensity depends on both the rate of staff contact with patients and the average length of program enrollment among patients in the intervention group. The most intensive interventions have both a high rate of patient contact (two or more per month, for example) and long average enrollment rates, and can demonstrate these in the process data they report. Other process measures that contribute to an overall understanding of intervention intensity include those that reflect actual intervention activities (see below for examples).

One process measure used by several of the patient-based interventions, for example, was the number of patients in the target population who were successfully contacted by case managers or enrolled in case management. Those interventions that relied on care coordination or case management teams also collected data on the average number of patient contacts with case management teams and case manager productivity, both of which can be viewed as measures of intervention intensity. In cases where there was a comparison or control group, grantees also collected process measures for that group to determine whether the intervention increased patient contact with caregivers compared to usual care (such as an existing disease management program that was in place prior to the intervention).

Each of the grantees (except Partnership) reported some type of process measure(s), though some measures were more informative than others.[1] A few reported only a small and simple set of process measures, such as enrollment in case management, so assessing implementation was more difficult for these grantees than for ones who reported multiple measures. The most common process measures were the number of care coordinator or case manager contacts and the proportion of patients placed in case management.[2] Some grantees tailored process measures to fit their interventions more specifically, including measuring the percentage of patients who complied with referrals (Memorial), the percentage of patients with an individualized care plan or a completed clinical intake assessment (CareOregon, Memorial, UCSD), or the number of patients who attended group educational sessions (McKesson). In addition, two grantees reported on the use of mental health and substance abuse treatment by participating patients, key measures for their medical care integration programs (Washington State, Hopkins).

[1] Partnership opted to collect only output and outcome measures, all of which were strongly related to the goals of its intervention.

[2] In addition, two grantees (UCSD and Memorial) reported on the proportion of patients for whom depression screening was completed. Partnership also wanted to report on this measure but was not able to systemically collect this information from clinics participating in its intervention.

b. Outcome Measures

Each grantee's outcome measures aimed to capture evidence of success achieving the intervention's goals over the relevant time period—either in the form of proximate measures that were a direct outgrowth of intervention activities (outputs, such as increased lab testing) or as short- or long-term goals of the intervention (outcomes, such as decreased emergency room use and lower total costs). For this chapter, we considered outputs, short-term outcomes, and long-term outcomes under the single category of outcome measures (though they are differentiated in the logic models presented in each case study).

The most common outcome measures reported by grantees were utilization measures, such as emergency room use or hospital admissions (Table IV.1). Nine of the 10 organizations participating in MVP reported these types of measures. This was not surprising, since all the grantees were interested in examining how their intervention might improve patient quality of care, and reduce hospital use due to poor quality of care. The second most common outcome measure was total overall medical costs or medical costs for particular components of care, such as hospital or emergency room visits (6 of 10 grantees). In addition, two grantees also reported prescription medication costs.

Four grantees collected physical and/or mental health status scores, using several different instruments. Two grantees reported clinical quality of care measures, including both medical and pharmaceutical measures. For example, McKesson reported the proportion of patients with claims for insulin or oral hypoglycemic medications, and Partnership reported the proportion with controlled cholesterol or hemoglobin A1c (among patients with tests for these markers). Because these outcomes were emphasized by their respective interventions, these measures were useful in assessing intervention effectiveness. (Refer to Chapter V for the discussion of process and outcome measures for all MVP grantees.)

B. CHALLENGES

MVP grantees faced a number of challenges during the program. The most common and pronounced challenges were those related to implementation, though some grantees also faced significant challenges in measuring and reporting the possible effects of their interventions.

1. Implementation Issues

Start-up delays were a common implementation issue among MVP grantees. The reasons for the delays varied, but included difficulties in hiring intervention staff (CareOregon, Memorial), obtaining intervention funding (UCSD), securing participation among providers who would be directly involved in the intervention (Partnership), getting buy-in of stakeholder or provider organizations with indirect roles in the intervention (UCSD, Washington State), identifying providers targeted by the intervention (CNS), and finding venues to hold group education sessions (McKesson). For some grantees, there were also strong competing demands—typically stemming from environmental changes affecting the organization's basic business—that may have diverted at least some attention away from the intervention itself (CareOregon, Memorial).

By and large, grantees overcame start-up challenges and were able to implement their interventions. However, some of these barriers are either ongoing or have implications for intervention replicability in other settings. For example, care coordination or case management interventions that employ registered nurses will always have to contend with local or nationwide nursing shortages. Provider-based programs will have to account for the fact that many clients in the Medicaid population they are trying to affect move from one provider to another (making it tougher to reach them).

Low enrollment in the interventions was perhaps the most common implementation issue across grantees. While low enrollment was in some cases related to the slow intervention start-up, other factors also contributed, including limited capacity among intervention staff who treated patients (DC, Memorial, UCSD), lower than expected prevalence of a given condition among the target population (UCSD), patient populations that were difficult to locate or were reluctant to participate (McKesson), and a smaller than expected target population in a particular geographic area (McKesson, Hopkins).

The absence of a standardized, or "protocol-dictated," approach to the intervention reportedly resulted in frustration on the part of intervention staffs (most notably at CareOregon, but also Hopkins). This raises the question for the evaluation of how to evaluate an intervention that changed substantially over time. (As was suggested above, however, all grantees have done some refinement and standardization of their interventions in response to implementation issues along the way, which is entirely appropriate for innovative interventions seeking to work with complex patient populations.)

Limited or lack of provider cooperation was also a challenge for several of the interventions. In some cases, grantees felt they had limited *ability* to affect provider behavior because of the nature of their relationship—contractual or otherwise (Partnership, UCSD). Others found certain types of providers, such as primary care physicians, more cooperative than others, such as mental health providers, perhaps because of a historical division between physical and mental health care (Hopkins in particular experienced challenges with this). One intervention with a provider focus found that while providers were not explicitly uncooperative, they were routinely inundated with so much information that they paid relatively little attention to the intervention itself (CNS). This grantee also found that relying on case manager supervisors to transfer information to case managers was not a successful dissemination strategy, delaying providers' knowledge of the intervention.

Given the various roadblocks faced by grantees, a few grantees who employed existing intervention programs or models, such as IMPACT (Improving Mood-Promoting Access to Collaborative Treatment) and PHASE (Preventing Heart Attacks and Strokes Everyday), had to make modifications to those existing models (UCSD, Partnership). While such modifications of the intervention protocol or approach may have been necessary and appropriate, they limited our ability to compare them to existing versions of these models (and to draw on existing evidence about how these models affect patient outcomes). And while such modifications may have implications for the replicability of these programs, they also reinforce a critical lesson about program implementation—customization and refinement of an intervention to a specific target population often are required.

2. Measurement and Data Issues

Every grantee faced a challenge related to either outcomes measurement and/or data collection. Those with measurement challenges found them to be generally significant, impeding the grantees' ability to report measures during the grant period. The primary causes of measurement problems include (1) limited information technology resources, either in the form of staff time or systems (an issue that was most notable for CareOregon and DC, but was also the case to a more limited extent for McKesson and CNS), (2) lack of expected information in case management databases, registries, or claims data (DCMAA, Hopkins, Partnership),[3] (3) data not being readily accessible (UCSD) or available in electronic form (DCMAA), and (4) data from multiple databases that required synchronization (Washington State). At other sites, problems of poor contact data for Medicaid clients (MHS), data in paper form (DCMAA), or losing access to some data (Memorial) limited or delayed data collection for their projects.

C. FACTORS INFLUENCING IMPLEMENTATION

For most of the grantees, their MVP interventions represented short-term ventures into uncharted areas of patient care. Though some interventions lasted only slightly longer than a year, grantees' experiences still offered insights into factors that influenced the success or failure of implementation efforts. Such factors include leadership commitment and organization, environmental priorities, staff and provider buy-in, state Medicaid agency leadership, and the extent to which standardization was achieved.

1. Leadership Commitment

Nearly all grantees (eight) noted that leadership commitment within their organizations was important to program implementation efforts in one way or another. Some grantees (CareOregon, DC, McKesson, Washington State, Memorial) noted that direct commitment to the program (either new or ongoing) by a senior leader was very important. This was particularly true for resource intensive interventions, those with large start-up costs that might not demonstrate a return on investment for some time, or those interventions facing competing internal demands.

2. Environmental Priorities

Environmental priorities are another factor that influenced grantee implementation efforts. For example, Medicaid reform in Florida was a competing environmental priority for Memorial during the MVP intervention period. The elimination of the Florida: A Healthy State (FAHS) program caused an overall decrease in Memorial's patient enrollment, which drew organizational

[3] This includes issues like participating providers failing to record their communication or contact with other providers, the submitting of claims only for mental health services when perhaps both mental health and substance abuse services were rendered, and lack of any available data prior to the intervention.

attention and resources toward adjusting to these changes. As a result, the health navigator intervention was not considered a top priority by senior management. Conversely, at CareOregon, case management had received a lot of attention in the year prior to the MVP intervention, as evidence (collected as part of CareOregon's Business Case for Quality grant from CHCS) suggested that the plan's case management activities decreased costs per member per month for those in active case management. This evidence spurred CareOregon's chief executive officer to emphasize case management as a primary business strategy—making the MVP intervention one of CareOregon's top priorities.

3. Staff and Provider Buy-In

Nearly all grantees noted that staff buy-in played a role in the success of program implementation. The importance of buy-in was particularly evident for provider-based interventions (CNS, Partnership), and requires active management by the grantee. For example, Partnership actively sought clinic staff to obtain buy-in before implementing its intervention. Additionally, the quality bonus that Partnership offered clinics for participating also likely assisted in securing provider buy-in. On the other hand, CNS did not initially work with individual clinics to obtain provider buy-in, and found that as a result the outreach to providers via the MRM quarterly reports was not as effective as it could have been. Although providers were allowed to bill state Medicaid for review of the MRM reports, it was not widely known among case managers, highlighting the importance of contact with individual providers targeted by the intervention.

Staff or stakeholder buy-in was a crucial factor for many of the patient-based interventions. For instance, the relationship between the IMPACT depression case manager and the Project Dulce nurses was critical to successful implementation of UCSD's intervention. At Memorial, getting the disease managers to work with the health navigator was initially a challenge, but once their respective duties were sorted out, disease managers appreciated the health navigator's work, and the health navigator produced items useful to everyone, such as a list of services available in the community. Since the program was new to the state, stakeholder buy-in from the community was crucial for Washington State's Medicaid Integration Project, and buy-in from long-term care and other providers to participate in the intervention was also key to providing services to its clients. For the DC Medical House Call Program, internal support of hospital staff at the Washington Hospital Center (the program's sponsor) was important because these colleagues understand how the program benefits patients. Notably, two grantees who did not obtain buy-in prior to their interventions reported that in retrospect they should have. Hopkins noted that getting case manager buy-in from the beginning would have helped the intervention in its start-up phase. In addition, CareOregon did not have any buy-in until it standardized its protocols, but staff noted that buy-in from case management staff was ultimately important to its intervention.

4. State Medicaid Agency Leadership and Involvement

Half the grantees reported that state Medicaid's involvement was very important to their ability to implement their interventions because the state was a direct client of the grantees (CNS, McKesson), state officials played a vital role in shaping specific parts of the intervention (CNS), the Medicaid agency was the primary sponsor of the intervention (DCMAA, Washington

State), or because officials contributed to advisory board or task forces which helped shape and direct interventions (Hopkins, McKesson). McKesson also said that state Medicaid officials helped them locate venues to hold the educational sessions and Hopkins noted that the state Medicaid agency provided data to monitor its intervention.

However, for some grantees, state Medicaid's involvement was less crucial to implementation efforts. Two grantees (Memorial and MHS) said that the state's contribution of Medicaid data was helpful to their interventions, but that otherwise Medicaid's direct involvement in decision making would not be crucial to its intervention sustainability. Only three grantees (CareOregon, UCSD, Partnership) said that the state Medicaid involvement was not important at all, or that state Medicaid was not really involved in their intervention.

5. Achieving Standardization Early

Grantees noted that achieving standardization of intervention activities early and employing a "protocol-driven" intervention was important to implementation efforts as it allowed grantees to know what activities were being done and improved their ability to identify problem areas and change them. Standardization also allowed grantees to give clear and structured roles to the staff implementing the intervention. For example, CareOregon discovered the importance of standardization first hand when its case managers were initially confused as to their roles and the role of health guides. Core staff felt that standardizing the intervention allowed the grantee to evaluate what it was doing and to identify and change the parts of the intervention that were not working. Memorial's staff appreciated the standardization of roles for disease managers and health navigator, noting that the protocols made it easier to understand who would conduct what activities. This decreased staff confusion and duplication of efforts.

For some grantees, standardization either did not happen or was challenging to implement. At Hopkins, intervention activities were not standardized as a part of this project and staff recognized that standardization might have limited early communications challenges amongst providers. For Washington State, standardization of protocols for long-term care clients was daunting because each client seemingly had a unique set of issues to overcome. At the end of MVP, care coordinators were still handling each case individually (though in total this group made up less than 10 percent of the program's caseload).

For other grantees, it was clear that the standardization of protocols was important, but this standardization was achieved prior to MVP. For example, DC's Medical House Call Program (DCMAA) has been in place since 1999, so it has become increasingly standardized over time. Two grantees (Partnership, UCSD) adopted existing standardized interventions, though they modified these to fit their target populations for MVP. These grantees noted that working from a standardized program enabled them to get greater participation from provider practices, and that it helped with intervention continuity during staff turnover.

V. ASSESSMENT OF MVP PROCESS AND OUTCOME MEASURES

This chapter addresses the evaluation's third research question: Did the interventions achieve the outcomes sought? In summary, we find solid evidence that one of the interventions generated positive outcomes (Washington State), one did not (CNS), and that the rest were inconclusive because of small numbers, limited time, or weaknesses in the comparison groups. However, descriptive data on four of the intervention processes suggest that they may be worthy of further consideration and testing, particularly if they can be brought to adequate scale (Hopkins, DC House Call, McKesson, Memorial).

In this chapter, we briefly review the inferences we were able to make for each of the grantees based on their designs and implementation experience. We then build on this to provide an overview of the findings across all grantees, focusing on intervention design and implementation, research design, and whether there was evidence of effects on outcomes. Finally, we summarize the outcomes for each grantee (with the exception of Managed Health Services because that grant had a more methodological focus).

A. ABILITY TO DRAW INFERENCES AND OVERALL RESULTS

1. Ability to Draw Inferences on Reported Outcomes

Table V.1 summarizes key characteristics of each intervention that relate to drawing inferences on outcomes. We rated each grantee's intervention design and implementation and its research (evaluation) design (Table V.1).[1] In order for the intervention to have had any effects on outcomes, it first needed to have a strong design and be implemented well. We rated most grantees as *medium* on a low-medium-high scale for intervention design and implementation. The primary factors we considered to create these ratings were whether the intervention had a clear description, was well-defined for its target population, and had been implemented effectively throughout the entire MVP period. Most grantees did not pass the third criteria due to implementation challenges mentioned in previous chapters and documented in the case studies.

[1] Though some grantees made refinements to their interventions over time, the interventions were generally true to their initial designs. Among the subset of grantees (about seven) whose evaluation designs were established before implementation, more than half implemented an intervention consistent with that design. In particular, three grantees who proposed random assignment before implementation were able to randomize patients into treatment and control groups (CNS, Memorial, McKesson). Similarly, one grantee who planned a comparison group based on propensity score matching was able to examine such a comparison group for its evaluation (Washington State). At some sites, the final evaluation design differed slightly from the one proposed early on due to reluctance to randomly assign patients (CareOregon), too small a comparison group size (UCSD), and a smaller than expected target population (Hopkins). Grantees with less-refined evaluation designs at the outset of MVP had some comparison group data by the end of the program, though these groups were not the most appropriate comparison samples (DC, Partnership).

TABLE V.1

SUMMARY OF GRANTEES' INTERVENTION DESIGN AND IMPLEMENTATION, RESEARCH DESIGN, AND EFFECTS ON OUTCOME MEASURES

	Patient-based Interventions							Provider-based Interventions		System Redesign
	CareOregon	DCMAA	Hopkins	McKesson	Memorial	UCSD	Washington State DSHS	CNS	Partnership	MHS
Intervention										
Design	**Low**	**Medium**	**Medium**	**Medium**	**Medium**	**High**	**High**	**Medium**	**High**	**N.A.**
Implementation	**Medium**	**Medium**	**Medium**	**Medium**	**Medium**	**Low**	**High**	**Medium**	**Medium**	**N.A.**
Research Design	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**	**High**	**High**	**Low**	**Low**
Comparison group design	Plan members not enrolled in intervention	EPD clients outside area of program	Clients outside target area	Randomly assigned groups	Randomly assigned groups	None	Propensity-score matched group	Randomly assigned groups	Non-intervention clinic patients	N.A.
Treatment group size	330	500	120	83[a]	120	120	1,400	2,300	225	3,000
Participation rate	100%[b]	20%	70%	33%	70%	100%	100%	100%[c]	100%[c]	100%[c]
Impacts on outcomes										
Process measures	**Unknown**	**Unknown**	**Unknown**	**Unknown**	**Unknown**	**Unknown**	**Unknown**	**No**	**N.A.**	**N.A.**
Service use or cost	**Unknown**	**Unknown**	**Unknown**	**Unknown**	**Unknown**	**Unknown**	**Yes**	**No**	**Unknown**	**N.A.**

[a]Only 28 treatment group members participated in educational sessions.

[b]Number of months per treatment group member varied, average months in intervention was about 30 days for many members during much of the MVP period.

[c]Population-based evaluation where all intervention group members counted in final sample.

N.A. = not applicable.

2. Period for Assessment

MVP grantee reporting periods ranged from 10 months (UCSD) to as many as 27 (DCMAA); the average number of months was about 15 and 8 of the 10 grantees reported data for 12 months or more (Table V.2). However, individual participants may have participated in interventions for shorter periods of time since many of the interventions had rolling enrollment. Half the reporting periods began between October 2005 and April 2006, four began earlier, and only one began later. Due to the number of start-up delays, the extension of the MVP timeline was valuable to the collection of data by grantees, allowing the majority to have more than 12 months of data on which to report. This means that the evaluation for most of them allowed assessing effects that would be apparent after a year of implementation.

3. Overview of Findings

Only two grantees had a sufficiently rigorous design to support any assessment of their impacts (Washington State, CNS).[1] While this was a major limitation to our overall assessment of MVP, reported findings on the intervention process for other grantees provide valuable insight on some innovative and potentially promising programs as well as operational challenges likely to be faced in implementing them.

Washington State's Intervention Appears to Have a Modest Effect on Utilization

The Washington Medical Integration Program focused on better coordination of primary care, mental health, substance abuse, and long-term care for categorically needy aged, blind and disabled beneficiaries. The intervention appears to have had some early success at slowing the rate of inpatient admissions and mental health hospital days among its enrollees. Compared to the baseline period, inpatient admissions rose at a slower rate in the intervention group than in the comparison group. Slow growth in overall hospitalizations was also reflected in the rate of mental health hospital days, which did not rise as much in the intervention group as it did in the comparison group. Though Washington State did not provide any tests of statistical significance, these differences are likely significant given the scale of the intervention. The second finding suggests that the intervention may hold promise in integrating mental health care treatment for clients, a goal of the intervention. Patient survey data also indicate that the intervention improved client satisfaction with some aspects of care delivery (for example, shorter wait times for routine care) and client care coordination.

[1] The strongest analyses of outcomes (an "impact study") include an assessment of intervention-comparison differences with appropriate statistical tests. Only two grantees provided tests for all their outcome measures (CNS, McKesson) and a third (Hopkins) did so for one measure. Most grantees had neither the organizational capacity to conduct these tests nor adequate person-level data. However, for grantees that had large number of intervention group patients and plentiful data, we could make some educated guesses as to the promise of interventions based on the reported measures and what we learned about the interventions during the evaluation.

CNS's Provider-based Intervention Had No Effect on Reported Outcomes

The CNS Medical Risk Management Project attempted to improve the quality of care for a large number of people with a low-cost intervention that distributed information to primary care providers on the services that their schizophrenic patients used in the prior year. Differences in process and outcome measures between the CNS treatment and control groups (for its first treatment group wave) were small and not statistically significant. Compared with usual care, its intervention did not have effects on utilization, health care costs, or patient contacts. The intervention experienced a variety of operational problems which probably contributed to the absence of effects (for example, delays in tracking patients and providers, patients without a medical home, limitations in communication with providers); importantly, the team worked hard to address these limitations as they arose which may ultimately influence the scope of the intervention and lead to more promising outcomes. The qualitative results suggest that at least one reason for the intervention's inability to positively influence outcomes stems from the problems it had both getting information to providers and motivating them to use it. This project

TABLE V.2

GRANTEE REPORTING PERIODS FOR PROCESS AND OUTCOME MEASURES

	Start Date	End Date[a]	Number of Program Months for MVP
CareOregon	October 2005	September 2006	12
Comprehensive NeuroScience[b]	June 2005/ February 2006	October 2006	17/9
DC Department of Health	January 2004	March 2006	27
Johns Hopkins Healthcare	October 2005	January 2007	16
Managed Health Services	April 2005	April 2006	13
McKesson[c]	April 2006/ August 2006	September 2006/ October 2006	5/3
Memorial	February 2006	April 2007	15
Partnership	January 2006	March 2007	15
UCSD	July 2006	April 2007	10
Washington State	January 2005	June 2006	18

Source: MVP grantee reporting workbooks and conversations with grantee teams.

[a]This represents the end date of reporting for MVP only as some interventions are ongoing.

[b]Comprehensive NeuroScience implemented its intervention for two treatment groups, staggered seven months apart from one another. The reporting period end date was the same for each group.

[c]McKesson completed two diabetes education modules (one in Oregon and one in New Hampshire) four months apart.

illustrates 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.

Other Interventions Generated Important Insights on Changing Care Processes

- The Johns Hopkins intervention aimed to use case management within a managed care plan and better communications across sectors of the system to improve care coordination for adult Medicaid beneficiaries with a history of substance abuse and high health care costs, with a focus on improved access to services. Process measures suggested that intervention group clients may have received more substance abuse and mental health care than the comparison group. As Hopkins designed its program to improve care for clients with these problems, this finding is a promising one for the intervention and overall as knowledge of how best to improve access to substance abuse and mental health care is limited.

- DC's medical house call program aims to provide a medical home to people who otherwise cannot physically travel to a physician's office. Intervention group members had higher costs than the comparison group for services that may be identified by program staff: personal care assistants, durable medical equipment, and medications. In addition, the number of nursing home admissions and nursing home days were much lower among the intervention group than the comparison group. However, the comparison group used to estimate program impacts was not a strong one and the program only collected data during the intervention period. These are serious methodological weaknesses that limit what can be learned about outcomes. However, because the population addressed in the DC house call program is a costly one whose needs often go unmet, the DC experience suggests that more rigorous assessment of the intervention and its ability to be replicated elsewhere would be desirable.

- McKesson's project added an intensive in-person group educational component to standard disease management for aged, blind, or disabled Medicaid clients with diabetes. Laboratory testing results and self-efficacy scores for sample members in McKesson's Oregon site provided a glimpse at the promise of this educational intervention, though neither treatment-control difference was statistically significant. Improvements in these short-term outcome data are prerequisites for reducing future adverse events. However, the desirability of future tests of this intervention probably requires first addressing better implementation and assessing whether this intervention can be implemented in a way that is sufficiently scalable to warrant the effort.

- Memorial's health navigator intervention added a social worker to its existing disease management program to help patients understand the health and non-health services available to them. The health navigator completed intake assessments with all patients she visited and completed a care plan with a high proportion of them. Treatment group members had nearly twice as many contacts with either the health navigator or their primary disease manager compared with control group members.

All of these process measures are considered, by Memorial, prerequisites for improving longer-term patient outcomes, but its loss of a considerable portion of its intervention population due to Medicaid reform makes it challenging to determine if there were impacts.

- CareOregon provided team-based case management to patients with various chronic medical conditions with the intent of varying the intensity of the intervention based on client needs to maximize impact on utilization and costs. For example, some clients could be referred to mental health services and others linked to community resources. Setting standards for such a flexible intervention is difficult. While the intervention was not standardized at the outset of MVP, the project team made great strides over the course of the intervention to define roles for intervention staff and standardize protocols of care. CareOregon found that clearly defined staff roles and protocols for staff improved delivery of the intervention. Because the intervention changed over time and was not paired to a similar comparison population, it is not possible to gauge the potential of the intervention to generate the savings it hoped.

- Partnership's provider-based intervention aimed to improve patient quality of care for patients with diabetes and other comorbidities. Partnership made a conscious decision to work with specific practices with which it has long-standing arrangements and to give these practices flexibility to make changes as they saw fit. Partnership found that involving a team from each office promoted ownership and helped office staff better understand the intervention; however, the design did not generate sufficiently detailed information on the intervention or credible estimates of its effects. Partnership also had a parallel program for diabetes that was patient-focused. Their experience helped generate insight on the importance of coordinating intervention practices with the activities of existing interventions to avoid duplication.

- UCSD added a depression treatment program to a diabetes disease management program at three community clinics; both programs have been studied independently, but never together. Regrettably, the project experienced delays in start up related to the need to line up funding and then subsequent problems in implementation related to obtaining funding for care for uninsured patients and operational challenges (including coordination between clinic staff and the depression care manager). They also found lower than expected prevalence of depression in the target population. Despite these factors, once the depression care manager began working with patients the intervention was intensive, suggesting that the intervention could hold promise if it could eventually be scaled and implemented long enough.

- The Managed Health Services project addressed a policy question important to many Medicaid policymakers: Can we identify clients in need of case management services more efficiently than through resource-intensive health risk assessments? After reviewing two different risk assessment tools (one based on patient self-reports and the other on claims data), MHS believes that the claims-based tool coupled with other data offers an opportunity to identify clients in need of case management more efficiently than is possible with self-reported data. However the design of the study limits the confidence in such conclusions. Because the issues addressed are

important, it could be valuable to study the question further with a more focused design accounting for how case management decisions are made.

B. SUMMARY OF OUTCOMES FOR INDIVIDUAL GRANTEES

In this section, we provide a short summary of reported outcomes for each grantee's intervention (in alphabetical order). We report on process measures for all grantees and outcome measures for all except two with very small numbers of people in their intervention groups. Because Managed Health Services' project was different from the other interventions and did not report data in the same way as other grantees, we leave the description of that project and its results to its case study. Readers who want additional details on specific projects can find these in the case studies in the second part of this report.

CareOregon

***Intervention*:**	Case management for patients with various chronic conditions provided by registered nurses and care coordination assistants in a team-based setting
***Design*:**	Comparison group of all other plan members not in enrolled case management

Data Suggests…

- Intervention intensity was moderate to high
- Not enough information to determine potential effects on outcomes

To compare intervention group outcomes to existing care, CareOregon constructed a comparison group from plan members who did not participate in the intervention, measuring outcomes at baseline and over the first intervention year. For most measures, the two groups were very different at baseline, even when controlling for ACG score (see the case study for further details), making it difficult to ascertain whether differences were due to the program or other unobservable factors.

CareOregon process measures indicate that intervention intensity was moderate to high. Staff reported that early enrollees had only about one month of enrollment on average, but that later enrollees had longer enrollment periods. The average number of case managers contacting patients per month was about 15. Case managers had contacts with 26 members per week (or a little more than 5 per day) on average. Assuming an average caseload of 300 patients (roughly the monthly average near the end of the intervention period) in any given month among 15 case managers, this contact rate equates to an average of 5 contacts per member per month (more than one per week). The average number of clinical assessment questionnaires completed per month by case managers was about 70.

There is little evidence to suggest that CareOregon's intervention influenced patient outcomes. Among patients with ACG scores of 0.5 or more, the number of emergency room visits fell about 10 percent in the intervention group but only 6.6 percent for the comparison group compared with baseline.[2] However, given the weak comparison group design, it is not possible to determine if the differences in these trends are intervention impacts. Differences in trends (from baseline to followup) for the intervention and comparison group for health care costs and hospital admissions were also small (see the case study for further details).

[2] CareOregon was unable to obtain individual level data for each patient in the sample, so statistical tests of significance were not conducted for these intervention-comparison differences. Because CareOregon was most focused on its highest-cost patients, we report only results for patients with large ACG scores (greater than 0.5) in this chapter. Information on patients with lower ACG scores is included in the case study.

Comprehensive NeuroScience

***Intervention*:**	Health care services utilization summaries (constructed from claims data) provided to patient's physicians and case manager for identified patients with schizophrenia
***Design*:**	Randomly assigned treatment and control groups (3,000 total patients)
Data Suggests…	
	• Intervention had no effects on reported process or outcome measures

CNS randomly assigned identified patients to a treatment group (2,281 members released in two waves) and a control group (729), the largest randomized design among all MVP grantees. CNS sent mailings to providers for its first treatment group wave (1,150 patients) over 17 months (see the case study for further details).

Over those first 17 months of the intervention, treatment-control differences in process and outcome measures (for the first treatment group wave) were small and not statistically significant (Table V.3).[3] Compared with usual care, the intervention did not have effects on utilization (inpatient admissions or emergency room visits), health care costs (inpatient, outpatient, or medications), or patient contacts (case management units). Given the challenges CNS encountered in identifying providers, sending mailings, and informing providers of the intervention (as described in the case study), it is not surprising that there were no treatment-control differences. Importantly, the team worked hard to address these limitations as they arose, which may ultimately influence the scope of the intervention and lead to more promising outcomes. These findings highlight the need in a provider-based intervention to inform and educate the target audience as quickly as possible of the intervention's goals and activities.

This project illustrates 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. 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**.**

[3] 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 emergency room visits. See the case study for additional details.

TABLE V.3

CNS-REPORTED AVERAGE MONTHLY OUTCOME MEASURES FOR THE TREATMENT AND CONTROL GROUPS, JUNE 2005 TO OCTOBER 2006

	Treatment	Control	Difference	p-value
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**		

Source: Missouri Medicaid claims data and CNS reporting workbook

Notes: All outcomes are measured in per-member-per-month units and only include those months for which patients were enrolled in the intervention. These data reflect the experience of the first treatment group (mailings began in May 2005). Information on the second treatment group is included in the case study.

The total number of treatment group members in this table differs from the total who were randomly assigned because 50 members were deemed ineligible by the time of the first mailing.

DC Medical Assistance Administration

***Intervention*:**	Medical house call program (MHCP); team of physicians, nurses, and social workers visit homebound patients enrolled in the Elderly Persons with Disabilities (EPD) waiver
***Design*:**	Compared outcomes of elderly patients in house call catchment area to those outside that area; a number of data limitations limit ability to evaluate the house call program

Data Suggests…

- Intervention group had more contacts, but average number low in general
- Utilization and cost results mixed; intervention patients using needed services, but overall costs much higher than comparison group

To examine potential intervention effects, the outcomes of elderly patients who reside within the MHCP catchment area (496) were compared to clients who reside outside of the area (654).[4] The data provided were insufficient to make inferences about the effectiveness of MHCP and had three primary drawbacks: (1) no pre-enrollment data were available, (2) intervention and comparison group clients had different average number of months enrolled in the EPD waiver, and (3) participation in MHCP was low (less than 20 percent).

The average number of case manager and provider contacts with elderly EPD patients in the intervention group (0.89) was more than twice that observed for patients in the comparison group (0.40) over the 27-month study period. But the average number of contacts was low in both groups—less than one per month. Due to data limitations (noted in the case study and above), we cannot conclude that differences across the two groups were due solely to MHCP.

Reported outcome measures for 2004 through the first quarter of 2006 provide a mixed picture for MHCP (Table V.4). On the one hand, clients in the catchment area had higher costs for services than are normally identified by program staff: personal care assistants, durable medical equipment, and medications. In addition, the number of nursing home admissions among the intervention group was about 60 percent lower and the number of nursing home days was 75 percent lower than the comparison group. While these differences suggest that the program may have played a role in limiting nursing home days for clients in the intervention group, the intervention suffered from serious methodological weaknesses that limit what can be learned (see the case study for further details). On the other hand, patients residing within the program catchment area had about 50 percent more inpatient admissions and about one-third more emergency department visits than patients in the comparison group. Moreover, total medical costs per month were more than 80 percent larger for patients within the MHCP catchment area compared with those outside the area. These large differences could be due to house call program staff identifying needs of patients that are unidentified by other home- and community-based programs, but methodological weaknesses make it difficult to come to a definitive conclusion.

[4] Only 85 clients were enrolled in the house call program over the study period.

TABLE V.4

REPORTED OUTCOME MEASURES AMONG EPD WAIVER PATIENTS
RESIDING WITHIN AND OUTSIDE THE MHCP CATCHMENT AREA

	Patients Residing in the MHCP Catchment Area	Patients Residing Outside the MHCP Catchment Area	Difference
Health Care Utilization (per 1,000 Patient Months)			
Inpatient admissions	44.0	29.6	14.4
Emergency department visits	181.6	134.9	46.7
Nursing home admissions	1.7	4.4	–2.7
Nursing home days	57.5	215.7	–158.2
Health Care Costs (per Member per Month)			
Total medical costs	$3,245	$1,748	$1,497
Personal care assistant costs	$1,044	$361	$683
Pharmacy costs	$252	$139	$113
Inpatient costs	$186	$204	–$18
Durable medical equipment and supplies costs	$95	$46	$49
Nursing home costs	$66	$67	–$1
Number of Beneficiaries	**496**	**654**	
Number of Months Enrolled	**5,775**	**16,934**	

Source: Reported by DCMAA on July 19, 2006 from Medicaid claims data.

Note: The figures represent patients who were enrolled in the EPD waiver, for at least three months, during calendar years 2004 and 2005 as well as the first quarter of 2006. Outcome measures represent data collected over the same period.

EPD = Elderly Persons with Disabilities; MHCP = Medical House Call Program.

Johns Hopkins Healthcare

***Intervention*:**	Case management provided by registered nurses and substance abuse case managers to health plan clients with a history of substance abuse
***Design*:**	Compared intervention group patient outcomes to health plan clients in other Maryland counties (some with lower ACG scores)

Data Suggests…

- Mixed success at improving communications with patients and providers, some evidence that the intervention group received more targeted substance abuse and mental health care than the comparison group
- Reduction in hospital readmissions, but not other outcome measures

For its comparison group, Hopkins chose clients from seven other Maryland counties, but used a different ACG threshold to obtain a group of adequate size (see the case study for more details). Intervention-comparison group differences were large at baseline—more than 40 percent for each measure. Because of these differences, we examined differences in the trends in reported outcomes rather than a head-to-head comparison between the two groups. However, even this approach is suspect, given the large baseline differences and small numbers of people in each group (about 100 in each).

Hopkins had mixed success at communicating with intervention group members and their providers. Case managers contacted about 75 percent of eligible patients over the intervention period and more than 90 percent of enrollees' primary care providers. However, staff had less success in contacting substance abuse or mental health providers, reaching them for only 41 percent and 21 percent of clients, respectively.

Other process measures suggest that intervention group clients may have received more targeted care than the comparison group for their substance abuse and mental health problems. The proportion of intervention group patients with substance abuse treatment nearly doubled (17 to 31 percent) while the percentage in the comparison group dropped slightly (27 to 25 percent). Similarly, the proportion of patients with mental health treatment was 15 percent larger in the intervention group than the comparison group at followup. It is possible that patients were steered to this care by the case management staff, as the intervention had hoped. However, we also cannot rule out other unobserved factors or determine if these differences are significant.

Outcome measures reported by Hopkins suggest that the intervention had mixed success. Average monthly medical costs fell by 7 percent in the intervention group compared with a 17 percent drop in the comparison group (Table V.5). However, given that Hopkins sought to increase the use of specialty treatment services, it is not surprising to see a slower reduction of total costs in the intervention group within only 16 months. Trends in readmissions (within 31 days of a discharge) were more promising for the intervention. The number of readmissions fell more than twice as much for the intervention group (49 percent) as they did in the comparison group (21 percent). Even with a small sample and controlling for ACG scores, this result is likely statistically significant and suggests that while overall admissions were unaffected (see Table V.5), the intervention may have reduced readmissions (though without a stronger research design, we cannot rule out other factors as well).

TABLE V.5

OUTCOME MEASURES REPORTED BY HOPKINS FOR THE INTERVENTION AND COMPARISON GROUPS AT BASELINE AND FOLLOWUP

	Intervention Group				Comparison Group			
	Sample Size	Baseline	Followup	Percent Difference	Sample Size	Baseline	Followup	Percent Difference
Average monthly medical costs per member	119	$2,826	$2,629	–7.0	127	$1,611	$1,332	–17.3
Inpatient admissions (per 1,000 member months)	119	1,715	1,189	–30.7	127	947	685	–27.7
Readmissions (per 1,000 member months)	119	418	215	–48.6	127	225	177	–21.3

Source: Hopkins MVP Workbook reported on June 11, 2007.

Note: The baseline period was November 2004 to October 2005 and the follow-up period was November 2005 to January 2007. Statistical tests controlling for ACG score at baseline confirmed that the trend in average monthly medical costs for the intervention group was significantly different than the trend for the comparison group (p = .049). Hopkins chose to conduct a statistical test for only this variable. See the case study for further details.

McKesson

***Intervention*:**	Group diabetes education program added to existing disease management
***Design*:**	Randomly assigned treatment and control groups in Oregon and New Hampshire, but only 28 patients attended all sessions

Data Suggests…

- Slightly larger self-efficacy scores in treatment group compared with control group, but difference not statistically significant
- Not enough information to determine if intervention had effects on patient outcomes, but some promising results nonetheless

McKesson reported six months of outcomes data for its Oregon cohort and three months for its New Hampshire group, but had a total of only 28 patients attend sessions in both states. These factors make it difficult to infer that the intervention had an effect on outcomes. However, self-reported patient self-efficacy measures and some reported short-term outcome measures provide a snapshot of the intervention's potential promise, though no treatment-control differences were statistically significant.

Reported data suggests that self-efficacy was slightly higher among treatment group patients, but not enough to suggest their scores were any different from control group scores. Among treatment and control clients (pooled across both states) who completed baseline and follow-up self-efficacy surveys, average self-efficacy scores at followup were slightly larger for the treatment group (6.4) than the control group (5.6), but the difference (about 14 percent) was not significant. However, the difference is promising for McKesson, and all patients who attended sessions reported getting a lot out of them (see case study for more details). This is reinforced by the fact that all patients who attended one session also attended the remaining three sessions of the four-session modules.

Two short-term outcome measures—the proportion of patients with HbA1c tests and prescription drug claims—of sample members in Oregon provide a glimpse at potential intervention promise. In the first five months after attending educational sessions, about 70 percent of the treatment group had an HbA1c test conducted, compared with about 55 percent of the control group. Although this difference was not statistically significant, it is noteworthy because in the year before the educational sessions there was essentially no difference in this measure between the treatment and control groups. A larger proportion of the treatment group also had fills for either insulin or oral hypoglycemic medications, compared with the control group (77 percent versus 65 percent), though this difference was also not significant and was essentially the same as the difference at baseline. Thus, there was no effect on medication use. Although we cannot definitively conclude that the intervention had an effect on HbA1c testing, these short-term outcome data are suggestive of a potential beneficial effect of the intervention on outcomes that are normally related to fewer future adverse events. These outcomes also suggest that differences in patient self-efficacy results are also promising as these measures are associated with what patients learned in educational sessions.

Memorial

***Intervention*:**	Social worker with mental health background (health navigator) added to existing disease management program to help patients understand the services available to them
***Design*:**	Randomly assigned treatment and control groups, but lost a large portion of its intervention population due to Medicaid reform in Florida

Data Suggests…

- Highly intensive intervention, treatment group patients had nearly twice as many contacts as control group patients
- Not enough information to determine effects on outcome measures

Memorial's health navigator conducted home visits for more than three-quarters of treatment group patients. Among those receiving a visit, the navigator always completed a psychosocial intake, suggesting a strong rapport between navigator and patient and a willingness on the part of the patient to provide information. By the end of MVP, nearly 80 percent of those with a home visit received an individualized care plan, which included items like referrals to social service agencies, completion of an application for adult day care, and referrals to a mental health provider. Nearly all clients with care plans complied with referrals. While these data reflect only a small number of patients, they indicate the high intensity with which the intervention was implemented.

Patient contacts data also provide an indication for the intervention's intensity. In only a short period of time, the health navigator intervention was successful at increasing the number of patient contacts with Memorial staff. On average, treatment group members had nearly twice as many contacts per quarter with either the health navigator or their primary disease manager, compared with the control group (4.5 contacts per treatment group member versus 2.4 per control group member). While we do not have statistical tests to test whether these differences are significant, the results themselves demonstrate the importance of the navigator to patient interaction with staff.

Memorial provided some information on targeted outcomes (patient satisfaction, self-reported mental health scores, and inpatient admissions), but the number of respondents for the self-reported measures were very small. With the information provided, we cannot determine whether or not the intervention had an effect on these outcomes. (See the case study for further details.)

Partnership

***Intervention*:**	Provider-based intervention aimed at increasing patient medication use and laboratory testing, promoting lifestyle changes, and improving control of clinical markers
***Design*:**	Comparison group of clients treated at non-intervention clinics
Data Suggests…	
	• Intervention had no effects on reported process or outcome measures

Partnership intervened with physicians at eight practices who agreed to participate in this quality improvement program (for which clinics received monetary bonuses). The target population of patients (about 225) were clients with diabetes and comorbidities of hypertension, cardiovascular disease, and depression. Partnership chose a comparison group of patients from all other clinics with which it contracts (excluding Kaiser clinics that were implementing a similar intervention), consisting of about 1,650 patients from almost 90 practices (the number of physicians ranged from one—like most of the intervention sites—to five or more). For many of the outcome measures, baseline intervention-comparison group differences were large, implying that the comparison group was not a good match for the intervention group and making inferences on potential effects difficult. The variation in practice size between the intervention and comparison groups is another factor that made inference on reported outcomes difficult (see the case study for further details).

Reported outcome measures provide little evidence that the intervention affected patient outcomes, compared with usual care provided to the comparison group. For example, the increase from baseline to followup in the proportion of patients with HgA1c tests was not different in the intervention group from change in the comparison group. Likewise, changes in the proportion of diabetic patients with an LDL test were also small for both groups. Not surprisingly, there were also no meaningful differences in the proportion of patients with controlled HgA1c or LDL between the intervention and comparison groups. These differences are likely not statistically significant, but Partnership did not have the data to conduct the appropriate statistical tests.

Reported prescription drug utilization measures also suggested that the intervention did not have much of an effect on patients in intervention clinics, compared with those in the comparison group. Changes from baseline in the proportion of patients with ACE inhibitor, statin, or beta blocker prescriptions were either smaller or not considerably different (and likely not statistically significant) from changes in the proportion of comparison group patients with these prescriptions. The lack of promising outcomes may reflect (as noted in the case study) that not all intervention group patients visited participating clinics during the intervention period (intent-to-treat framework), the fact that some participating practices engaged in less intensive intervention activities than others, or that Partnership compared smaller practice sites to a mix of small and large ones. An additional confounding factor was a patient-based intervention targeting clients with diabetes that occurred at the same time as Partnership's MVP intervention.

UCSD

***Intervention*:**	Added a depression treatment program to existing diabetes management program
***Design*:**	No comparison group (dropped at end of MVP)
Data Suggests…	
	• Intervention implementation was intensive in its first 10 months
	• Not enough information to determine if program had any effects on outcomes

Due to a late start and lower than expected prevalence of depression among target patients, only 113 patients (at three clinics) were enrolled in the intervention as of April 2007 and, because of small enrollment (less than 20), a comparison group (at a fourth clinic) was dropped at the end of MVP. This weak research design and the lack of claims-based outcomes data (see the case study) made it challenging to assess this intervention's effects on targeted outcomes.

Information on process measures (for the period July 2006 to April 2007) provided by UCSD suggest that intervention implementation was intensive. Although only one depression care manager was hired to work at three clinics with more than 100 patients (a large caseload for a small-scale intervention), all intervention group patients had a depression care plan as of April 2007. In addition, the depression care manager made an average of more than 4 visits per patient, 90 percent of which were in-person, suggesting that the care manager engagement with clients was lengthy. Although it is not possible to determine if these contacts had an effect on targeted outcomes, they do suggest that the intervention was implemented as originally intended.

The depression care manager used one of three therapy approaches (independently or in combination) with patients: problem-solving (patient and care manager made a list of problems and solutions), behavioral activation (care manager got patients to engage in activities they formerly enjoyed), and antidepressant medication. The most common therapy was behavioral activation (64 percent), followed by problem-solving therapy (57 percent), and antidepressant medication (31 percent). Almost two-thirds of patients received more than one type of therapy at the same time.

Washington State DSHS

***Intervention*:**	Integration of primary care, mental health, substance abuse, and long-term care services, customarily provided separately, for categorically needy aged, blind, and disabled clients (under one contract with Molina Healthcare of Washington)
***Design*:**	Comparison group of clients from other counties using propensity-score matching

Data Suggests…

- Not enough data to determine effects on process measures (only one indirect measure)
- Slowed rate of inpatient admissions and mental health hospital days

Washington State reported outcomes for 1,427 intervention patients who were enrolled in the Washington Medical Integration Program (WMIP) in December 2005 and 15,301 patients identified as a comparison group. Data reported by Washington State suggest that these two groups were well-matched, creating a strong research design from which to draw conclusions on outcomes. (See the case study for further details.)

Washington State's intervention targeted aged, blind, and disabled clients, many of whom have a history of substance abuse. To examine if services were provided, Washington State reported the proportion with alcohol or other drug (AOD) treatment needs who received such treatment from January 2005 to June 2006 and a 12-month baseline period. Among the intervention and comparison groups, about 20 percent had AOD needs. The proportion who received AOD services in the followup period rose at a slower rate in the intervention group compared with the comparison group (22 percent versus 31 percent). Care coordination staff reported that enrollees often did not report substance abuse problems, making it difficult to provide services to patients who did not report a need. However, because Washington State was one of the grantees to not collect contact data, it is not possible to determine whether patients did not report substance abuse problems or if the intervention was not intensive enough to elicit these problems.

WMIP may have had some early success at slowing the rate of inpatient admissions and mental health hospital days (Table V.6).[1] Compared to the baseline period, inpatient admissions rose less than 10 percent in the intervention group, but grew nearly 25 percent in the comparison group. Slow growth in overall hospitalizations was also reflected in the rate of mental health hospital days, which rose 46 percent in the intervention group (from October 2005 to September 2006) but more than doubled in the comparison group over the same period of time. These differences are likely statistically significant and the last finding suggests that the intervention may hold promise in integrating mental health care treatment for clients.

Patient surveys conducted by DSHS indicated that WMIP improved (1) satisfaction with some aspects of care (and reduced it for others) and (2) care coordination for many clients.

[1] Because the long-term care component was implemented in late 2006, Washington State did not report any measures related to this aspect of the intervention.

WMIP enrollees reported improved satisfaction with wait times, delays for approvals, customer service, and paperwork. But, enrollees were less satisfied with getting help during regular office hours, for urgent care, for some treatment or counseling, and with prescription drug coverage.

TABLE V.6

WASHINGTON STATE OUTCOME MEASURES BEFORE AND AFTER WMIP IMPLEMENTATION
(Per 1,000 Member Months, Unless Otherwise Noted)

	WMIP Enrollees				Comparison Group			
	Sample Size	Pre-Intervention	Intervention	Percent Difference	Sample Size	Pre-Intervention	Intervention	Percent Difference
Inpatient hospital admissions	1,427	13.8	15.0	8.7%	15,301	13.8	17.2	24.6%
Outpatient emergency room visits	1,427	127.8	127.0	–0.6%	15,301	113.8	114.7	0.8%
Physician visits	1,427	1,084	1,069	–1.4%	15,301	1,047	1,108	5.8%
Prescriptions filled	1,427	3,420	3,643	6.5%	15,301	3,346	3,731	11.5%
Mental health prescriptions filled	1,427	637	680	6.8%	15,301	604	635	5.1%
Mental health hospital days	1,427	13.8	20.2	46.4%	15,301	20.4	41.9	105.4%

Source: Washington State MVP Data Briefing, April 15, 2007 and MVP workbook.

Note: The pre-intervention period was calendar year 2004 for all measures except for mental health hospital days for which October 2004 through September 2005 was the pre-intervention period. The intervention period for all members but mental health hospital days was January 2005 through June 2006; for mental health hospital days it was October 2005 to September 2006. Comparison group members were enrolled in fee-for-service Medicaid in King, Pierce, Whatcom, Skagit, Kitsap, Thurston, and Clark counties. WMIP enrollees include all Medicaid-only members enrolled in the intervention in December 2005.

VI. SUSTAINABILITY AND REPLICABILITY

The ultimate goal for the sponsors of MVP, as well as the grantees themselves, was to identify successful interventions for Medicaid beneficiaries with multiple chronic conditions and to sustain and replicate the success stories. This relates to the evaluation's final research question: How generalizable is the experience of MVP grantees? For most, the MVP interventions represented new ventures into uncharted areas of patient care. Although some interventions lasted only slightly longer than a year during the MVP grant period, grantees' experiences still offer insights into factors that influence the sustainability of interventions beyond that experience. In addition, the interventions provide insight into their replicability to Medicaid policymakers who may be considering interventions targeted at improving the quality of care for chronically ill Medicaid beneficiaries.

A. SUSTAINABILITY

Whether the interventions pursued by grantees as part of MVP are sustainable over time—either in the short run or over the longer term—is an important consideration when assessing the success of the MVP initiative overall. While prospects for sustainability may represent calculated guesses in some cases, grantees' responses during interviews nonetheless provided some sense of the likelihood of sustaining them and the factors that might help.

Table VI.1 presents information on the status of each MVP intervention as of April 2007. More than half the grantees (seven in total) were continuing their interventions after MVP, and all of these appear to have fairly good prospects for longer-term sustainability. Among the other grantees, one has been funded to continue without a formal evaluation (CNS), and another has institutionalized several of the *activities* related to the intervention, even though the intervention per se was not sustained (Hopkins). For example, Johns Hopkins trained nurses on mental health issues as part of its intervention, and staff reported that many of the ideas underlying the intervention—such as trying to better integrate mental and physical health care—will still be used after the MVP grant period.

Several factors appear to influence whether the MVP interventions would be sustained beyond the end of the MVP grant period. The most commonly cited factors were leadership commitment, the availability of funding for intervention activities and staff, and the demonstration (or at least the expectation) of a positive return on investment for the intervention.

Leadership Commitment. Leadership commitment within the grantee organization and any partnering organization(s) appears key to whether interventions will be sustained over time. Some grantees (CareOregon, DCMAA, McKesson, Washington State, Memorial) noted that direct commitment to the program (either new or ongoing) by a senior leader was very important during the MVP grant and will remain so in the future. This was particularly true for resource-intensive interventions, those with large start-up costs that might not demonstrate a return on investment for some time, or those interventions facing competing internal demands. Other grantees noted that commitment of an outside partner improves the chances of sustainability.

TABLE VI.1

STATUS OF MVP INTERVENTIONS AT THE END OF MVP GRANT PERIOD

Grantee	Status as of April 2007	Notes on Status
CareOregon	Still in place	Intervention has strong support among senior management (which has placed substantial emphasis on case management); funding available in large part because of leadership commitment; positive ROI is important but not necessary in short term.
Comprehensive NeuroScience	Intervention will continue under a different contract, but without evaluation.	Plans to enhance the intervention for further implementation in Missouri and other states. Did not measure ROI, but plans to in the future to increase marketability.
Hopkins	Ended in January 2007	Never intended to keep intervention in place after MVP; however, staff training and some care integration practices appear to have been institutionalized. Did not formally measure ROI.
Managed Health Services	No plans to continue analysis.	Grantee might apply their model to other patient groups; did not measure ROI; and believes there are implications for case management placement decisions.
McKesson	Interventions in New Hampshire and Oregon have ended, but will implement sessions in other locations.	Grantee plans to implement more pilots in other locations over the 18-24 months following MVP. Already implemented one pilot outside of the MVP grant in Mississippi in fall 2006 with Medicare beneficiaries.
Memorial	Still in place	Intervention has strong support among senior management as well as disease management staff; sustainability over the longer term rests on availability of funding for health navigator and whether competing priorities and financial stresses emerge; positive ROI is important but better support for disease management staff is also perceived as important.
Partnership	Still in place	Leadership at one intervention clinic is interested in continuing the intervention and disseminating its concepts to its other providers. ROI not measured yet, as the intervention is viewed as a longer-term investment.
UCSD	Still in place	Intervention has strong support among Whittier Institute staff; funding for intervention activities is a major issue, especially for uninsured patients; positive ROI is not important for clinics since most intervention patients are not capitated.
Washington DC Medical Assistance Administration	Still in place	Program will continue as a home- and community-based services option for DC Medicaid clients who qualify; program sponsor committed to sustaining it.
Washington State DSHS	Still in place	Legislature included expansion of WMIP in budget, but whether the program expands depends on outcomes. Formal measurement of ROI planned but not completed.

DC = District of Columbia; DHHS = Department of Health and Human Services; DSHS = Department of Social and Health Services; ROI = Return on Investment; UCSD = University of California, San Diego; WMIP = Washington Medical Integration Partnership.

For example, UCSD's partnership with the Whittier Institute appears to be key in sustaining its intervention, given that the Whittier staff is highly committed to the work and has influential ties with other organizations in the community.

Funding. Availability of funding for intervention staff and activities is another important factor related to sustainability. The interventions, particularly those that hired dedicated staff to carry out intervention activities (for example, CareOregon, Memorial, UCSD), must have funding available for the intervention to be sustained over time. Clear leadership commitment is related to funding, as leadership can prioritize funding for such projects. For example, UCSD will need to find funding for its intervention's depression care manager in the future. Its partner, the Whittier Institute, is committed to having the depression care manager continue at participating clinics, and therefore is actively working to acquire other grant funding. During the MVP grant period, CareOregon's CEO decided to focus on case management as a business strategy, dedicating more of the organization's funding to interventions such as the MVP.

Return on Investment. Another factor that can influence program sustainability is the ability to demonstrate a return on investment (ROI), or make a solid "business case" for an intervention. Most of the grantee organizations felt that, in general, demonstrating the business case for intervention activities was important. However, few MVP grantees actually planned to measure ROI following the intervention period—either because they saw the intervention as an investment that would reduce costs over the longer term or because a less rigorous analysis of outcomes was sufficient to convince management of the value of the intervention activities, sustaining the intervention for the shorter term. In addition, most of these interventions do not appear to be very resource intensive. Organizations may feel that spending such modest sums does not justify the need for rigorous evidence of effectiveness, particularly if it promotes innovation and demonstrates the sponsor's efforts to help patients and improve care or if it generates goodwill among invested staff.

Two grantees planned to measure ROI following the conclusion of the MVP grant. One grantee (CNS) reported that saving its clients' money is at the core of its business, so proving a business case for its interventions was key. Another grantee's intervention (DCMAA) was designed, in part, to offer Medicaid clients an alternative to expensive nursing home care, so providing evidence that the intervention does this "plays a big role" and will be critical to sustainability.

Other grantees hoped that the MVP grant would provide a return on investment at some time in the future, but did not have any plans to measure ROI immediately following the MVP intervention. Three grantees (McKesson, Memorial, and Partnership) felt that the long-term outcomes of the intervention were more important to their organizations, so demonstrating return on investment over a shorter period was unnecessary. Partnership, for example, felt that better management of diabetes patients would take years to show significant cost savings, when lengthy hospitalizations, amputations, and other costly procedures would be avoided. Two health plan grantees (Hopkins and CareOregon) noted that reducing the cost of care for their highest-cost clients (through better coordination or provider incentives) is important to the financial stability of its organizations in the face of the tight state budgets and low capitation rates, but did not feel it was necessary to measure ROI immediately following the intervention period. CareOregon felt that rigorous assessment of outcomes was less important than continuous improvement of

intervention processes and reported that less rigorous analysis of outcomes (for example, simple pre-post analysis) was enough to convince management that continuation of the intervention in the shorter term was warranted.

For other grantees, such as UCSD, ROI in the traditional sense was not important at all in determining whether to continue the intervention. Since UCSD is a research institution rather than a health plan, demonstrating the business case was not relevant to sustaining the intervention.

B. REPLICABILITY

The potential for replicability of MVP's most successful interventions by other organizations is also important in assessing the success of MVP overall. The replicability of an intervention depends on: (1) the clarity and specificity of intervention activities (do we know what the intervention is in enough detail that another organization could repeat it); and (2) its organizational and environmental context (how unique is the setting in which the program took place and how applicable is it to other settings). Whether or not it makes sense to replicate an intervention also depends on what is known about its value (are there potential benefits to organizations implementing it and to their patients or providers in terms of favorable impacts on quality, patient outcomes or cost in the short- or long-term).

In Table VI.2, we summarize MVP grantees' intervention standardization at the end of MVP and the uniqueness of organizational or environmental factors that influenced each intervention. For each grantee, we specify factors that are key for other organizations to consider when replicating these interventions.

Most grantees thought that their interventions were replicable. Indeed, several grantees (for example, Hopkins, CareOregon, Partnership) reported that external organizations had contacted them about their interventions, and showed interest in replicating at least components of the interventions. By and large, the interventions appear relatively "generic" efforts that could work in many, though not necessarily all, environments, with some modest tailoring to fit particular organizational features. Most interventions appear to have sufficient documentation to support efforts at replication. However, in a few cases, replication would be difficult because the interventions were not well documented and standardized protocols were not developed.

Clarity and Specificity of the Intervention. Most fundamentally, an intervention has to be clearly defined and its activities well-specified in order for it to be replicable by others. MVP grantees varied on the extent to which they standardized their intervention activities or protocols. Some grantees made considerable progress during MVP in clarifying and specifying their interventions. For instance, Memorial's staff appreciated that its health navigator would have a distinct role relative to existing disease management nurses and would follow specific protocols in order to bring added value; they found that protocols made it easier to understand whether the navigator or the nurse would conduct a given activity. CareOregon discovered the importance of standardization when its care managers were initially confused as to their roles and the role of health guides.

Documentation of the intervention activities is also important, as it improves the potential for replicability. For example, McKesson created a standard workbook it can use to replicate its intervention in the future and has begun training staff internally on group facilitation techniques to prepare it for future educational sessions. Similarly, CareOregon developed a substantial amount of written materials for its staff when standardizing its approach to the intervention.

For other grantees, the standardization of protocols was also important, but not necessarily something that was learned over the course of MVP. For example, the Medical House Call Program (DCMAA) has been in place since 1999 and became increasingly standardized over time. Two grantees (Partnership, UCSD) were already using standardized interventions, though they modified these slightly to fit their target populations for MVP. Care coordination teams at Molina Healthcare of Washington (Washington State) also utilize standard care coordination procedures for most clients, though long-term clients are a challenge as each one's case is different and does not fit into one mold easily.

Organizational and Environmental Context. The organizational and environmental contexts in which interventions occur also affect their replicability. To the extent that interventions' target populations are extremely narrow, occur in unique organizations, or rely on environmental conditions that rarely occur, they will be less replicable. However, all of the MVP grantees felt that their interventions would be replicable in other settings, as long as there was organizational commitment to pursuing the intervention. Some grantees also noted that their interventions would be more easily replicated by similar organizations or with similar populations. For example, health plans felt that other health plans generally would be able to replicate their interventions, and interventions targeting highest-risk Medicaid beneficiaries with co-morbidities thought the intervention would be best suited to these types of patients.

Not surprisingly, grantees felt that many of the factors that affected their success in implementing the intervention would affect whether other organizations could successfully replicate the MVP interventions. Specifically, grantees cited leadership commitment to the intervention and its target population, availability of funding, and the buy-in of staff and stakeholders as important for others wanting to replicate these projects. Several grantees also noted that for their particular intervention, having staff dedicated solely to the intervention was important for replication.

While interventions need to be clear and well-specified in order for others to replicate them, the ability to tailor interventions to specific environmental contexts or organizational settings is imperative for success. Indeed, the fact that the two grantees (Partnership, UCSD) that used existing interventions had to modify them to fit their target populations highlights the fact that other organizations may need to do the same when attempting to replicate other MVP interventions.

Potential for Value. An intervention's potential for value—as demonstrated through an effect on outcomes or at least the perception that the intervention holds promise as potentially valuable—also affects the extent to which it is replicable. The grantees generally thought that replicating their interventions would be valuable even if they were not able to show empirical evidence on outcomes or business returns. Most grantees said the business case (return on investment) was important but only two planned to measure it following the completion of MVP.

In several cases, grantees viewed the business case as resting less on short-term gains than on long-term impact on cost or on the organization's financial strength. Because these are relatively low-cost interventions, there may be organizational returns to spending modest sums that do not justify the need for rigorous evidence of effectiveness, such as promoting innovation, demonstrating efforts to improve patient care, and generating goodwill among invested staff. Because of the way organizations operate, this could constitute a sufficient business case for leadership at sponsor organizations. In addition, the reported interest of other organizations in the MVP grantees' projects (especially case management and care coordination activities) suggests that others also perceive value from the interventions.

TABLE VI.2
KEY FACTORS THAT AFFECT REPLICABILITY AT EACH MVP GRANTEE INTERVENTION

	Standardization, Clarity, and Specificity of Intervention Activities and Protocols	**Key Organizational or Environmental Factors Influencing the Intervention (and their Uniqueness to Grantee, where applicable)**
CareOregon	Staff refined protocols and developed case management software system for managing patients with complex health conditions.	Population of high-risk, high-cost health plan clients likely available at other health plans. If client population is large, might be challenging to find and train enough staff members to provide care coordination services.
Comprehensive NeuroScience	Intervention refined by incorporating feedback from providers, but contacting clinic-based providers (and determining if they use mailings) not standardized.	Key factors include access to medical claims data, reliable information on patient's primary care providers, and staff members to visit community mental health centers (CMHCs) in person. Centralized CMHC organization (as in Missouri) might not be available in other states.
DC Medical Assistance Administration	Well-developed protocol for patient visits.	Buy-in from sponsor and care coordination staff (as is the case of Washington Hospital Center staff) is a key component. Urban setting also likely important since clients sometimes require urgent care from providers.
Johns Hopkins Healthcare	Protocols not well-specified at end of the intervention.	Coordination likely relevant elsewhere, though Maryland's capitation carve outs were unique. Success requires case management staff and relevant agencies agree that MH/SA problems need to be resolved before medical outcomes can be achieved. The size of the relevant population will affect the potential for replication. On-site staff who can work well with other staff are a desirable component for intervention.
McKesson Health Solutions	Educational workbooks created and training for facilitators in place. (Other organizations would likely have to train their own staff to facilitate sessions).	Key factors include locating a geographic area with enough clients to make the intervention scalable, providing clients with enough chances (and incentives) to attend sessions, training staff in facilitation techniques, and receiving buy-in from leadership to commit to conducting many sessions with small group sizes.
Memorial Healthcare System	Health navigator role (and roles of disease management staff) and protocols specified.	Number of patients in this intervention was small due to Medicaid reform, but might be larger for other plans. Reaching a larger number of clients will require more than one navigator to provide an appropriately intense intervention.
Partnership Health Plan	PHASE materials created by Kaiser were used for this intervention. (Participating clinics modified intervention to fit their individual needs.)	Centralized means of data collection would facilitate replication (and monitoring) by other organizations. Technical assistance to clinics and engagement of multiple clinic staff members required by intervention sponsor to ensure delivery of services.
University of California, San Diego	Existing Project Dulce and IMPACT materials used for this intervention. (Intervention modified for uninsured clients who could not pay for services.)	Key components include funding to provide care to uninsured and integration of depression care manager with existing diabetes care management staff, including an understanding of roles for recruiting patients into the intervention.
Washington State DSHS	Care coordinators use standard procedures for most clients; but each long-term care client had unique problems that did not have standard solutions.	Key elements include community (and Medicaid) buy-in to new model of service delivery and phasing in all elements simultaneously. All ABD clients (in one county) were eligible (opt-out design), creating an incentive for health plan to manage clients.

VII. CONTRIBUTION OF CHCS AND MVP AS A COLLABORATIVE

This chapter assesses which aspects of CHCS's direct support grantees considered most helpful, and how grantees perceived that CHCS's direct support and technical assistance affected (or did not affect) their interventions. It also gauges the perceived value of the MVP collaborative structure on the grantees' interventions and capacity for future work, and grantees' perceptions of the value of the MVP funding in terms of the grant money itself and having Kaiser Permanente as the collaborative's primary sponsor.

Grantees generally provided positive feedback about the value of the support provided by CHCS and the MVP structure. The structure provided by MVP (including the framework for reporting measures and CHCS's role in keeping grantees on target) was the most valued area of support. Participants also found the meetings useful and the seed money important in allowing them to conduct their interventions and garner internal support. Association with an initiative like MVP, and affiliation with an organization like CHCS, also added prestige to their efforts. Grantees suggested some areas for improvement, particularly in the form of support and communication between the meetings.

A. CHCS DIRECT SUPPORT AND TECHNICAL ASSISTANCE

The MVP structure aimed to help grantees work through implementation issues by drawing on CHCS expertise and the experience of other MVP grantees and by learning about the effectiveness of their interventions. By participating in the MVP, CHCS required grantees to design their interventions with a clear target population and evaluable study design, construct process and outcome measures for evaluating their interventions, and submit their measures to CHCS on a quarterly basis. CHCS also followed up with grantees to check on how their interventions were progressing. To obtain grantee perspectives on this process, the Round 2 interviewees were asked in an open-ended way for their views of how CHCS's assistance affected the intervention.

Overall, the grantee responses show that the structure imposed on the grantees (including the framework for reporting measures and CHCS's role in keeping the grantees on target) was the most valued area of CHCS's direct assistance. All grantees but one said that the structure was a valued aspect—or the most valued aspect—of CHCS's direct assistance. Of the nine, five grantees emphasized the specifics of the evaluation component (including the discipline of measuring and reflecting on their measures and the clear framework for submitting data) as the most valued aspect of CHCS's direct support. Three other teams emphasized the overall support by CHCS as contributing to keeping them focused and on track, for example by asking helpful questions or checking up with grantees on how their interventions were progressing. The last grantee of the nine simply noted that the structure was the most beneficial component of CHCS's assistance, and that the grantee will take that away and learn from it how to structure other initiatives.

In addition to the structure per se, at least five grantees also noted general value of the technical assistance given by CHCS and MPR.[1] Four grantees said that the assistance provided by CHCS and MPR helped them establish study parameters, develop useful measures, or helped with the intervention itself. Another grantee felt that CHCS gave valuable advice that helped it obtain needed data resources. Three of the four grantees who noted that CHCS's direct support helped shape their interventions or study design also noted that they valued the structured aspect of CHCS's support.

While all of the teams thought CHCS and MPR support was valuable, some offered suggestions for additional or different types of support that they would have liked. The most common request (three grantees) was for more scheduled individual technical assistance calls with CHCS and MPR. Other suggestions for CHCS included having more regularly scheduled calls to talk over challenges or gain input; hold site visits, especially early on in the process; more feedback after submitting the quarterly reports; and more hands-on manipulation of the process and outcome measures.

Despite this generally positive response, the structure of the MVP did impose some limitations, particularly due to the breadth and diversity of grantees. In our interviews, four grantees thought they differed so much from other teams in terms of their intervention or organizational structure that they did not benefit as much from CHCS expertise, it took longer for them to reap the benefits of CHCS assistance, they benefited less from the collaborative aspect of the MVP, or they did not utilize the collaborative as much as they otherwise would have. However, all of these grantees also provided concrete examples of the ways (discussed above) that they benefited from CHCS support and assistance.

B. MVP COLLABORATIVE

1. Assessment of the MVP Meetings and Calls

All ten of the MVP grantees found the meetings and calls (especially the former) to be generally helpful as a forum to share ideas and learn new ones, even though not all made concrete changes to their interventions based on what they learned. The benefits mentioned most included providing helpful insights or other material that broadened their knowledge base (three grantees); enlightening presentations, especially on the Return on Investment (ROI) (three of the four grantees noting this feature); and the general educational nature of the collaborative meetings that allowed them to learn from the speakers, particularly those who discussed health care delivery systems, available functional status and assessments, and an integrated approach to care coordination. Finally, two teams noted that the meetings helped foster senior staff support for their interventions.

[1] We did not specifically ask about MPR's support. However, because MPR worked closely with CHCS in establishing the structure and reviewing accomplishments, grantees saw the MPR work as part of the MVP and often commented on MPR's role in responding to our queries about CHCS and the MVP overall.

a. Effect on Interventions

More than half the grantees (six) said the meetings and calls were a source of substantive change for their interventions. The MVP in-person meetings and group calls aimed to help the grantees make concrete changes to their interventions or study designs, think further about their interventions, and provided grantees with a forum to share ideas and learn new ones. Grantees also noted that the meetings and calls had "spillover effects" beyond the MVP intervention onto their other projects or future work.

Three grantees said they made concrete changes to their interventions or study designs based on information they learned during the group calls and meetings. One grantee said that it learned about the PHQ-9 at the first MVP meeting, and has since incorporated this into its intervention. Another team said that the questions asked during the meetings and calls pushed it forward with its data analyses. A third grantee said that talking with other grantees at the meeting enabled it to refine its quarterly mailings to providers.

Three other grantees said that the meetings or calls made them think more about their interventions, even though they did not make any concrete changes to their interventions based on what they learned. For example, one grantee noted that it received feedback and confirmation from another grantee at a meeting on its approach on the mental health risk adjustment it was using, but did not need to make any changes since the feedback indicated that its approach was reasonable. A second grantee noted that talking to MPR about measurement during the first meeting was very helpful. A third grantee noted that a meeting presentation by another grantee on ROI "stimulated thought on whether we could include that in our project" and they "learned a lot that we took back to consider regarding the intervention design and what we could measure."

Some grantees also said that the meetings were beneficial to their other work beyond the MVP project. One grantee noted that it learned about a self-efficacy tool from another grantee at one of the meetings, and now uses that tool in two of its other programs. Another grantee said that the meetings, particularly information learned from the speakers, definitely had "spillover effects into our other work."

b. Areas for Improvement

While all of grantees found the meetings to be beneficial, some offered suggestions on how they could be improved. The most common suggestion (noted by five grantees) was for more opportunities for contact between meetings to keep grantees updated and connected. While three grantees requested more group calls between the meetings, two grantees said that the MVP group calls were not that useful for their team, and three other grantees offered alternative suggestions to the conference calls. Ideas to help stay connected in lieu of conference calls included newsletters or webcasts, so that there would be a visual element to the idea-sharing. One grantee suggested that even though it might not have been feasible for the MVP, a local structured collaborative that met monthly would have been good. Although the meetings were most often noted as being helpful or beneficial, no grantees thought that there should have been more in-person meetings (three grantees offered that they thought the number of in-person meetings was sufficient).

Additionally, some grantees offered suggestions on the meeting structure and presentation format. One grantee suggested that the meetings be structured as workshops rather than as a mini-conference (fewer presentations and more interactive sessions to allow more time for problem-solving and idea-sharing between grantees). One grantee also suggested more latitude in terms of the presentation format it had to follow (for example, to be able to share what it had learned from its intervention rather than having to present in a specified, "formulaic" way).

2. Contribution to Grantees' Capacity to Implement Interventions

The collaborative also contributed to grantee capacity by facilitating networking among grantees and enabling grantees to develop partnerships with other organizations, either for the MVP intervention itself or for future work.

Most teams said that the MVP collaborative structure enabled them to network with other grantees. Seven grantees specifically cited developing an official partnership with at least one other organization as a result of MVP. Five of the grantees developed these partnerships specifically for the MVP intervention itself, and one of these grantees expects to leverage the partnerships it developed for MVP for other projects in the future. Two other grantees developed a partnership with each other as a result of the collaborative, and now work together on another project separate from the MVP intervention.

3. Value of MVP Participation and Funding

Most grantees (8 of 10) said that the MVP seed money of approximately $50,000 provided to each team was important or critical to their ability to conduct their interventions. Seven teams said that the MVP seed money helped get their projects up and running or provided them with the necessary resources to carry out their interventions. Grantees noted that the grant money helped fund, for example, internal staff time devoted to MVP (particularly information technology staff), additional staff to work on the project, contracting out particular project components (such as data analyses) to an external firm, or a tangible product such as a registry or survey.

In addition, some teams (four) noted that the grant provided internal leverage to garner additional funding for the intervention, or that it would provide additional leverage to enable future research. For example, one team was able to fund two additional outcome surveys from internal resources (the MVP grant paid for the initial survey). Three other teams also said that receiving the grant money helped politically within their organizations to enable them to conduct the intervention. For example, one team said the funding helped place additional attention on the organization's case management activities among senior management; other teams noted that the funding helped ensure that the intervention remained a relatively high priority, at least during the time frame of MVP.

Further, two noted that participating in the MVP also enhanced their own organizational recognition or prestige by linking their names with the other organizations involved (including CHCS and other grantees). Two others grantees expected participation would give more

credibility to a potential publication on the results of their projects, compared with an isolated study by their own organizations.

While most of the grantees thought the funding was important in some form, three said that the collaborative aspect was even more important than the grant funding per se, and two grantees said that the prestige for their organizations was more important than the grant funding.

4. Value of Kaiser Permanente as the Sponsor

Most of the grantees (seven of the eight who were asked this question[2]) were aware that the MVP was funded by Kaiser Permanente, and five of these thought that the sponsor was important to their organizational capacity or intervention. Grantees felt that Kaiser's sponsorship was important primarily due to the potential future opportunities it might provide and because it brought prestige to their programs. Another grantee noted that Kaiser's sponsorship might add value in the future when it comes time to discuss the results of the study and increase the potential for publications. Finally, one grantee received in-kind help (in addition to the funding) from Kaiser, in the form of the idea for its intervention and fairly extensive support with implementation, which may have been facilitated by Kaiser's direct involvement as the MVP sponsor.

[2] Due to time constraints during interviews, two grantees were not asked about their awareness of Kaiser's sponsorship of the MVP.

VIII. CONCLUSIONS

MVP was formed to help expand knowledge of ways to improve care for adult Medicaid beneficiaries with multiple chronic conditions. The program succeeded in generating interest among states and health plans in developing such interventions and in building on that interest to select 10 interventions for implementation. MVP also was successful in implementation. Though progress was slower than many grantees initially hoped, each grantee was able to implement its intervention and eight had at least one year of operational experience before MVP ended. In most cases, grantees continued their interventions after the formal program ended. Further, grantees still appeared enthusiastic about their work at the end of the program and positive about the contribution made by CHCS and the MVP program structure to their efforts.

MVP was much less successful in rigorous, empirical testing of the effectiveness of the interventions. The focus on logic models and measures succeeded in generating quantitative measures on a few critical process and outcome measures. However, only two of the interventions had a sufficiently strong comparison group methodology and enough participants to support formal testing of impacts. This outcome is not surprising, given the limited resources CHCS had available to support data collection for rigorous evaluation and the limited resources available to many of the grantees.

Given the impetus behind MVP, one key question remains: What does the program contribute to our understanding on how to improve care for its target population—Medicaid beneficiaries with multiple chronic conditions? We believe the contribution has been positive on several dimensions.

First, from a process perspective, MVP demonstrated the value of using logic models and process measures to help grantees be more clear about their interventions and what they hoped to achieve. Even though MVP did not generate solid evidence of effects, the descriptive information supported by this approach will make it easier for others to learn from the MVP experience.

Second, MVP generated evidence suggesting that well-conceived efforts to better integrate care across the range of services (primary care, mental health, substance abuse, and long-term care) required by beneficiaries with multiple chronic conditions, difficult though that may be, have promise. This promise is best reflected in the Washington State Medicaid Integration Partnership but also in the Johns Hopkins care management model. Each of these aimed to modify the way benefits were used and to better integrate care across sectors of services. The interventions also were structured so that financial incentives reinforced the goals of health care services integration.

Third, the findings show that it is not just what the intervention is that matters, but also that the *intensity* of the intervention is likely to be important to improving outcomes for patients with multiple chronic illnesses. This is best illustrated by the challenges CNS faced in generating strong positive effects for what in effect was a relatively low-intensity intervention. However, other grantees also found it challenging to implement their interventions (CareOregon) or to

intervene in a way that reflected a sufficient change from standard practice that it was reasonable to expect changes in outcomes (Partnership Health Plan).

Fourth, MVP brings to light what could be some difficult or even insurmountable challenges in building a strong empirical evidence base on ways to improve care for adult Medicaid beneficiaries with multiple chronic illnesses. As MVP grantees found, many relevant subgroups are, by definition, small in number. Further, existing administrative data may not enable sponsors to identify this group reliably. Because costs for these groups tend to be high and numbers small, the power with which interventions can be tested will be constrained inherently by the chance that a single "outlier" patient with a particularly poor and costly outcome may drive the estimates of effects on costs. Utilization-based measures are less sensitive to this constraint but the shift in focus away from resource considerations could make it harder to assess the business case for interventions.

Recommendations

We believe that these conclusions highlight at least three recommendations for future attention pertaining to improving care for adult Medicaid beneficiaries with multiple chronic conditions.

First, favor multi-faceted yet well-targeted interventions with sufficient intensity to affect outcomes. The populations targeted by MVP interventions have complex conditions and multiple needs. These patients interface with the health care system in a variety of ways. CHCS may not want to promote a particular model of care (such as the chronic care model), but it would seem critical to focus on interventions that have the potential to drive change in ways that align processes to reinforce improvements in care and outcomes. Such an orientation seemed to be best reflected in the Washington State intervention and it is intriguing that this program provided the most concrete evidence.

Second, put greater emphasis on learning and design before testing. While CHCS scanned the environment prior to implementing MVP, the program was not conceived in a proscriptive fashion and allowed grantees substantial flexibility to develop their own interventions for testing. To different degrees, each of the grantees found they needed to spend substantial time defining their intervention more clearly before they could proceed. Often, changes in care processes were being implemented for the first time or conceived without benefit from existing experience elsewhere (if it existed). Diversity also limited what grantees could learn from one another or others could learn by examining the collective experience. Given the challenges illustrated by MVP in assessing the effects of interventions, we believe it valuable to spend substantially more time exploring potential interventions for their promise so that efforts and tests could be focused on those that are most promising. Rapid cycle methods are well-suited toward developing testable models, especially if complemented by a rigorous and comprehensive review of existing experience in improving care for adults with chronic illness.

Third, consider multi-site tests of the most promising interventions and convince funders to invest the resources needed for rigorous evaluation. Creating change through small-scale interventions that are narrowly focused geographically or defined such that they

reach small numbers of people, however sick they are, makes it hard to test interventions. If there are particularly promising interventions, it could be strategically of value to focus resources on bringing these to scale for rigorous testing. For example, for a chronically ill population with average annual hospitalization rate of one per patient, detecting a 15 percent difference in hospitalizations would require a treatment group of 550 or more patients (who participate in the intervention) with a randomly assigned control group of equal size. By standardizing intervention strategy (even with allowable customization by site), one can better pool results to better capture their impact. Beyond the numbers, multi-site tests also add insight on the replicability of an intervention across sites, especially if there is sufficient data to assess effectiveness at the site level as well as across sites.

REFERENCES

Bella, Melanie, Elizabeth Cobb, Joanie Rothstein, and Claudia Williams. "Environmental Scan: Health Support for Consumers with Chronic Conditions." Princeton, NJ: Center for Health Care Strategies, 2005.

Bodenheimer, Thomas, Edward H. Wagner, and Kevin Grumbach. "Improving Primary Care for Patients With Chronic Illness." *Journal of the American Medical Association*, vol. 288, no. 14, 2002, pp. 1775–1779.

Wagner, Edward H., Brian T. Austin, and Michael von Korff. "Organizing Care for Patients with Chronic Illness." *Milbank Quarterly*, vol. 74, no. 4, 1996, pp. 511–544.

Wagner, Edward H., Brian T. Austin, Connie Davis, Mike Hindmash, Judith Schaefer, and Amy Bonomi. "Improving Chronic Illness Care: Translating Evidence into Action." *Health Affairs*, vol. 20, no. 6, 2001, pp. 64–68.

W.K. Kellogg Foundation. "Promising Paths to Promoting Child Health and Preventing Obesity." Battle Creek, MI: W.K. Kellogg Foundation, 2004.

Wu, Shin-Yu, and Anthony Green. *Projection of Chronic Illness Prevalence and Cost Inflation*. Santa Monica, CA*:* RAND Corporation, 2000.

APPENDIX A

DETAILED INFORMATION ON MPR INTERVIEWS WITH MVP GRANTEES

Grantee	Interview Participants from Grantee	Date	Length (Minutes)
Round 1 Interviews with MVP Grantees			
CareOregon	Core Team (Medical Director and Manager of Program Development)	3/17/06	90
	Nurse Manager	3/24/06	60
	Chief Executive Officer	3/21/06	30
Comprehensive Neuroscience (CNS)	Core Team (Director and Assistant Directors of Outcomes Research)	3/7/06	90
	Health Liaison	3/13/06	60
	Mental Health Case Manager	3/9/06	60
	Case Manager Supervisor at Community Clinic	4/6/06	45
	CNS Senior Vice President	3/10/06	30
	Missouri Department of Mental Health Director	3/14/06	45
Johns Hopkins HealthCare	Core Team (Director of Research and Clinical Outcomes, Vice President of Care Management, and Data Analyst)	3/24/06	90
	Nurse Case Manager	3/29/06	60
	President, Johns Hopkins HealthCare	3/16/06	30
	Clinical Director, Mental Hygiene Administration, Maryland Department of Health and Mental Hygiene	3/28/06	30
Managed Health Services	MPR did not conduct first round interviews with this grantee.		

Grantee	Interview Participants from Grantee	Date	Length (Minutes)
McKesson	McKesson Core Team (Director of Strategic Marketing; Senior Director of Product Design and Development; and Senior Research Scientist)	4/13/06	90
	Associate Professor, Director of Corporate Wellness, Oregon Health & Science University (OHSU) School of Nursing	4/24/06	60
	Director of Strategic Projects for McKesson	3/23/06	60
	Vice President, Care Management Services for McKesson	5/1/06	30
	OHSU Researcher	5/11/06	30
Memorial Health System	Core Team (Manager of Disease Management and Head of Outpatient Behavioral Health Care)	3/7/06	90
	Health Navigator	3/13/06	60
	Chief Strategic Officer	3/20/06	30
	Florida Agency for Health Care Administration Representative	3/30/06	30
Partnership Health Plan	Core Team (Quality Improvement Coordinator QM & I Manager)	8/24/2006	90
	Primary Care Physician, Woodland Health Clinic	9/11/2006	60
	Chief Executive Officer and Medical Director	8/25/2006	30
University of California, San Diego (UCSD)	Associate Professor, UCSD	9/27/2006	90
	Director of Strategic Planning and Development, Whittier Institute for Diabetes	10/4/2006	60
	Depression Care Manager	10/2/2006	60
DC Medical Assistance Administration	Core Team (Washington Hospital Center Physicians, DC Medical Assistance Administration officials)	8/30/2006	90

Grantee	Interview Participants from Grantee	Date	Length (Minutes)
Washington State DSHS	Core Team (Research Manager, Medical Assistance Project Lead, and CAHPS Coordinator)	3/10/06	90
	Molina WMIP Director and Government Contracts Officer	3/16/06	90
	Molina Nurse	3/13/06	60
	Molina Executive Director	3/15/06	30
	Washington State Medical Director	3/15/06	30
Round 2 Interviews with MVP Grantees			
CareOregon	Core Team (Medical Director and Manager of Program Development)	3/14/07	60
	Care Manager	4/17/07	30
	Chief Executive Officer	4/11/07	30
Comprehensive Neuroscience	Core Team (Director of Account Management Services and Product Evaluation Director)	3/30/2007	60
	Health Liaison	3/29/2007	30
	Missouri Department of Mental Health Director	4/3/2007	30
	CNS Senior Vice President	3/28/2007	30
	Director, New Horizons Behavioral Health	4/13/2007	60
Johns Hopkins HealthCare	Core Team (Director of Research and Clinical Outcomes)	3/8/2007	60
	Nurse Case Manager	3/20/2007	30
	President, Johns Hopkins HealthCare	3/29/2007	30
Managed Health Services	Core Team (Medical Director, Case Management Director, Senior Vice President of Medical Affairs, and Statistical Consultant)	3/27/2007	60

Grantee	Interview Participants from Grantee	Date	Length (Minutes)
McKesson	Core Team (Director of Strategic Marketing and Director of Strategic Products)	4/3/2007	60
	Associate Professor, Director of Corporate Wellness, OHSU School of Nursing	4/10/2007	30
Memorial Health System	Core Team (Manager, Disease Management)	3/23/2007	60
	Health Navigator	3/21/2007	30
	Chief Strategic Officer	3/26/2007	30
Partnership Health Plan	Core Team: QM & I Manager and Medical Director	3/20/2007	60
	Primary Care Physician, Woodlands Clinic	3/21/2007	30
	Chief Executive Officer	3/26/2007	30
University of California, San Diego	Associate Professor, UCSD	3/16/2007	60
	Director of Strategic Planning and Development, Whittier Institute for Diabetes	3/19/2007	30
	Depression Care Manager	3/19/2007	30
DC Medical Assistance Administration	Core Team: Washington Hospital Center Physicians	4/16/2007	60
	Core Team: DC Department of Health Medical Assistance Administration Director	4/12/2007	60
Washington State DSHS	Core Team (Research Manager, Medical Assistance Project Lead, and CAHPS Coordinator)	4/2/2007	60
	Molina WMIP Director	4/16/2007	60
	Molina Nurse Supervisor	3/21/2007	30
	Director of Health Care Services, Washington State	4/10/2007	30

PART 2

CASE STUDIES

CAREOREGON'S CARE SUPPORT INTERVENTION

CareOregon is a non-profit Medicaid HMO in Oregon with approximately 100,000 members (including about 6,000 dual eligibles). Founded in 1993 by Oregon Health Sciences University and a consortium of safety-net providers in the area, its mission is to serve low-income and vulnerable populations in Oregon.[1] For the Medicaid Value Program (MVP), CareOregon employed a patient-focused intervention in which CareSupport teams, led by nurses and behavioral health specialists, provided case management to the plan's highest risk members (regardless of medical conditions), including dual eligibles. Typically, these patients have chronic medical conditions that are complicated by mental health issues, such as depression, bipolar disorder, or schizophrenia, or social issues such as homelessness, addictions, or lack of adequate supports.

The intervention's case management services varied in intensity, depending on the needs of each member. For example, some members may have needed fairly minimal services, such as connections to community resources or transportation to office visits, whereas others may have required far more intensive services, such as substance abuse classes, help with housing assistance, patient education, and self-management coaching. The goals of the intervention were to respond to members' immediate needs, reduce emergency room visits (particularly inappropriate or avoidable visits) and hospitalizations, and ultimately, reduce "modifiable risks" to improve health status and lower utilization costs.

CareOregon's case management intervention was not based on any single existing model of case management, but instead it drew from many programs which CareOregon staff have become familiar with over the past several years. Plan staff reported that the use of "health care guides" (typically certified medical assistants) to coach patients and help them follow their plans of care was a key aspect of the intervention, given the large proportion of vulnerable and special-needs patients served by CareOregon.

ORGANIZATIONAL CONTEXT

CareOregon is fully capitated by the Oregon Division of Medical Assistance Programs (within the state's Department of Human Services) for all services, except specialty mental health services and behavioral drugs. Any cost savings in treating plan members, therefore, accrue to the plan itself. The state of Oregon reduced Medicaid capitation rates recently (3.5 percent decrease in 2006, compared to the previous two years) and is expected to do so again in the next few years, providing added financial incentive for CareOregon to better manage its costs. Moreover, CareOregon experienced serious financial stress during the last recession and, as a result of that experience, is now paying careful attention to its highest utilizing

[1] Approximately 60 percent of CareOregon members live in the Portland metropolitan area; the remaining 40 percent are dispersed throughout 11 predominantly rural counties. According to one CareOregon senior executive, 60 to 70 percent of members' care is delivered through federally-qualified health centers.

members as "a key business imperative." By targeting those members with the greatest costs through this intervention, CareOregon staff expected to improve health outcomes while saving the plan money.

CareOregon's MVP intervention was housed within the plan's CareSupport Program. Given the plan's complex patient population, CareOregon had focused on case management for several years. However, case management has received even more attention in the past year, as recent evidence (collected as part of CareOregon's Business Case for Quality grant from CHCS) suggests that the plan's case management costs per member per month for those in active case management have decreased by 20 percent.[2] This evidence spurred CareOregon's chief executive officer to emphasize case management as a primary business strategy.

CareOregon's CareSupport Program serves its entire membership, from the large number of CareOregon members receiving care in safety net clinics to the relatively small number who receive care in community private practices. Some of the larger network providers include:

- Multnomah County Health Department, the local public health department whose clinics treat about 25 percent of CareOregon's membership
- Legacy Health System, a hospital-based clinic system
- Oregon Health and Science University, a large academic center that is both a research and delivery setting

While these organizations were not directly involved in administering intervention activities, they all treat CareOregon members through their delivery settings and were aware of the CareSupport intervention.

State Medicaid involvement in the intervention was quite limited over the course of MVP.[3] CareOregon contracts with the Oregon Division of Medical Assistance Programs to provide care to publicly insured persons in the state. CareOregon reports that the state is interested in learning the potential benefits of case management, but was not directly involved, in part due to recent staff turnover in the state Medicaid office. CareOregon staff noted that this level of participation was not a problem for its intervention.

[2] This analysis compared health care costs of those patients in active case management to those who were not, and therefore did not account for pre-intervention differences in these two groups other than their case management status. Because the intervention group in this study is simply those patients who received case management services, any cost savings may simply be attributable to regression to the mean. Nonetheless, staff described these results as "compelling enough."

[3] While Oregon Medicaid agreed to be involved in the intervention at its start, the medical director retired in March 2006, and the turnover has made it more difficult for CareOregon to involve Medicaid consistently.

PROGRAM INTERVENTION

The original design of the intervention targeted CareOregon's highest cost members as identified through a risk stratification system known as the Adjusted Clinical Group (ACG) Case-Mix Software, a tool that utilizes claims and demographic data to predict future medical expenditures. The intervention selection criteria initially set were not specific to particular medical conditions or diagnoses but defined by overall high risk as measured by an ACG risk score of 0.5 or greater. Members meeting this criterion represent the costliest 3 to 5 percent of plan membership. Before the intervention began, CareOregon estimated that the expected number of members in the target population was 3,000 to 5,000.

CareOregon initially agreed to random assignment of patients in treatment and control groups, despite the fact that many staff members were concerned about denying case management services to patients who might need them. The intent was to address staff concerns by enrolling many more patients into the intervention group than a control group. However, staff believed that continuous process improvement of its intervention was much more important than using a "rigid analytic approach," and the randomized design was never implemented.

In addition to identifying clients based on ACG scores, CareOregon also enrolled patients into case management based upon referral by physicians, nurses, hospital discharge managers, utilization management staff, and social workers.[4] The number of members receiving complex case management services was about 350 in April 2007; about 20 percent were enrolled in case management due to high ACG scores. In lieu of a control group, CareOregon drew a comparison group of patients from health plan members not enrolled in case management. From the beginning of MVP, CareOregon staff have acknowledged that its comparison group "does not provide a robust way to evaluate" its intervention.

All CareOregon network clinics have a CareSupport team assigned to help as needed with member issues and offer case management activities. The goal of these teams is to support the care provided by clinicians via a close working relationship between the clinics and the health plan. Each CareSupport team includes a registered nurse and a health care guide. All teams also have access to several behavioral health consultants, who are assigned to patients by aligning particular patient issues with consultants' area of expertise (for example, homelessness or substance abuse problems). The first CareSupport intervention team was formed in September 2005, and four additional teams existed by the end of the MVP. In addition, there was an intake team, composed of a registered nurse and five health care guides, that screened and enrolled patients into the CareSupport intervention. These teams were physically located in the health plan's main office rather than in clinics. However, by the end of the MVP, CareOregon began a pilot project that involved locating case management teams directly in five network clinics to better identify patients with needs, and plans on including this as a part of its case management activities in the future.

The health care guides were typically the first members of the intake team to contact those members identified as high risk. Over the telephone, the guides assessed each patient's needs

[4] CareOregon staff have noted that not all clients referred by outside sources had chronic medical conditions.

and barriers to care using a standardized assessment tool, which typically took about 30–45 minutes.[5] This assessment tool included questions on medical diagnoses, mental health diagnoses, and whether the patient had a functional medical home and social support structures. (For the flow of intervention activities, see Figure 1.) CareOregon staff noted that establishing a stable medical home for clients is one of its most important priorities. After the intake team identified a member for enrollment in case management, the member would then receive services via one of the CareSupport intervention teams.

Each CareSupport intervention team held meetings daily to determine how to proceed with each patient after the initial assessment and to make decisions on a patient care plan. (Team members used a formal "decision tree" to determine whether there were modifiable risk factors present, who should take the lead on the case, and what should be done first; for example, nurses sometimes had to call the primary care physician or medical director before finalizing the member's care plan if some aspect of the member's medical history or treatment was unclear.) Depending on the member's needs, a care plan may have recommended a number of activities, such as helping connect the member to needed mental health services, helping the member learn how to get the most out of physician office visits, and assessing the member's personal goals and providing coaching on disease management issues. Alternatively, the care plan may have simply linked the patient to community resources related to housing or food assistance. All case management was done by telephone, except for dual eligible patients for whom home health registered nurses may have provided home visits to complete the initial assessment, since such visits were a reimbursable benefit.

In addition to the initial assessment, health care guides from the intervention teams tended to handle many of the administrative aspects of the intervention, such as requesting records or other information from primary care physicians or determining whether the patient had been keeping scheduled appointments. This division of labor freed up the nurse's time to focus on clinical issues. In addition to dealing with clinical issues of all members, the registered nurse case managers focused primarily on the most unstable members. Finally, the behavioral health specialist on each team helped members with non-medical issues, like housing or chemical dependency (such as arranging for substance abuse treatment), which are typically immediate needs that must be addressed before the rest of the CareSupport team can address medical issues.

Staff reported that the average length of active case management was about 30 days, though clients could cycle in and out of case management for a period of time. However, the length and intensity of case management services varied depending on a patient's needs. The team followed up periodically on members that were no longer on "active status" (through telephone calls), but these procedures were not standardized. CareOregon staff also noted that connecting patients to a functional medical home may only have taken one or two brief "touches," though data on this was not reported for the intervention (see next section). The CareSupport teams prioritized patients in their caseloads based on the immediacy of need (as determined through the clinical

[5] CareSupport was an extension of CareOregon's Business Care for Quality intervention (also funded by the CHCS). This intervention, however, relied more on a team approach for these case management activities and used health care guides for non-clinical issues to allow nurses to focus on clinical issues.

assessment questionnaires and other screening procedures). Teams always prioritized provider referrals because of CareOregon's commitment to their health plan-provider relationship.

The CareSupport intervention occurred at the same time as other case management activities in some of the clinics with which CareOregon contracts. For example, the Multnomah County Health Department clinics added dedicated registered nurse case managers to their clinical teams in the past year. CareOregon staff initially indicated that activities of its CareSupport teams, which are plan-based and telephonic, were complementary to and had little overlap with in-person case management activities provided in the clinic setting. (CareSupport teams share information with clinics on the patients they are serving.) However, while plan-based case management can offer additional support and resources for both the patient and provider, CareOregon staff recognized over time the limits of offering such case management "at a distance." To bring the case management "to scale," CareOregon staff now believe they will have to directly support case management in the clinics and other delivery settings, where providers can best assess and identify patients' need of case management services firsthand.

PROCESS AND OUTCOME MEASURES

CareOregon reported several process and outcome measures related to the CareSupport intervention. Outcome measures were self-reported health status (as measured by the Health Utilities Index survey), and claims-based measures of emergency room visit rates, unplanned hospital admission rates, and average per member per month costs. (See the output and outcome boxes in Figure 1.) Process measures included the rate of completion of clinical assessment questionnaires (or home health assessments for dual eligibles) and CareSupport team rates of patient contact.

CareOregon process measure results indicate that the intensity of the intervention, though not consistent from month to month, was moderate to high (Table 1). The number of case managers contacting patients fluctuated from 7 to 21; the average number of case managers per month was about 15. The large drop in the number of case managers from August to September 2006 was due to CareOregon moving staff from CareSupport teams to the intake team (which does not provide ongoing case management). The CareSupport team structure originally included six intervention teams. As intervention activities were refined over time, CareOregon staff recognized the need for a separate intake team—whose focus was solely on patient identification and enrollment into case management—and therefore changed the team structure to five intervention teams and one intake team in August 2006.

On average, case managers had contacts with 26 members per week (or a little more than 5 per day); contacts included talking to a member about his/her health, talking with the member's primary care provider, or reviewing a member's medical records. Assuming an average caseload of 300 patients in any given month among 15 case managers, this contact rate equates to an average of 5 contacts per member per month (more than one per week). The average number of clinical assessment questionnaires completed per month was about 70 or about 14 per case management team. While these figures suggest an intensive intervention, staff also reported that early enrollees had only about one month of enrollment on average, though later ones may have

had longer exposure to the intervention. Additional data on enrollment length would provide a better gauge of intervention intensity.

To compare intervention group outcome measures to existing care, CareOregon compared plan members who did not enroll in CareSupport to the intervention group, measuring outcomes at baseline and over the first intervention year, and separating each group by ACG score at the threshold of 0.5 (Table 2).[6] However, it is likely that these two groups of patients were different

TABLE 1

MONTHLY CASE MANAGEMENT PROCESS MEASURES FOR CALENDAR YEAR 2006

	Number of Case Managers Working with Complex Cases	Average Number of Members with Contacts per Week (per Case Manager)	Clinical Assessment Questionnaires Completed
January	14	16.5	34
February	14	16.7	20
March	17	16.4	32
April	19	—	107
May	19	—	136
June	20	23.9	87
July	21	24.6	83
August	19	35.2	90
September	7	37.6	84
October	11	38.1	87
November	10	26.9	60
December	10	24.2	54
Average	**15.1**	**26.0**	**72.8**

Source: CareOregon MVP reporting template.

Note: Data on the average number of members contacted per week were unavailable for April and May 2006 at the time of this report. Case managers include registered nurses, behavioral health specialists, and health care guides.

[6] CareOregon staff have also discussed teaming with statistical research staff at another MVP grantee (Johns Hopkins Healthcare) to match its intervention group to a comparison group using observable patient characteristics, but this analysis was not available for this report. The baseline period was October 2004 through September 2005 and the intervention period was the preceding 12 months.

at baseline, not only in observable characteristics (such as health care use) but also unobservable ones (such as motivation to participate in a case management program). In fact, for most measures, the two groups were very different at baseline, even when controlling for ACG score. For example, among patients with ACG scores of 0.5 or more, average monthly health care costs were more than twice as large during the baseline period for the intervention group than the comparison group ($2,486 versus $1,150). There were also large baseline differences in costs among patients with ACG scores less than 0.5 ($810 for the intervention group and $117 for the comparison group, on average). In addition, as noted by CareOregon staff, the comparison group included patients with an ACG scores of 0 and many children, who are not a primary focus of CareSupport. These factors make inferences about the program's impact difficult to ascertain.

TABLE 2

CLAIMS-BASED OUTCOME MEASURES OF INTERVENTION AND COMPARISON GROUP PATIENTS, BY ACG SCORE

	Intervention			Comparison		
	Baseline	Year One	Percent Difference	Baseline	Year One	Percent Difference
ACG Score ≥ 0.5						
Health care costs per member per month	$2,486	$2,518	1.3%	$1,150	$1,123	-2.4%
Unplanned hospital admissions per 1,000 members	1,412	1,284	-9.1%	696	600	-13.8%
ER visits per 1,000 members	796	715	-10.2%	694	648	-6.6%
Total Member Months	**2,131**	**2,073**		**7,077**	**6,964**	
ACG Score < 0.5						
Health care costs per member per month	$810	$469	-42.1%	$117	$126	7.7%
Unplanned hospital admissions per 1,000 members	432	273	-36.8%	44	46	4.6%
ER visits per 1,000 members	682	632	-7.3%	359	351	-2.2%
Total Member Months	**4,509**	**4,750**		**814,149**	**811,740**	

Source: CareOregon MVP reporting template.

Note: The intervention group is made up of members with at least one month of CareSupport case management experience, while the comparison group is those CareOregon members with no CareSupport case management experience.

Comparison group dissimilarities notwithstanding, there is little evidence to suggest that enrollment in CareSupport influenced patient outcomes. Among patients with ACG scores of 0.5 or more, the measure which groups were most similar at baseline was the rate of emergency

room visits (per 1,000 members). Emergency room visits per 1,000 members fell about 10 percent in the intervention group but only 6.6 percent for the comparison group, compared with baseline.[7] However, given the problems with this comparison group (stated above), the difference in these trends is not likely attributable to the intervention; and regression to the mean cannot be ruled out as a reason for lower hospital admissions or emergency room visits.

At first glance, results appear more favorable for the CareSupport program among patients with ACG scores lower than 0.5. The intervention group's average monthly costs, hospital admission rate, and emergency room visit rate were 42, 37, and 7 percent lower in the first year of the program, respectively, compared with baseline. At the same time, costs and hospital admissions rose for the comparison group and emergency room visits fell by only 2 percent. However, these results are tempered considerably by the fact that these two groups were very different at baseline and are likely comprised of different types of patients—older, clinically complex patients in the intervention group and younger, much healthier patients in the comparison group. Therefore, the comparison group is not valid; and we cannot rule out regression to the mean as an explanation for lower costs, hospital admissions, or emergency room visits for those in the intervention group with lower ACG scores.

Evaluating the CareSupport program on these outcome measures is challenging for a number of reasons. As noted, the comparison group is not comparable to the intervention group; this lack of comparability is reflected in the differences between the two groups at baseline. Among observable characteristics at baseline, comparison group patients' monthly health care costs and inpatient admissions were more than 50 percent lower compared with the intervention group. Also, the average baseline health utilities index score for intervention group patients was nearly one-third smaller than the average score for comparison group patients (0.19 versus 0.28, not shown). Moreover, the two groups likely differed in unobservable characteristics, which might have a considerable influence on their behavior and subsequent outcomes. Implementation challenges, particularly in a steep learning curve (see discussion below), also made it unlikely (and unrealistic with even a randomized control group) for CareOregon to affect patient outcomes within one year of enrollment in case management. Lastly, with an average case management length of 30 days per patient and patients cycling in and out of case management, the intervention's intensity might not have been enough to influence patient outcomes (particularly in the short MVP timeframe). While it is possible that establishing a stable medical home for clients might result in favorable outcomes, CareOregon did not report data on establishing medical homes, so we do not know the extent to which this happened over the intervention period.

INTERVENTION CHALLENGES

CareOregon faced many challenges in implementing and studying the CareSupport intervention, resulting in a steep learning curve for CareOregon staff in general. First, staff reported that patient engagement was a challenge throughout the intervention, but that it

[7] CareOregon was unable to obtain individual-level data for each patient in the sample, so statistical tests of significance were not conducted to determine for these intervention-comparison differences.

improved somewhat when the intake team began enrolling patients into case management. Second, limited data, and questions about the reliability of those data, made it difficult to assess CareOregon's progress. Several factors compromised CareOregon's ability to report measures on its intervention to CHCS until April 2007. In particular, CareOregon went through a data system conversion process in 2006, which limited its ability to obtain data for many months. Staff found it especially challenging to convert its new case management software to manage protocols for patients with multiple chronic medical conditions, a system that it developed.

One challenge related to the intervention's team structure involved the use of health care guides. According to CareOregon staff, nurses did not use health care guides as much as they could have early in the intervention period. This occurred in part because of the additional training that nurses might have had to provide, but also because CareOregon was attempting to improve the definitions of roles of the different staff members (in managing the care of clients with multiple comorbid conditions) during the intervention, resulting in confusion (at first) as to the role of each staff member. Over the course of the intervention, CareOregon staff encouraged greater use of health care guides for a wider variety of tasks and delegation by nurses improved significantly by the end of the MVP.

A related challenge was the lack of a pre-existing, standardized set of intervention activities, and the time necessary to develop those activities and to train staff. When the first CareSupport team was formed in fall 2005, the intervention depended too much on the clinical experience of individual case managers and was not adequately standardized. Team members were unsure how to proceed with intervention activities and became frustrated. As a result, the team and CareOregon staff worked in fall 2005 and winter 2006 to develop standardized protocols and tools for the intervention. Continually refining these protocols and tools took time. Forming the CareSupport teams and training the staff also took time. In the words of one CareOregon staff member, "You can't just buy four health care guides off the shelf… [it's] hard to find people with the right fit."

CONCLUSIONS

During the MVP grant period, CareOregon made progress in standardizing what was a largely unformed set of activities at the start of its intervention. While this lack of structure initially meant a steep learning curve, staff reported many improvements and refinements since the fall of 2005. To the extent that activities are standardized, they may have a greater likelihood of being institutionalized (and being replicated by others). In addition, CareOregon has created and trained six CareSupport teams—a substantial work force that has the potential to reach many members in need (though the length of enrollment in the program and use of care guides to assist in care must be improved to influence patient outcomes). Moreover, the organization—from senior leadership down—appears committed to case management as a means of improving health status and controlling costs and it seems somewhat likely that the intervention will be sustained after the end of the MVP grant.

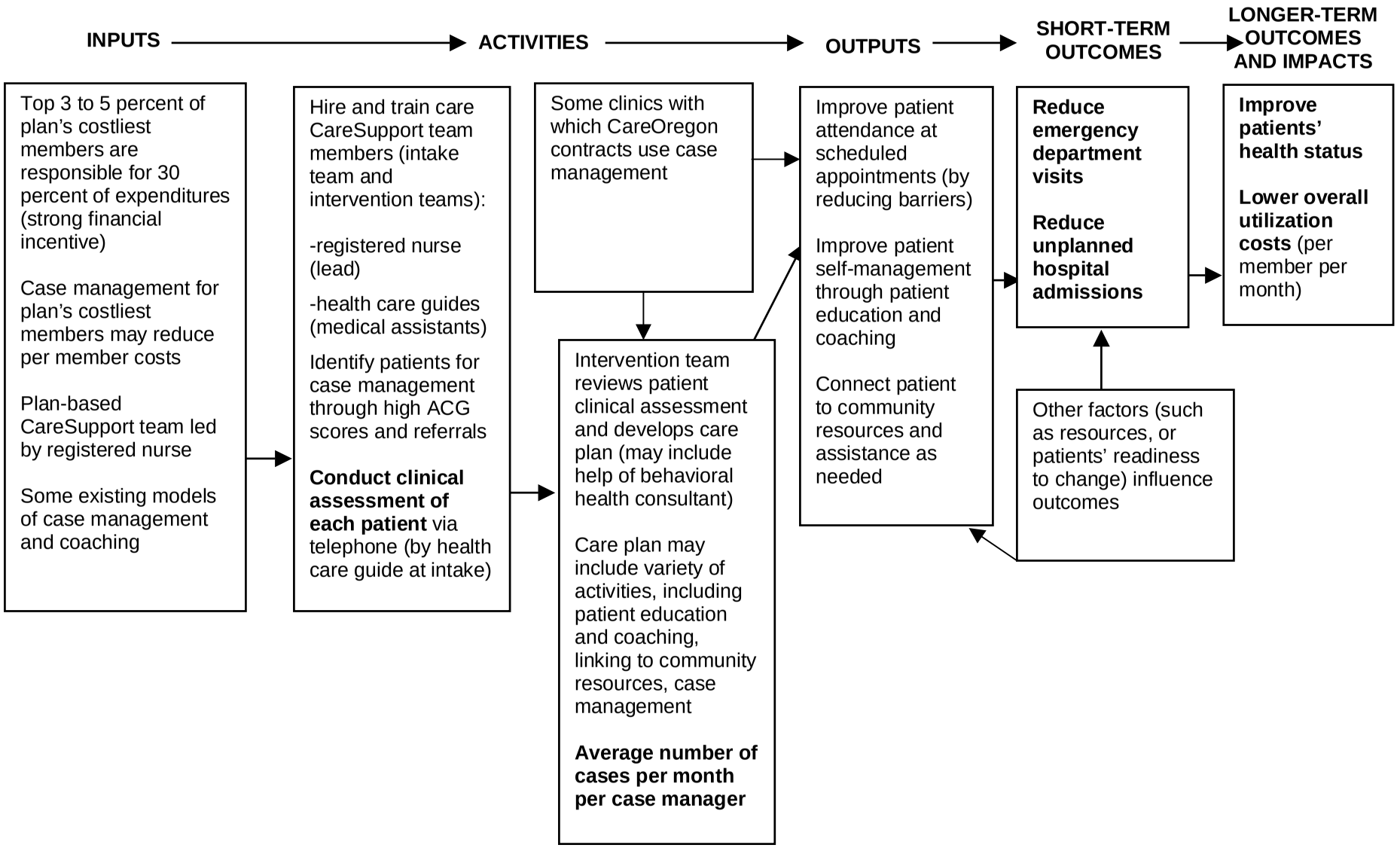
Despite these successes, CareOregon faced many challenges with its intervention, including initial reluctance of nurses to fully use and delegate tasks to health care guides, changing the structure of its case management to better manage patients with multiple chronic conditions, and

adopting its case management software to manage protocols for these patients. The plan also diverged substantially from its initial design, making the study of process and outcome measures against a comparison group challenging. Moreover, issues with data and information technology staffing resources made it difficult to track measures and understand whether those measures were accurate. Finally, the treatment period for some participating patients was as small as 30 days, though CareOregon staff noted that the goal late in the intervention period was to increase the length of engagement with clients. While CareOregon suggested (early in its intervention period) that the treatment period would be fairly short, intervening for only a relatively short period likely made it difficult to affect the outcomes of patients with chronic conditions, the target population for this intervention.

The CareSupport intervention, at least in its basic form, appears replicable in other health plan settings, provided that patient and/or provider buy-in and resources exist. CareOregon, however, has modified the team structure and intervention activities substantially over time using a rapid-cycle improvement approach, including more-defined processes and clearly-defined case management roles. Therefore, replication of the intervention would likely require documentation of intervention activities in their finalized form. Nonetheless, CareOregon staff report that other health plans find the CareSupport intervention appealing and have contacted them about the details of the intervention.

FIGURE 1

LOGIC MODEL FOR CAREOREGON'S CARE SUPPORT TEAMS



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

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

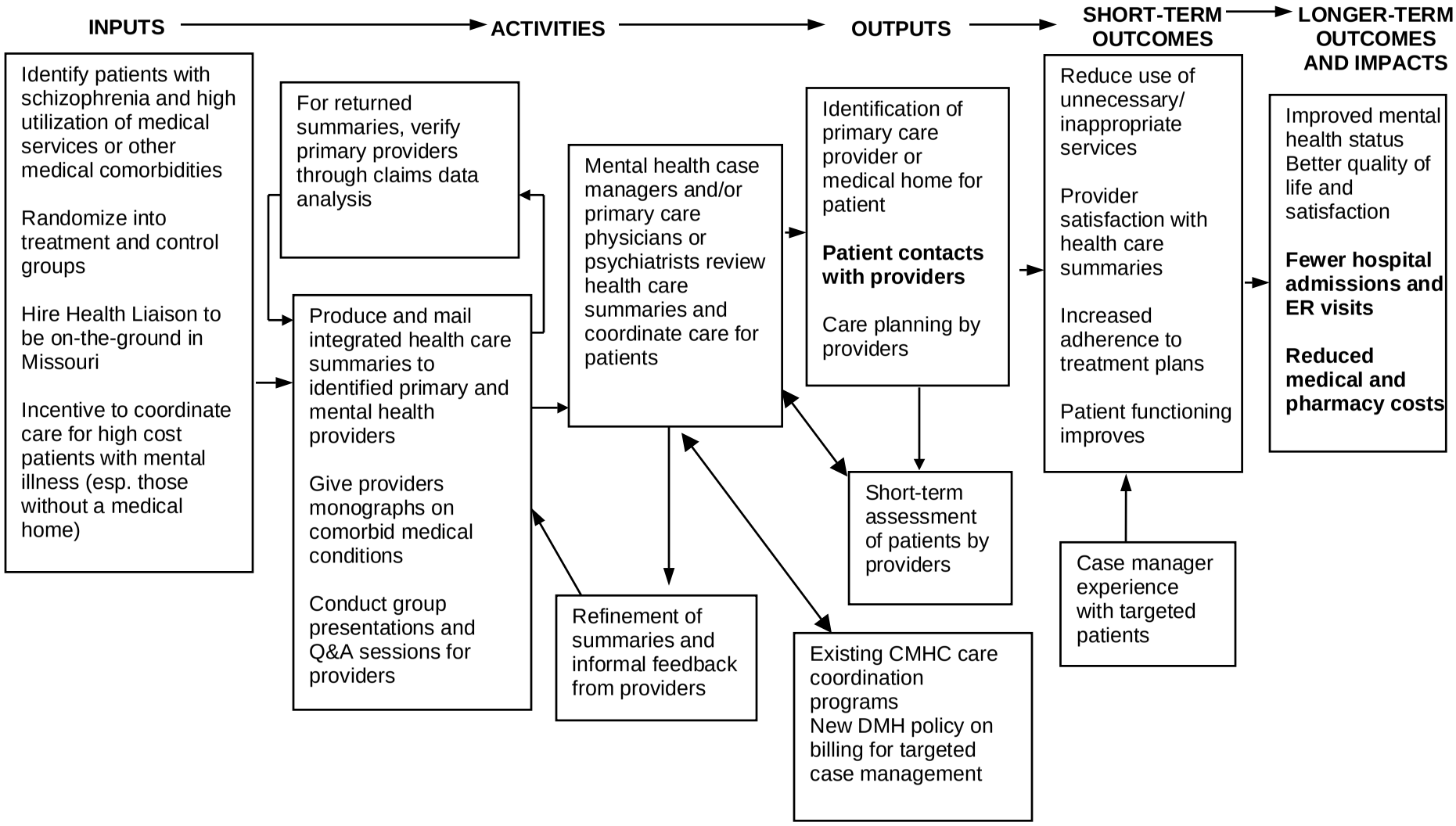
receive BPM reports, inappropriate prescription drug use could drop for both the MRM treatment and control group.

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.

DC's MEDICAL HOUSE CALL PROGRAM

The DC Department of Health Medical Assistance Administration (DCMAA), the District of Columbia's Medicaid agency, is responsible for the development and implementation of a comprehensive plan of health care service delivery for uninsured and underinsured residents of the District of Columbia. DCMAA offers case management services to the elderly and persons with disabilities under its Elderly and Persons with Disability (EPD) 1915(c) federally sponsored waiver program. This is a Medicaid waiver operated by DCMAA through the Centers for Medicare and Medicaid Services (CMS). As a part of the Medicaid Value Program (MVP), DCMAA studied and compared the effectiveness of one case management program, the Medical House Call Program (MHCP) operated by the Washington Hospital Center (WHC) to the larger EPD waiver program focusing on outcomes for elderly EPD patients and costs to the agency.

The primary objective of MHCP is to provide a medical home to persons who otherwise could not physically travel to a physician's office. MHCP care coordination teams manage all home, hospital, and community-based care for chronically-ill individuals who would prefer to reside at home rather than in a nursing home. By meeting these needs, MHCP staff also expects to reduce end-of-life hospitalizations, hospital lengths of stay, emergency room visits, and nursing home placements. WHC has operated MHCP since 1999 in Wards 1, 4, and 5 of the District, representing about 40 percent of the city's population.

Although there is little to no evidence base for this type of more intensive physician and nurse practitioner intervention, proponents argue it is a much needed "standard of medical practice" for elderly patients that deviates from traditional office-based care. The model was of specific interest to the MVP review panel because of its unique focus on what many regard as a hard-to-serve population with both disproportionate chronic illnesses and mobility issues that are not well addressed by current office-based practices.

ORGANIZATIONAL CONTEXT

As the District's Medicaid agency, DCMAA finances health care services for children, adults, persons with disabilities, and the elderly, through both fee-for-service and managed care arrangements. About 700 Medicaid clients who are elderly or have disabilities are enrolled in home and community-based services programs, such as MHCP, under the EPD waiver. At the time of eligibility determination for the EPD waiver (with medical eligibility based on a health history and environmental assessment[1]), DCMAA offers patients a choice of case management providers, including MHCP. The waiver is designed to give clients options to institutional care by providing a comprehensive assessment, case management, and personal care assistance at an annual cost of less than nursing home placement, which was about $64,000 per patient in 2005.

[1] According the DCMAA and MHCP staff, a number of forms must be submitted for the waiver program: (1) a Medicaid application and verifying documents, (2) a client health history and environmental assessment, (3) an individual service plan, (4) a long-term care form to verify a nursing home level of care is required for the patient, (5) a rights and responsibilities form, and (6) a beneficiary freedom of choice form.

Because of this high cost of care, DCMAA has a strong financial incentive to reduce the rate of nursing home placement.

WHC, a nonprofit teaching hospital, is the largest private nonprofit hospital in the District of Columbia and includes many specialty care centers. MHCP was designed by two geriatricians at WHC in 1999 to meet the clinical and social needs of the frail elderly and their caregivers, by bringing health care to the patients through house calls. The program is available to Medicaid, Medicare and non-Medicaid patients in the three DC wards which comprise the hospital's catchment area. (The largest percentages of patients are Medicaid and Medicare eligible.) The hospital complements the in-home care program with specialty care resources and an inpatient geriatrics unit where house call physicians provide inpatient care to patients.

MHCP provides a stable medical home to patients who otherwise cannot visit a physician's office without physical burden. MHCP staff reported that many patients who hear about the program welcome it as an opportunity to see a physician or nurse practitioner as they are often too fragile to visit an office, even with assistance from a caregiver. More than half of the patients in MHCP are referred by WHC, physicians, or other health care providers; patients who are also eligible for the EPD waiver program may enroll in either program first. In late 2006, MHCP served about 530 patients, roughly 20 percent (about 99 patients) of whom were also elderly EPD patients. DCMAA staff reported that more MHCP patients would have also qualified for the waiver if not for financial support from their families.

MHCP staff reported that WHC leadership is interested in increasing the quality of care and reducing the risk of hospitalization for chronically ill patients who are more likely to use emergency room or hospital services for problems a physician could treat routinely. WHC leadership supports MHCP as a way to address these needs with the expectation that payers (for example, Medicare and Medicaid) will also recognize MHCP's value and reimburse WHC for it. The program is currently funded through Medicare and Medicaid fee-for-service reimbursement for services, WHC internal support, and outside grant funding. WHC leadership also sees it as a way to compete with other hospitals in the District, increasing its client base one patient at a time. MHCP staff also reports that hospitalists and emergency department staff at WHC would like to reduce the number of frequent users of hospital services who could otherwise be managed through preventive care.

Federal reimbursement for the house call program shrunk in 2007 and WHC revenues, in general, fell during the MVP grant period. MHCP staff reported that this financial tightening, and the hospital's receipt of outside funding, led to increased attention by hospital administrators to the financial health of the institution. In particular, revenue-producing activities of MHCP physicians have come under increased scrutiny by WHC administration. However, determining which doctors are responsible for what revenue is complicated by issues such as referrals by MHCP doctors to WHC hospitalists. If the hospital-based doctor performs a procedure or service, the revenue is attributable to that physician and not the MHCP doctor who referred the patient for the procedure or service.

EPD Waiver

DCMAA offers case management services and several other services, such as personal care aides, personal emergency response service, and respite services that are available to the elderly and persons with disabilities under the EPD waiver program. Patients are eligible for the EPD waiver if they are Medicaid eligible with an income 300 percent of the federal poverty level or lower, require assistance with activities of daily living (as determined by an assessment by case management staff), and are elderly (65 years or older) or 18-64 years old with physical disabilities who qualify for Medicaid services. Roughly half of all elderly EPD patients resided in the MHCP catchment area from 2004 to 2006 (about 500 people), but only about 20 percent of that group (99 patients) had MHCP as their case management provider during the MVP grant period.

EPD waiver case management services for clients not in MHCP are supplied by a local social services agency or home health agency, and typically include only a social worker as the client's primary case manager. EPD waiver patients may also be provided personal care assistants and durable medical equipment to assist them with personal and medical needs at home. Most of the elderly EPD clients also have a caregiver or multiple caregivers who are usually family members. MHCP is the only EPD case management provider that has clinical staff to provide services.

PROGRAM INTERVENTION

As a case management option for Medicaid EPD waiver patients in the District, MHCP is designed to manage all aspects of patients' medical care and provide easy access to the health care system for patients who cannot do so on their own. Two care coordination teams provide medical and social services to elderly EPD patients in their homes. Each MHCP team consists of two half-time physicians, two full-time nurse practitioners, and one and a half full-time social workers.[2] When a patient first enrolls in MHCP, his or her primary physician conducts a health assessment. Both physicians and nurse practitioners visit patients to conduct formal client health histories and environmental assessments. Between the physicians and nurse practitioners, MHCP staff reported that there are about 16 visits per year per patient.[3] Staff attempt to visit patients no fewer than once every four weeks, making urgent care visits as needed and altering visit frequency depending on a patient's medical condition. If a patient is hospitalized, the patient's own MHCP physician monitors him/her while in the hospital. Social workers coordinate supportive services, including personal care assistants, delivery of durable medical equipment, legal aid, grief counseling, and conflict resolution.

While visiting patients, MHCP medical staff are able to assess not only patients' medical needs but also their physical environment and caregiver situation, two aspects that a physician in

[2] Physicians spend the rest of their time teaching at WHC or working on other WHC contracts. During the MVP grant period, MHCP added a third social worker to its staff who splits time between both care coordination teams.

[3] While staff primarily make visits during working hours, MHCP staff share on-call responsibilities for emergency cases on nights and weekends.

an office-based setting cannot assess. Staff report that this knowledge of the patient, the home environment, and caregiver situation reduces length of hospital stays and informs discharge planning because physicians already know much about the patient's medical history and what resources are available to patients. A typical visit to a new patient would last one hour while visits to established patients average 30 minutes. Staff note that about 25 percent of a visit is spent on patient medical assessment, while roughly half the time is used to provide caregiver support and education; the remaining 25 percent is used for patient education. Primary topics of education include medication adherence, self-care skills, and the recognition of symptoms that require immediate medical attention.

Technology plays a central role in treating MHCP patients. Each team member carries a laptop with broadband internet access to WHC's electronic health records. Although no data are stored on the laptops themselves, team members can securely access hospital records, lab values, X-rays, and records of any other services conducted at the hospital. In addition, MHCP physicians and nurse practitioners use state-of-the-art technology to provide care in the home, including portable blood testing equipment, electrocardiogram, and pulse oximetry. In fact, given the state of medical technology, MHCP staff report that the only medical activity that cannot physically be conducted in the home is major surgery.[4]

MHCP teams have several mechanisms for communication. Each team meets once a week for one and one-half to two hours to discuss unstable patients. Team members can also share patient notes using the WHC electronic health record system. When a team member signs on to the system, electronic flags indicate that other team members left them messages about a patient. For immediate communication in urgent situations, team members also communicate with pagers and telephones.

PROCESS AND OUTCOME MEASURES

For MVP, DCMAA reported both process and outcome measures for intervention and comparison group patients with at least three months of enrollment in the EPD waiver program. Process measures included both social worker and provider contacts, while outcome measures included hospital admissions, emergency room visits, and nursing home admissions, as well as hospital and nursing home lengths of stay and costs for all components of care.[5] Using Medicaid claims data, DCMAA reported process and outcome measures for calendar years 2004 and 2005, as well as the first quarter of 2006.

To examine the effect of MHCP on patient outcomes, DCMAA planned to compare house call patients to two comparison groups of patients enrolled in the EPD waiver. The first group consisted of those clients in the MHCP catchment area but not enrolled in the program, while the

[4] Due to reimbursement regulations, staff cannot provide transfusions and some antibiotics, but could provide these services if not for regulations.

[5] DCMAA had also begun to administer a patient satisfaction survey near the end of MVP and conducted focus groups with MHCP and non-MHCP social workers to collect qualitative information about MHCP and other EPD case management providers and assess their satisfaction with the program.

second group consisted of those residing outside the catchment area. From an evaluation design perspective, each comparison group had its own limitation. First, comparing MHCP patients to those within the catchment area (the first group) and who actively chose not to use the program as their case management provider would be problematic because the two groups' motivation to use the program clearly differs. Second, comparing the intervention group to patients outside the catchment area and without the MHCP option (the second group) would include patients who, if given the option, might choose not to enroll in the program.

To circumvent these concerns, we combined data reported by DCMAA for MHCP patients and other EPD waiver patients who resided in the MHCP catchment area but did not enroll in the program; only 17 percent of patients in the catchment area received the intervention (Table 1). For this study, the comparison of EPD patients who reside within and outside of the MHCP catchment area is the most valid comparison of patient outcomes. (Because the EPD waiver is a choice program, meaning participants choose the provider they want to provide care, some EPD patients within the catchment area were not enrolled in the MHCP program). However, as explained below, in large part due to sample sizes, the data reported by DCMAA for these two groups still suffers from serious problems, making inferences on the program's effectiveness difficult.

TABLE 1

HOUSE CALL PROGRAM RESEARCH SAMPLES AND AVERAGE MONTHS OF EPD ENROLLMENT

	Number of Patients	Average Months of Enrollment
EPD Patients Residing Outside MHCP Catchment Area	654	25.9
EPD Patients Residing Within MHCP Catchment Area	496	11.6
MHCP patients	85	17.9
Non-MHCP patients	411	10.3

Source: Reported by DCMAA on July 19, 2006.

Note: The figures represent patients who were enrolled in the EPD waiver, for at least three months, during calendar years 2004 and 2005 as well as the first quarter of 2006. For this report, we compared EPD patients residing outside the MHCP catchment area to those residing within the catchment area, regardless of whether or not the EPD patients enrolled in the program.

Data Limitations

The data provided by DCMAA as part of the evaluation of its MVP project was generally insufficient to make inferences about the effectiveness of MHCP and had three primary drawbacks. First, due to data availability restrictions, no pre-enrollment data were available to provide baseline measures of service utilization or costs for EPD waiver patients, compounding the problem of the poor comparison group design. While DCMAA may have had data on activities of daily living collected from EPD patient assessments, these data were not available electronically and would have been burdensome to collect for the entire comparison group

population. In interviews, staff acknowledged the limitations associated with not having pre-enrollment data and inherent differences between the intervention and comparison groups.

A second limitation of the data provided by DCMAA was that patients residing inside and outside the MHCP catchment area had vastly different average number of months enrolled in the EPD waiver. Patients within the catchment area averaged 11.6 months enrollment, while those outside the catchment area averaged 25.9 months, nearly the whole time period spanning the 27-month reporting period provided by DCMAA. This large difference in the number of months enrolled adds to the challenge of interpreting patient outcomes as it is not possible to infer whether or not length of time had an influence on those outcomes. Clients with larger tenures in the EPD waiver will have had more of an opportunity to stabilize their health than those with shorter tenure. A more favorable approach to analysis would have been to report the first 6 (or possibly 12) months of enrollment in the waiver for a subset of patients. In this scenario, the time periods which patients were exposed to the waiver would be more equivalent, allowing for a more meaningful comparison.

Third, fewer than 100 elderly EPD waiver patients were enrolled in MHCP from 2004 through the first quarter of 2006 and actually received the intervention. This small sample size makes it difficult to detect any differences between intervention and comparison groups, particularly since less than 20 percent of patients within the MHCP catchment area were enrolled in MHCP.[6] According to DCMAA, many elderly MHCP patients do not qualify for the Medicaid EPD waiver because they receive financial assistance from family members.

Process Measures

Process measures reported by DCMAA included case manager and provider contacts with patients to provide an indication of how level of care under MHCP might differ from the usual care of EPD waiver patients. In terms of the intervention, short-term increases in physician and nurse practitioner visits might reduce the likelihood of emergency room use and inpatient admissions if MHCP staff are able to manage patients' health and stabilize patients' conditions at their homes (see Figure 1).

The average number of case manager and provider contacts with elderly EPD patients in the intervention group was more than twice that for patients in the comparison group over the time period examined by DCMAA (Table 2). Across both groups of patients, the average number of contacts was low—less than one contact a month. Patients had more case manager contacts than provider contacts in all parts of the District. Due to data limitations noted above, we cannot conclude that differences across the two areas were due to MHCP. However, the overall trend in contacts is a promising sign for the program, suggesting that perhaps it will result in additional contacts. Though, without more information and a more appropriate comparison group, it is also likely that other EPD waiver programs account for the differences as well.

[6] In addition, DCMAA did not have the ability to run statistical tests on the data to determine potential statistical significance.

TABLE 2

AVERAGE MONTHLY CASE MANAGEMENT AND PROVIDER CONTACTS
AMONG ELDERLY EPD WAIVER PATIENTS

	Patients Residing in the MHCP Catchment Area	Patients Residing Outside the MHCP Catchment Area	Difference
Case management contacts	0.62	0.25	0.37
Provider contacts	0.27	0.15	0.12
Contacts by either case manager or provider	0.89	0.40	0.49
Number of Beneficiaries	**496**	**654**	
Number of Months Enrolled	**5,775**	**16,934**	

Source: Reported by DCMAA on July 19, 2006 from Medicaid claims data.

Note: The figures represent patients who were enrolled in the EPD waiver, for at least three months, during calendar years 2004 and 2005 as well as the first quarter of 2006.

Outcome Measures

Claims-based outcome measures reported by DCMAA included hospital admissions, emergency room visits, and nursing home admissions, as well as hospital and nursing home lengths of stay. DCMAA also reported total costs and costs of personal care assistants, prescription drugs, nursing home use, inpatient visits, and durable medical equipment. These outcomes all provide a sense of how well the MHCP was implemented and whether it had an effect. For example, cost data for personal care assistants and durable medical equipment provide an indication of how physicians and nurse practitioners are able to assess all aspects of patients' health care to determine when patients require these Medicaid-covered services. Provision of these services should have a direct impact on future emergency room use, inpatient admissions, nursing home admissions and total medical costs (Figure 1), helping to stabilize patients' health to the point that they can remain at home without additional medical assistance. Moreover, there is the potential for cost savings in terms of institutional care and transportation expenses normally paid by Medicaid.

Reported outcome measures for 2004 through the first quarter of 2006 provide a mixed picture for MHCP. Patients residing within the MHCP catchment area had about 50 percent more inpatient admissions and about one-third more emergency department visits (measured per 1,000 months eligible for Medicaid) than patients in the comparison group (Table 3). Emergency room visits were lowest for the small group of MHCP recipients compared with all other patients, but there is no valid counterfactual with which to compare this group. Moreover, without pre-intervention data, we cannot tell if there may be any trends that might help us determine intervention effects.

Consistent with program expectations, intervention group patients had a lower rate of nursing home admission and days of nursing home residence than comparison group patients. In

particular, the number of nursing home days per 1,000 months for intervention group patients was 73 percent lower than for comparison group patients. While DCMAA did not provide any statistical tests, this difference is sufficiently large to suggest that the program played a role in limiting nursing home days amongst patients in the intervention group though the methodological weaknesses described above limit our conclusions.

TABLE 3

INPATIENT ADMISSIONS, EMERGENCY DEPARTMENT VISITS, NURSING HOME ADMISSIONS, AND NURSING HOME DAYS AMONG EPD WAIVER PATIENTS
(Per 1,000 Months Eligible for Medicaid)

	Patients Residing in the MHCP Catchment Area	Patients Residing Outside the MHCP Catchment Area	Difference
Inpatient admissions	44.0	29.6	14.4
Emergency department visits	181.6	134.9	46.7
Nursing home admissions	1.7	4.4	–2.7
Nursing home days	57.5	215.7	–158.2
Number of Beneficiaries	**496**	**654**	
Number of Months Enrolled	**5,775**	**16,934**	

Source: Reported by DCMAA on July 19, 2006 from Medicaid claims data.

Note: The figures represent patients who were enrolled in the EPD waiver, for at least three months, during calendar years 2004 and 2005 as well as the first quarter of 2006.

Average monthly medical costs were more than 80 percent larger for patients within the MHCP catchment area compared with those outside the area (Table 4). While this difference is likely statistically significant, the primary driver of these larger costs was costs for more hours of care provided by personal care assistants, pharmaceuticals, and durable medical equipment. This composition is a favorable sign that MHCP patients are receiving services that they require. In particular, by visiting patients in their homes, MHCP staff can assess whether or not personal care assistants and specific durable medical equipment (some of which may also be used in conjunction with pharmaceuticals) are required to help stabilize patients' health. Over the period studied by DCMAA, these measures provide some evidence that the process of MHCP works, but not that the program can influence longer-term outcomes. In truth, house call program staff noted that finding the optimal mix of care coordination team support and personal care assistant support would likely be a critical element in achieving overall cost savings for Medicaid. MHCP patients had the largest average expenditures for these services, more than 25 percent more than other clients in the catchment area and more than three times as large as clients outside the catchment area.

TABLE 4

AVERAGE MONTHLY MEDICAID EXPENDITURES AMONG EPD WAIVER PATIENTS

	Patients Residing in the MHCP Catchment Area	Patients Residing Outside the MHCP Catchment Area	Difference
Total medical costs	$3,245	$1,748	$1,497
Personal care assistant costs	$1,044	$361	$683
Pharmacy costs	$252	$139	$113
Inpatient costs	$186	$204	–$18
Durable medical equipment and supplies costs	$95	$46	$49
Nursing home costs	$66	$67	–$1
Number of Beneficiaries	**496**	**654**	
Number of Months Enrolled	**5,775**	**16,934**	

Source: Reported by DCMAA on July 19, 2006 from Medicaid claims data.

Note: The figures represent patients who were enrolled in the EPD waiver, for at least three months, during calendar years 2004 and 2005 as well as the first quarter of 2006.

CHALLENGES

This project's primary challenges were unrelated to the MHCP intervention itself, but rather were centered on low enrollment in MHCP, data availability, and its comparison group design. The number of elderly patients enrolled in both the EPD waiver and MHCP for at least three months was less than 100 from 2004 through 2006. Medicaid data prior to enrollment in the waiver was unavailable and the proposed comparison group design was not ideal. These factors made it difficult to determine if differences between treatment and comparison groups were due to the program or occurred by chance. However, despite the uncertainties surrounding the evaluation, DCMAA staff perceive that the program is beneficial for its clients.

MHCP staff noted that determining the proper way to account for their program's revenue was a challenge for the Washington Hospital Center (WHC). While the hospital has received positive press coverage on the program, financial tightening (due, in part, to shrinking federal reimbursement rates for hospitals) has created more scrutiny on the house call physician's ability to produce revenue for WHC. However, determining which doctors were responsible for what revenue is complicated by issues such as referrals by house call doctors to hospital-based physicians. Overall, as measured directly, MHCP costs the hospital more than what was originally budgeted and its direct revenues to the hospital are not as large as anticipated. On the other hand, the program generates admissions which have direct returns to the hospital, though not necessarily directly accountable to MHCP. While specific to WHC, this challenge is generalizable to private agencies seeking to implement such a program and Medicaid agencies hoping to use it as an option for clients.

CONCLUSIONS

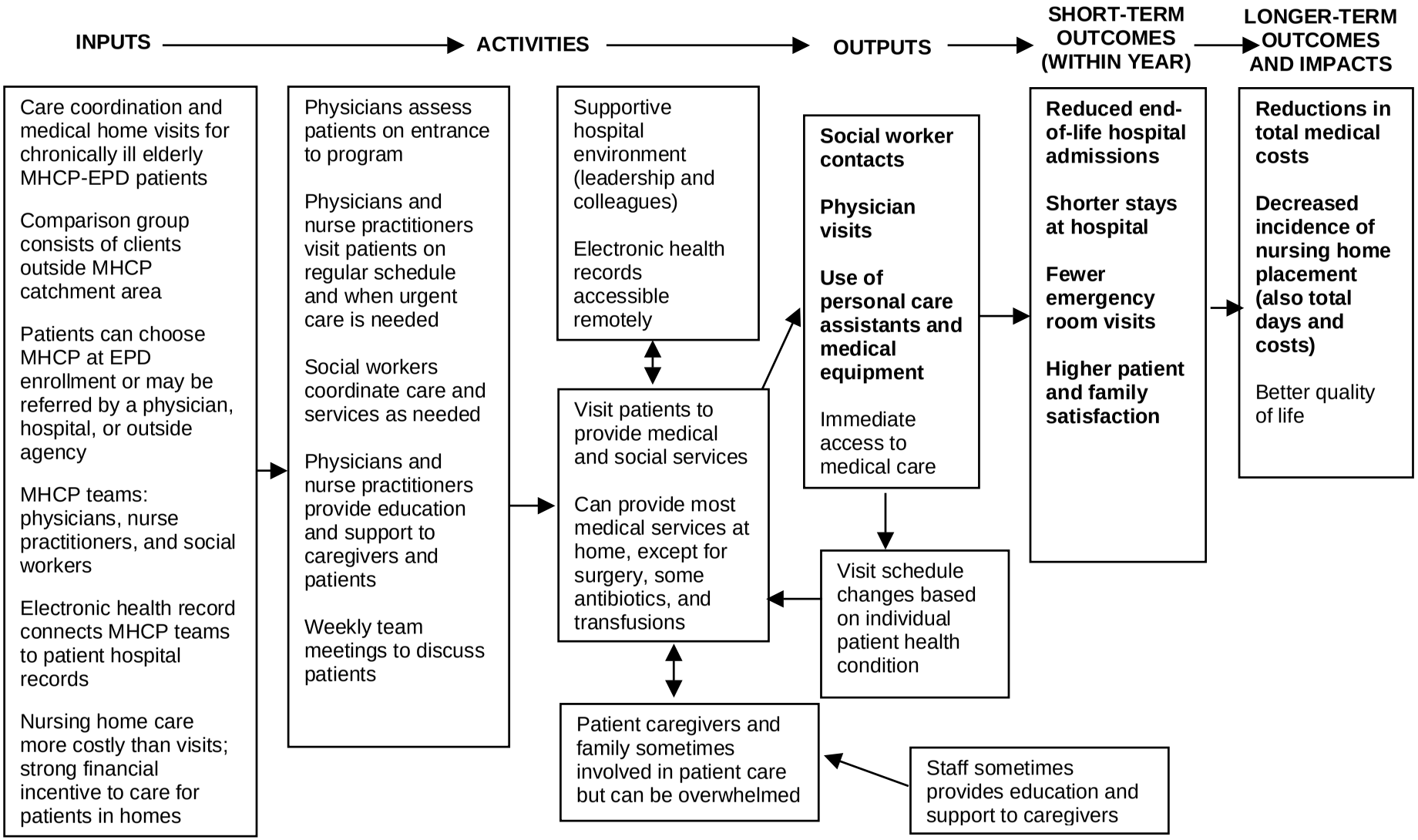
WHC's house call program is a case management program that integrates medical and social services staff to provide comprehensive care for homebound patients. MHCP medical staff have access to not only patients but also their environment and caregivers, allowing physicians and nurse practitioners to readily assess patients' needs for services like personal care assistants and durable medical equipment. Provision of these services increases the likelihood that patients' health will stabilize and reduces the chances that they will seek care for avoidable adverse events, be admitted to institutional care, and incur costly transportation expenses.

Although the program's effect on patients' outcomes was difficult to assess for MVP, MHCP is built on a care coordination model that is likely generalizable to similar urban settings with homebound clients. However, its success likely hinges on the dedication of its care coordination team members and the program's sponsor who must champion and provide leadership for it. Moreover, because this model of care is not traditional, a financing structure must be identified to account for staff's ability to generate revenue for their sponsor, particularly as it pertains to referrals. In this intervention's case, while MHCP staff reported that WHC leaders were supportive of the program from its inception, financing issues have driven administration to review the program's finances critically in comparison to its other internal, hospital-based departments. For Medicaid agencies hoping to use such a program, this challenge could be a key determinant in the type of options available to patients.

Less than ideal circumstances in terms of evaluation design and data availability made this MVP intervention difficult to evaluate on process and outcome measures. However, the house call model (essentially providing a stable medical home for patients without the ability to travel to one) deserves a rigorous assessment of its potential impacts. In an environment of increasingly shrinking Medicaid budgets, this type of intervention, at the least, might offer clients an option beyond that of expensive institutional care, which would be a benefit to resource-constrained Medicaid agencies.

FIGURE 1

LOGIC MODEL FOR DC'S MEDICAL HOUSE CALL PROGRAM



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

JOHNS HOPKINS HEALTHCARE'S INTEGRATED CARE INTERVENTION

Johns Hopkins Healthcare, LLC (JHHC) and a consortium of community health centers jointly own Priority Partners, a Maryland Medicaid managed care organization with about 116,000 enrolled Medicaid beneficiaries.[1] For the Medicaid Value Program (MVP), JHHC implemented a patient-based intervention to better coordinate care for Medicaid beneficiaries aged 21 or older with both a history of substance abuse and high predicted utilization costs. The prediction was based on Adjusted Clinical Group (ACG) Case-Mix Software, a tool that utilizes claims and demographic data to generate the probability that individual enrollees' costs will be in the top 5 percent of medical costs in the coming year. This integrated care intervention targeted Priority Partners members meeting these eligibility criteria in nine Eastern Shore counties of Maryland, and compared their outcomes to similar patients in seven other Maryland counties.[2]

The intervention employed a team approach to better integrate patients' medical and mental health care and substance abuse treatment. While patients already had formal access to case management, mental health care, and substance abuse treatment (that is, the services were either covered in the benefit package or paid for separately), many were not enrolled in these services. A major goal of the intervention was to make members aware of these services and get them enrolled as appropriate. The intervention also aimed to increase communication about patients' treatment among each patient's providers (including the primary care physician, the case manager, the substance abuse treatment provider, and the mental health provider), so each could better "break down the silos of care" and "treat the whole patient." Through better care integration, reducing barriers to better self-management of medical conditions, and linking patients to community resources as needed, the intervention aimed to reduce inappropriate or avoidable use of services (such as some inpatient admissions and readmissions), and ultimately improve participating patients' health status while reducing overall utilization costs.

To develop this intervention, JHHC drew from existing evidence on care integration from a number of sources. Given limited funding resources, however, JHHC decided that it had to create an intervention that worked largely within existing programs and services. As a result, the intervention simply focused on improving use of those services and increasing communication among those who provided them (rather than developing an intervention with new staff).

ORGANIZATIONAL CONTEXT

As a Medicaid managed care organization in Maryland, Priority Partners is paid on a capitated basis, which gives it an incentive to provide care efficiently. However, some services

[1] While Priority Partners is jointly owned by JHHC and several Maryland community health centers, JHHC manages the plan.

[2] Counties whose patients comprised the treatment group include Caroline, Cecil, Kent, Queen Anne's, Talbot, Dorchester, Somerset, Wicomico, and Worcester; counties whose patients comprised the comparison group include Allegany, Frederick, Garrett, Washington, Calvert, Charles, and St. Mary's.

are not included in the capitation rate. The benefit package in Maryland's Medicaid capitated care is constructed to balance Medicaid concerns for overall accountability and integration with the concerns of state-sponsored mental health and substance abuse programs for control over their services (Gold et al. 1999). In Maryland, mental health services are carved out (that is, Medicaid managed care organizations are not at risk for these costs). The MMCO benefit package includes medical, pharmacy and substance abuse treatment. Some of the substance abuse services are provided by state-sponsored services. With many separate sets of providers and institutions, this arrangement historically has made coordination difficult for Medicaid managed care, and the fact that many mentally ill also have substance abuse problems only compounds the challenges. Substance abuse is reportedly one of JHHC's most serious challenges in serving a portion of its Medicaid population.[3]

Like many states, Maryland's Medicaid program is under continued fiscal pressure. Maryland cut capitation rates by 0.5 percent in 2006 (which translated to about a $2 million loss in revenue for JHHC). However, JHHC also reported that the financial strength of Medicaid managed care in Maryland was improving over the period of the intervention and was strong in Priority Partners, who viewed this intervention as a potentially manageable product. Maryland's government also reportedly had diminished health department leadership over the period of the MVP intervention, as state elected a new governor, leading to change and less experience in the department's health leadership.[4]

Johns Hopkins, the sponsor of Priority Partners, has historically been a central part of the safety net for Maryland's low-income population, providing a disproportionate amount of care to Medicaid patients. Because Priority Partners has tended to attract vulnerable patients with complex needs since its inception in 1997, the organization says it devotes about 25 percent of its administrative budget to care management and coordination, which reportedly is quite unusual for a managed care organization.[5] JHHC places high priority on interventions like the MVP project, especially if it can show return on investment for such projects.[6] However, JHHC was concerned that treatment of physical conditions often is not possible until mental and substance abuse issues are dealt with, and therefore believes that getting members into behavioral health services is a high priority. As a result, organizational commitment to this particular intervention was strong.

The JHHC intervention represents an effort to better coordinate medical, mental health and substance abuse care, with enhanced communication across providers working in each of these somewhat different systems. From the mental health perspective, the intervention involves the

[3] Half of all study patients with an ACG score of 0.4 or greater had identified substance abuse problems.

[4] In November 2006, Maryland elected a Democratic governor who in turn appointed a new health secretary with substantial state experience. Although some view this as a return to more aggressive health leadership, the change occurred at the end of the MVP intervention and hence is relevant only to the future.

[5] Personal communication with Patricia Brown, JHHC President, March 16, 2006.

[6] While JHHC strongly supports case management (up to the level of the president), there remains some operational resistance to such expenditures. Senior executive staff believe that some of the operations staff do not really understand the need to spend money on case management now to avoid costs in the future, so internally staff continually need to make the "business case" for these types of projects in order to leverage internal support.

Mental Health Administration (MHA) of the Maryland Department of Health and Mental Hygiene and MAPS-MD, the statewide mental health carve-out administered by APS Healthcare. Together, these organizations formed a stakeholder task force, along with representatives from JHHC and Priority Partners. The task force generally met every one to two months to have cases currently in care management presented by nurse care managers. The stakeholders then discussed the issues that arose in care coordination and worked together on solutions, since all the organizations have the common mission to improve care for the Medicaid beneficiaries they serve. MHA provided JHHC with monthly outpatient, inpatient, and pharmacy claims data on mental health services as well as office space for the stakeholder meetings (MAPS-MD physically sent the data to JHHC as requested by MHA).

Although not official partners on the stakeholder task force, local health departments also proved useful for this intervention, we were told by JHHC staff. They helped the case managers locate members when necessary, and also served as a community resource link, helping to provide patient transportation to medical appointments as needed.

PROGRAM INTERVENTION

JHHC's integrated care intervention targeted high-cost Medicaid members (based on ACG scores) with a history of substance abuse (as identified by claims data) on the Eastern Shore of Maryland and recruited them to participate in (existing) substance abuse programs and case management.[7] The team that helped carry out the intervention included:

- ***Substance Abuse Coordinator*** (also referred to internally as the behavioral health staffer). Plan-based staff member (with a bachelor's degree and some experience in counseling) located in Baltimore who conducted outreach activities by telephone with treatment group patients. If the patient was amenable, the coordinator arranged for substance abuse treatment and/or case management (if not already enrolled).

- ***Case Managers.*** Five nurse case managers, three of whom resided in the care delivery settings of the Eastern Shore of Maryland, developed care plans for participating patients and coordinated with the patient's various providers; they also provided patient education and linked patients to community resources as needed. Patient contact was made both by telephone and in person.

- ***Specialty Care Coordinator.*** Plan-based social worker who arranged for patients' substance abuse treatment (by telephone) and coordinated that care with a substance abuse treatment provider.

As part of the intervention, the staff listed above worked to open lines of communication with participating patients' primary care physicians. In some cases, the staff also communicated

[7] This project is similar to an intervention already operating in Baltimore that JHHC developed as part of a Business Case for Quality (BCQ) grant (also funded by CHCS). This intervention is reportedly much more team-focused and has a larger mental health focus than the BCQ project.

with mental health treatment providers and substance abuse treatment providers as needed.[8] (See Figure 1 for intervention activities.) Prior to the intervention, the Eastern Shore case managers reportedly were not involved at all in substance abuse treatment or mental health services for their patients, so the focus on such services for this intervention represented a significant change. The nurse case managers saw value in having a better understanding of their patients' mental health conditions and substance abuse problems; in the words of one nurse case manager, "you can't teach an alcoholic about diabetes if they are addicted to alcohol." Accordingly, the intervention also included periodic training for the integrated care team—which occurred either in-person or via teleconference on topics like motivational interviewing, stages of change/readiness to change, and the care management of patients with pain.

The intervention began in October 2005, when JHHC sent letters to all eligible Priority Partners members residing in the Eastern Shore of Maryland who met the intervention's eligibility criteria.[9] The substance abuse coordinator located in Baltimore then proceeded with outreach calls to these members. The primary goals of the initial call were to establish a rapport with the patient and, if possible, enroll him/her into substance abuse treatment. In addition, if the member agreed to case management (and was not already enrolled), the substance abuse coordinator referred the patient to case management and contacted the appropriate nurse case manager on the Eastern Shore.

As part of the intervention, the substance abuse coordinator and the Eastern Shore nurse case managers met (starting in the fall of 2005) twice monthly for case conferences about the patients in the treatment group and whether additional management measures could be taken. The case conferences were divided into: (1) a presentation and review of a case, and (2) a didactic presentation by the psychiatrist leading the conference on clinical topics such as psychiatric disorders, psychotropic medications and the management of chronic pain. The presentation of a specific case reportedly helped orient staff away from a "medicalized" approach to treating a patient, and towards consideration of a broader set of issues—including the patient's support systems, psychosocial issues, and medical conditions. Moreover, the didactic presentations helped nurse case managers—most of whom had relatively limited background in mental health issues—to better understand the conditions of their patients.

Nurse case managers contacted patients assigned to the treatment group more frequently than their other case management patients—though outreach and other activities for those patients in the intervention were not standardized or protocolized as part of the project—due primarily to their substance abuse problems and their overall poor health.[10] Nurse case managers

[8] Typically, the integrated care team has not worked with patients' other specialist providers (such as endocrinologists or cardiologists).

[9] At the start of the intervention, JHHC recognized it had the staff capacity to include approximately 125 – 130 patients in the treatment group. Because there were 119 (originally 124, but 5 were deemed ineligible at enrollment) members in the treatment counties who met the intervention's eligibility criteria, all were assigned to treatment. JHHC, therefore, had to select a comparison group of patients from other similar counties in Maryland.

[10] One nurse case manager reported that she contacts case management participants at least once per month, but attempts to contact those assigned to the MVP treatment group at least two to three times per month because "they are involved in behaviors that are not so healthy."

tried to conduct a home visit when possible (if the patient was amenable). As a part of care coordination for the intervention, nurses also tried to get these patients to enroll in substance abuse treatment and/or mental health treatment, if the substance abuse coordinator was not successful in doing so. Finally, the nurse case managers connected the patients to community resources (such as the local food bank) as needed or referred them to a social worker on staff. Given the complex needs of patients in the treatment group, the integrated care team generally saw these patients as part of the intervention for at least one year.

In addition to the twice-monthly conferences described above, six case conferences were held with the stakeholders in the project. Specifically, Maryland's MHA hosted a Medicaid MCO (JHHC's PPMCO) and the mental health carve-out administrative services organization, MAPS-MD. The conferences afforded an opportunity to coordinate care and address systemic issues in medically managing this population.

PROCESS AND OUTCOME MEASURES

Johns Hopkins reported a number of process and outcome measures related to its intervention. Process measures included the proportion of clients in the intervention group (1) who were successfully contacted by the substance abuse coordinator or case manager, (2) whose primary care, substance abuse treatment, or mental health treatment provider was successfully contacted by the substance abuse coordinator or case manager, and (3) who received case management services, substance abuse treatment, or mental health treatment.[11] These process measures were based on data from the JHHC case management/disease management database, and provided useful information on the intervention's intensity (see the activities and outputs boxes of Figure 1). JHHC also tracked claims-based outcome measures, including medical costs per member per month, inpatient admissions (per 1,000 member months), and readmissions within 31 days of a discharge (per 1,000 member months). JHHC reported the first set of process measures for the intervention group and all other process and outcome measures for the intervention and comparison groups.

Care coordination process measures suggest that JHHC had mixed success at communications with patients and providers (Table 1). JHHC successfully contacted about 75 percent of eligible intervention group patients over the intervention period (November 2005 through January 2007). Case managers and the substance abuse coordinator contacted more than 90 percent of primary care providers for patients enrolled in case management through January 2007.[12] However, these staff had less success in contacting substance abuse providers or mental health providers, reaching them for only 41 percent and 21 percent of patients with substance abuse or mental health claims, respectively. Mental health providers were not on the panel of PPMCO providers because, as noted previously, mental health services were carved out of the MMCO benefit packages.

[11] JHHC initially attempted to measure whether communication was occurring between primary care, substance abuse treatment, and mental health treatment providers, but found that it did not have the means to collect these data.

[12] This reflects communication for patients in case management, not communication for all intervention group patients overall and does not account for the frequency of communication.

TABLE 1

CARE COORDINATION MEASURES FOR INTERVENTION GROUP MEMBERS AS OF JANUARY 2007

	Number of Patients	Percent with Successful Contact/Communication
Patient Contact with Case Manager or Substance Abuse Coordinator	124	76
Case Manager or Substance Abuse Coordinator Contact with:		
Primary care physician	48[a]	92
Substance abuse provider	38[b]	41
Mental health provider	75[c]	21

Source: JHHC MVP Workbook reported on June 11, 2007.

Note: Sample sizes for the last three measures represent the number of patients with claims in the three months ending January 2007 but sample sizes were similar over JHHC's last three reporting periods.

[a]Patients in case management.
[b]Patients with a claim for substance abuse treatment.
[c]Patients with a claim for mental health treatment.

The care integration focus of the intervention suggests that increased communication between various providers is important. Indeed, communication between the case managers and primary care physicians for intervention patients in case management was substantial, but communication with substance abuse and mental health providers (a focus of the intervention) occurred much less often. For the intervention to have a noticeable impact on patient outcomes related to substance abuse and mental health treatment, it is likely that more communication between intervention staff and specialty providers is warranted.

To compare its intervention to usual care, JHHC drew a comparison group of enrollees in other Maryland counties with histories of substance abuse but with somewhat lower (better) average ACG scores.[13] Initially, the groups included 119 (intervention) and 127 (comparison) patients, but due to attrition related to long-term disenrollment from Priority Partners or death, each group numbered around 90 patients by the end of the intervention. This comparison group is a weak counterfactual for the intervention primarily because average ACG scores were so different from the intervention group's scores. This difference is reflected in the many baseline differences between the two groups (see measures in Tables 2 and 3).[14] The dissimilarity between these two groups (and their small sample sizes) makes inferences about the

[13] The treatment group included those with ACG scores of 0.39 or higher, and the comparison group included those with ACG scores of 0.10 or higher.

[14] JHHC was able to produce a regression analysis for average costs per member month controlling for ACG scores, but other measures are not controlled for these scores.

intervention's potential impacts challenging; however, some of the trends in the data are nonetheless noteworthy.

Reported process measures on case management enrollment and the provision of specialty services to patients were generally favorable for the intervention. At one point, half of all intervention patients (not shown) were enrolled in case management, compared with a quarter at baseline (Table 2). However, at the end of the intervention only 41 percent remained in case management, with the balance leaving due to disenrollment or death. The proportion of comparison group patients enrolled in case management was flat over the intervention period and never larger than 11 percent (not shown), which was much lower than the intervention group.

TABLE 2

PROVISION OF HEALTH CARE SERVICES AMONG INTERVENTION AND COMPARISON GROUP PATIENTS AT BASELINE AND FOLLOWUP

	Sample Size		Percent with Services		
	Intervention	Comparison	Intervention	Comparison	Difference
Case Management					
Baseline	124	134	26.6	6.0	20.6
Followup	88	85	41.1	5.5	35.6
Substance Abuse Treatment					
Baseline	119	127	16.8	26.8	–10.0
Followup	119	127	31.1	25.2	5.9
Mental Health Treatment					
Baseline	119	127	53.8	51.2	2.6
Followup	119	127	61.3	53.5	7.8

Source: JHHC MVP Workbook reported on June 11, 2007.

Note: Baseline measures reflect the three months ending October 2005 and followup measures represent the three months ending January 2007.

The proportion of intervention group patients with specialty treatment was larger than in the comparison group. While different from the comparison group at baseline, the proportion of intervention group patients with substance abuse treatment nearly doubled from 16.8 percent to 31.1 percent, while the percentage in the comparison group dropped slightly (26.8 percent to 25.2 percent). JHHC staff also noted in interviews that the proportion of clients receiving substance abuse services might be underreported, as these services are sometimes bundled with mental health treatment at local health departments but billed as mental health services.

Unlike substance abuse services, the proportion of patients with mental health treatment was similar at baseline across the study groups (53.8 percent and 51.2 percent). At followup, however, the proportion of intervention group patients with mental health treatment was 15 percent larger than the comparison group (61.3 percent versus 53.5 percent). These process measures suggest that intervention group patients may have received more targeted care than the comparison group for their substance abuse and mental health problems, due to participation in

the intervention. However, it is just as likely that these differences are due to other unobserved factors or that these differences are not statistically different from zero.

For all reported outcome measures, intervention-comparison group differences were large at baseline—more than 40 percent for each measure—highlighting the fact that these two groups were dissimilar. Because of these differences, it is more appropriate to examine differences in the trends in these outcome measures over the intervention period (compared with the baseline) rather than a head-to-head comparison between the two groups. However, even this approach is suspect given the large baseline differences and small sample sizes (about 100 in each group).

Compared in this way, reported outcome measures suggest that the intervention had mixed success. For example, average monthly medical costs fell by only 7 percent in the intervention group compared with a 17.3 percent drop in the comparison group (Table 3). In a regression analysis that controlled for ACG scores (not shown), average monthly medical costs were shown to be significantly lower for the comparison group ($p < .049$). Given that the intervention sought to increase the use of certain medical services, it is not surprising to see a slower reduction of costs in the intervention group within only 15 months.

Though no statistical tests were available, the rate of decrease in inpatient admissions (compared with baseline) across the two groups was similar (30.7 percent versus 27.7 percent), suggesting the intervention had no impact on overall hospitalizations during the 15-month study period. However, the decrease in readmissions (admits within 31 days of a discharge) was more than twice as large for the intervention group (48.6 percent decline) as it was for the comparison group (21.3 percent drop). Even with the small sample, controlling for ACG scores, this last result is likely statistically significant and suggests that while overall admissions were unaffected, the intervention may have reduced the rate of readmissions significantly. Of course, it would be challenging even in a well-designed evaluation to find significant differences for all three outcome measures for such a small sample over such a short follow-up period.

INTERVENTION CHALLENGES

Johns Hopkins encountered some challenges in implementing this intervention. One significant challenge was a lack of provider communication, particularly on the part of mental health providers. While this situation reportedly improved somewhat over time, these providers still remained reluctant to share documentation and other information, in part because of patient privacy issues. As noted previously, the mental health providers were not on the PPMCO panel because of the carve-out of mental health services. This clearly limited communication (as evidenced in the process measures) and made it more difficult for the nurse case managers to do their jobs. Moreover, despite the intervention's goal of increasing communication between case managers and providers, staff noted that the amount and frequency of communication between the primary care providers and case managers was "not overwhelming." This was attributed to two causes: (1) primary care physicians reportedly often like to work autonomously, rather than have to coordinate their work with a case manager, and (2) primary care physicians had no financial incentive to cooperate with the intervention. In addition, mental health providers were concerned about privacy and reluctant to share information, though some resistance was overcome with the support of the mental health leadership.

Another major challenge was related to the nature of substance abuse itself. Patients with substance abuse problems often deny needing substance abuse treatment. The substance abuse coordinators and case managers, therefore, often had difficulty getting patients to agree to treatment. Also, staff initially had difficulty finding some patients assigned to the intervention group (in part because patients with substance abuse problems are often mobile), though local health departments aided case managers in locating these members. Family members were also not useful sources of contact information, as many intervention patients had broken family ties. In addition, at the start of the intervention, patients did not understand why they were being contacted by plan staff in Baltimore (rather than their local case managers), but this improved somewhat when the Baltimore staff and the nurse case managers began to more fully integrate their work. Some members identified as having a substance abuse problem were prescription drug abusers (often taking medications for chronic pain), and denied that they had a substance abuse problem. Consequently, there were the added challenges of assisting the member to recognize the problem and, secondly, to address it. During the intervention, nurse case managers identified a number of patients with these traits and JHHC has responded by starting a pain management initiative.

Two aspects of the study design were also problematic. First, the intervention began with relatively small numbers (119 in the intervention group and 127 in the comparison group). Over time, there has been more than 25 percent disenrollment from the intervention (because of death, imprisonment, or otherwise being disenrolled from Priority Partners for a substantial time period). The small sample size of the intervention contributed to the difficulty in detecting statistically significant differences between the intervention and comparison groups. Second, the comparison group and the treatment group were not comparable to one another in terms of many measurable outcomes. JHHC used different threshold ACG scores for the intervention and comparison groups (0.39 and 0.10, respectively) in order to obtain groups of approximately equal size. The lower average ACG scores of the comparison group, however, meant that members of the comparison group were healthier than the intervention group, thereby compromising its comparability.[15] Also, whereas the intervention group counties of the Eastern Shore were generally quite rural, some of the counties selected for inclusion in the comparison group were less rural and even have suburban or urban components, likewise affecting comparability.

CONCLUSIONS

JHHC's project addressed a key area of concern in Medicaid: the integration of physical health, mental health, and substance abuse care. While the intervention did not remove all the adverse financial and structural incentives that serve as barriers to integration, it did strive to surmount them. While JHHC concluded the intervention in January 2007, there are certain aspects of the intervention that appear sustainable for a few reasons. First, the nurse case

[15] Total per-member per-month medical costs and hospitalization rates were more than 40 percent higher in the intervention group relative to the comparison group in the pre-intervention period. In addition, there may also be some environmental factors that differentially affected the provision of care across these two sets of counties. For example, in the pre-intervention period, enrollment in case management services appeared higher among intervention counties relative to comparison counties.

managers in the Eastern Shore have become aware of and trained in the idea of care integration. The concept seems to have been institutionalized in that setting, and the nurses reportedly understand the futility of trying to deal with medical problems before the more fundamental issue of substance abuse is tackled. Second, the fact that the intervention worked within the existing infrastructure (using existing case managers) meant that it required little in the way of direct funding. Accordingly, the nurse case managers can continue serving many of the same patients in the future. Intervention activities, such as integrated team meetings, were replaced by the permanent presence of a behavioral staff person in the Complex Medical team. Behavioral health topics and those pertaining to nurse-patient interactions have been a core theme in the monthly clinical training meeting for the entire Care Management Department. The conference calls and in-service training by the psychiatrists have concluded.

JHHC's integrated care intervention was in place for approximately 15 months, allowing a substantial amount of time to track process and outcome measures. JHHC was able to provide these measures for several quarters and did not face major challenges with reporting. This may be due in part to the fact that organizational interest in and capacity for measuring process and outcome measures was high. However, the comparability of the comparison group, along with the relatively small sample size of the intervention, limited the capability to measure the intervention's success in meeting its objectives.

The primary challenges faced by the intervention involved provider cooperation and patient resistance. Provider cooperation in terms of reporting sensitive patient information appears to have improved somewhat over time. While patient resistance is an issue that is likely inherent to any intervention targeting substance abusers, JHHC also had to engage patients by telephone. Some patients initially balked at speaking with case managers over the phone, but eventually became engaged as case managers persisted. JHHC has taken a first step towards engaging the population by starting a pain management initiative—a common comorbidity of substance abusers that JHHC case managers identified during the intervention.

The problem of patient engagement also raises the question of whether or not a telephone-based intervention was the appropriate mode for a population with high levels of substance abuse. However, enrolling as many as half of all eligible clients in case management at any one time is actually a noteworthy accomplishment for such a challenging population. This suggests that a dedicated case management staff willing to contact patients often is an important component to engaging patients. And, at least in the short term, some process measures (use of substance abuse and mental health treatment services) did improve for the intervention group, suggesting with more time long-term measures might also be affected.

In terms of replicability, the intervention is more replicable in a general rather than a specific sense, given that JHHC did not explicitly standardize and protocolize its case management approach for intervention patients. In the words of one JHHC staff person, "It's not replicable in the sense of 'here's the manual, here's what you do'." However, the intervention's underlying idea of care integration is highly replicable, and JHCC has received several inquires from other health plans about this work.

REFERENCES

Gold, M.R. and J. Mittler. "Slice, Dice or Blend: Medicaid Managed Care and Behavioral Health." *Abstract Book of the Association for Health Services Research Meeting.* 16: 132. Washington DC: Mathematica Policy Research, Inc. 1999.

TABLE 3

MEDICAL COSTS, HOSPITAL ADMISSIONS, AND READMISSIONS AMONG INTERVENTION AND COMPARISON GROUP PATIENTS AT BASELINE AND FOLLOWUP

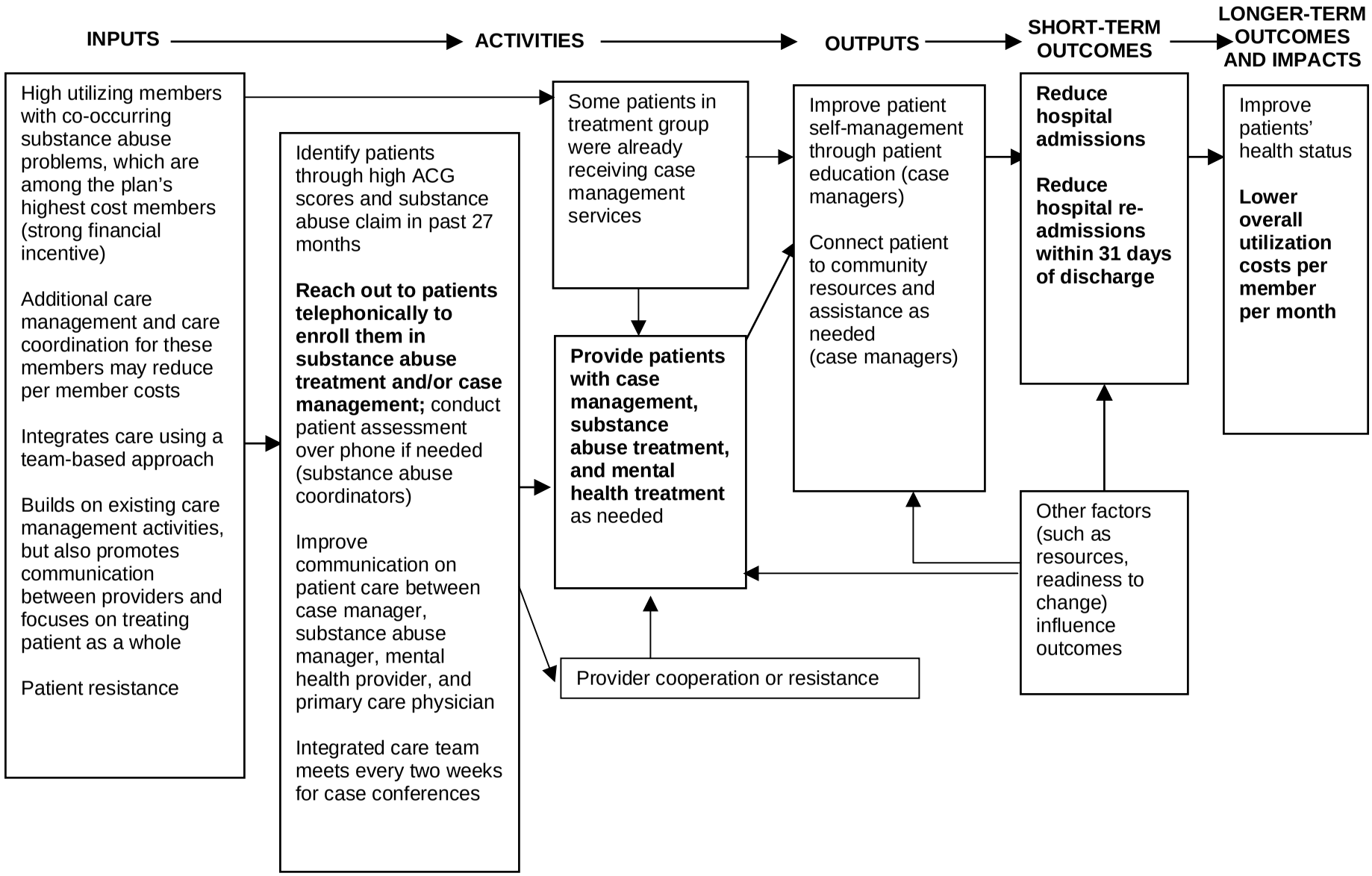
	Intervention Group				Comparison Group			
	Sample Size	Baseline	Followup	Percent Difference	Sample Size	Baseline	Followup	Percent Difference
Average monthly medical costs per member per eligible month	119	$2,826	$2,629	–7.0	127	$1,611	$1,332	–17.3
Inpatient admissions per 1,000 eligible member months	119	1,715	1,189	–30.7	127	947	685	–27.7
Readmission per 1,000 eligible member months	119	418	215	–48.6	127	225	177	–21.3

Source: JHHC MVP Workbook reported on June 11, 2007.

Note: The baseline period was November 2004 to October 2005 and the follow-up period was November 2005 to January 2007 (the entire intervention period). Statistical tests controlling for ACG score at baseline confirm that the trend in average monthly medical costs for the intervention group was significantly different from the trend for the comparison group ($p = .049$). Hopkins chose to conduct a statistical analysis for only this variable.

FIGURE 1

LOGIC MODEL FOR HOPKINS'S INTEGRATED CARE INTERVENTION



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

MANAGED HEALTH SERVICES' MVP PROJECT

Managed Health Services (MHS), Wisconsin's largest Medicaid health plan, is a for-profit health maintenance organization (HMO) that has provided health care services to Medicaid and BadgerCare recipients (children and parents) in central and southeastern Wisconsin for 20 years. In April 2005, MHS began providing services to Medicaid SSI clients in Milwaukee County.[1] For the Medicaid Value Program (MVP), MHS compared two health risk assessment tools used to determine case management placement for SSI clients: a Predictive Risk Report (PRR) based on historical claims data, and the state-required Health Risk Assessment (HRA), a telephone-based interview tool (that some have criticized for its burden and cost). MHS began using the PRR for case management decisions in April 2006. The project team studied the association of these tools with case management placement for 3,000 SSI clients enrolled from April to November 2005, using multivariate regression analysis.[2] MHS also conducted a factor analysis of HRA data to investigate whether it would be possible to reduce the number of HRA questions and still retain pertinent information needed for case management placement. In addition, while the emphasis was on case management decisions, MHS also studied the relationship between case management and patient hospitalizations and emergency room visits.

The HRA and PRR assess patients' health risk through different means. The HRA is a questionnaire administered to Medicaid clients by telephone after enrollment (as required by the state of Wisconsin for all Medicaid managed care enrollees).[3] Patient-reported responses are then used to compute a risk score. MHS staff report that a major disadvantage of the HRA is that it can take as much as 45 minutes to complete. In addition, reaching SSI clients by telephone is often difficult because as many as 60 percent have either no telephone contact information or disconnected telephone numbers.

The PRR uses administrative claims data to provide estimates of future utilization and costs. The primary advantage of the PRR is that it identifies high-risk clients without having to assess risk or track down clients first by telephone, but it also has disadvantages. In particular, the PRR may not provide an up-to-date assessment of a patient's current health risk because there is a lag between claims' dates of service and the period when claims data are available. In addition, claims-based risk scores cannot be calculated if clients have no claims data available.[4] The differences in time frame between the two methods (with the HRA reflecting current health status and utilization and the PRR reflecting past utilization) also complicate the interpretation of the relative merit of the two approaches to risk assessment.

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[1] During the MVP grant period, MHS also began providing services to SSI clients in Racine, Waukesha, Kenosha, Washington, and Ozaukee counties.

[2] Because this project differs from the others in the MVP collaborative and is not an intervention per se, we do not include a logic model as part of this summary.

[3] Completion of assessments is mandated by federal regulation: 42 CFR Sec. 438.208(c), but not within a specific time frame after enrollment.

[4] For example, if clients were ineligible for Medicaid during the 12 months for which claims data are used to calculate the PRR.

Although Wisconsin Medicaid did not participate directly in this project, it did provide Medicaid claims data in-kind, which MHS used to calculate outcome measures for hospital and emergency room use. Wisconsin Medicaid also produced and distributed PRR data to MHS and the other plans that care for SSI Medicaid clients.[5] MHS staff noted that without Wisconsin Medicaid's support, "the project would not have been possible." Going forward, MHS plans to share the results of its study with Medicaid officials who MHS says are interested in learning about the use of the PRR to identify clients in need of case management.

DETAILS OF RISK ASSESSMENT TOOLS

Predictive Risk Report (PRR)

The PRR provides 21 measures of a patient's risk of high health care expenditures relative to other Wisconsin Medicaid SSI clients, all based on 12 months of Medicaid claims data.[6] Risk measures are calculated for the following:

- Ambulatory-sensitive conditions (diabetes, respiratory diseases, heart diseases, and gastric diseases)
- Mental health and substance abuse care (outpatient and inpatient treatment)
- Functional status (limited activities of daily living and instrumental activities of daily living)[7]
- Health care utilization (outpatient, emergency room, inpatient, and prescription drug use)
- Four summary measures:
  - The predicted level of health care expenditures in the next year
  - The predicted risk of having health care expenditures in the top 5 percent of all SSI clients in the next year

[5] For information on the design, production, and distribution of the PRR by the Wisconsin Medicaid program, see the interview with Mike Fox in Johnson, S, M. Lodh , M. Fox, L. Dunbar. "CHCS Network Exchange Call Summary: Current Applications of Predictive Modeling in Medicaid Managed Care." Center for Health Care Strategies, April 2005. Available at http://www.chcs.org/publications3960/publications_show.htm?doc_id=274475. Accessed June 16, 2007.

[6] MHS contracted with APS HealthCare (APS) to provide statistical consulting services for this project. The Wisconsin Department of Health and Family Services (DHFS) partnered with MHS in this study to provide Medicaid data, including the PRR, enrollment, and outcomes measures. APS is a specialty and behavioral medical care management company that has provided services to Wisconsin Medicaid for more than 10 years. Due to claims data processing lags, DHFS calculated PRR risk measures in April 2006 using data from October 2004 to September 2005. If patients were eligible for Medicaid for fewer than 12 months, DHFS calculated PRR measures using data only from the months in which patients were eligible.

[7] Screening for functional status is a requirement for patients participating in some health-related public programs in Wisconsin.

- The predicted risk of having an increase in health care expenditures from one year to the next that is among the top 10 percent of all increases
- The Chronic Illness and Disability Payment System (CDPS) score

For each risk measure, patients are assigned a "consumer percentile" and a "risk rating." The consumer percentile is a percentage from 1 to 99 that ranks that patient's risk relative to his or her peers (relative to all adults with disabilities in Wisconsin). The PRR assigns consumer percentiles above 75 percent a "high" risk rating, those between 50 and 75 percent a "medium" risk rating, and those below 50 percent a "low" risk rating.

Health Risk Assessment (HRA)

The HRA questionnaire collects patient self-reported data on disease state, function (for example, activities of daily living), utilization services (for example, how often the client visits a doctor), and dependency (for example, primary reason for client disability). HRA questions pertaining to a client's health care history, use of health care services, or self-care skills have a point value of 1, 20, or 100. (For example, the use of diabetic supplies at home is 20 points, and three or more hospitalizations in the past year is 100 points.) Point totals are reflective of a client's need for case management. Thus, major health risk indicators are assigned the largest point value: 100 points.[8] MHS sums all points for each patient and assigns scores of 400 or more a "high" risk rating, 100 to 399 a "medium" risk rating, and 0 to 99 a "low" risk rating.[9]

For MVP, MHS collected HRA data using a version of this tool that had been designed for the SSI population. However, as a part of MVP, MHS also investigated the possibility of reducing the number of questions in the HRA to decrease the amount of time associated with data collection. Based on an analysis of item correlation between the HRA and PRR, MHS reduced the number of questions in the HRA from roughly 56 to 31, a reduction of nearly 45 percent.[10] MHS began implementing the new HRAs in December 2005 and, though it did not directly measure the amount of time each took, staff noted that there was a reduction in HRA completion time. The data included in this report represent data collected from the initial version of the HRA, not the updated one.

The newest version of the HRA, like the previous version, still includes areas that are mandated to be collected by the state of Wisconsin. These areas include diagnosis and health-

[8] Five responses are valued at 100 points each. Three of them are for activities of daily living (client requires help with taking medications, eating, or using the bathroom), and two are for health care utilization in the past year (three or more hospitalizations or three or more emergency room visits).

[9] NurseWise collects HRAs for MHS. Like MHS, NurseWise is a subsidiary of the Centene Corporation, a managed care organization with Medicaid HMOs in Indiana, New Jersey, Ohio, Texas, Georgia and Wisconsin. NurseWise provides a broad range of health-related services including Nurse Advice Line for triage, approval of urgent pharmacy refills, transportation for treatment, and crisis interventions.

[10] Some questions on both versions of the HRA contain multiple parts. For example, one question asks if patients have ever been told by doctor that they have one or more of eight medical conditions.

related services, mental health and substance abuse, demographic information (ethnicity, education, living situation/housing, and legal status), instrumental activities of daily living, overnight care, communication and cognition (ability to communicate memory), indirect supports (family, social and community network), general health, and life goals.

USE OF RISK ASSESSMENT TOOLS BY MHS

MHS used both the HRA and PRR to make case management decisions for SSI clients. From April 2005 to March 2006, MHS used the HRA exclusively and began using the PRR as its primary assessment tool thereafter. Patients with a high HRA score received first priority for case management placement. Patients who were hospitalized or referred by providers were also high priority candidates for case management, regardless of HRA score. Also regardless of HRA score, patients with established social support services (for example, personal care assistants) were not always placed by MHS into case management if the member was being well supported and had no other identified needs.

Beginning in April 2006, MHS began using PRR data and other available hospitalization data to identify the need for case management. Specifically, MHS used the PRR risk measures for inpatient hospitalization and emergency room use, but not any of the summary risk measures. In addition to using PRR risk scores, MHS also used any available information on recent member hospitalizations to make placement decisions. (HRAs were also used if they were completed.) MHS collected up-to-date hospital admission data from daily inpatient census reports and nurses' rounds that occurred twice a week. Patients with either a high risk rating on the PRR inpatient admission risk measure or a recent hospital admission (regardless of their PRR risk) were automatically assigned to case management. MHS used the PRR emergency room risk measure as an additional determinant of case management placement; patients with high risk on this measure received first priority. MHS switched its approach for making placement decisions—from using HRA data to using PRR data—because of the difficulty in contacting members by telephone, resulting in long lags between patient enrollment and a case management placement decision. However, placements made with PRR data are not included in the project's analyses of the association of PRR and HRA scores to case management placement.

MHS planned to continue using PRR risk scores to identify patients for case management placement after the end of MVP, as it feels the PRR focuses its placement efforts more effectively than the HRA. Moreover, MHS has encouraged the state to consider using PRR information on other plan populations, such as BadgerCare recipients. As mandated, MHS will continue to collect HRA data as well, but staff believes that PRR data will allow the plan to prioritize its data collection efforts on clients with the highest risks of future health care use.

STUDY POPULATION

For MVP, MHS studied the association of PRR and HRA scores to case management placement for 3,000 SSI Medicaid clients enrolled in the program between April and November

of 2005 (Figure 1).[11] HRA data were collected through March 2006 and PRR data were calculated in April 2006 using Medicaid claims data from October 2004 to September 2005. As of April 2006, 38 percent of these SSI clients had both a PRR and an HRA completed (1,130 of 3,000 SSI clients, Table 1). MHS placed 42 percent of all SSI clients (1,264 patients) into case management, though only 10 percent (129 patients) had high HRA scores, highlighting the fact that MHS used more than one criterion to determine case management decisions, including referrals, hospitalizations, caseload, and client social supports.

FIGURE 1

MHS STUDY MILESTONES

Dates	Milestone
April 2005 to November 2005	SSI clients in study sample enrolled in MHS (3,000)
	Study examined case management placements that occurred for these patients through April 2006
April 2005 to March 2006	HRA data collected for SSI enrollees
April 2006	PRR data for all SSI clients obtained, based on claims data from October 2004 to September 2005

Source: MHS and APS HealthCare.

MHS = Managed Health Services; PRR = Predictive Risk Report; SSI = Supplemental Security Income.

From April to October 2006, when MHS began using the PRR to make case management decisions, MHS completed 211 HRAs (roughly 11 percent of the population; not shown). In addition, after switching from the HRA to the PRR to make decisions, MHS increased the number of members in case management by 90 percent (1,246 to 2,405 members), primarily because patient risk measures were more readily available. Almost 90 percent of the study population had at least a PRR completed by October 2006, while only 45 percent had an HRA, highlighting MHS's concern that HRA data collection is difficult due to poor contact information for members (data not shown).

Data provided by MHS suggests that among clients with both a completed HRA and PRR, only a small proportion of clients (6 percent) had both high HRA and high PRR scores, the primary decision point for prioritizing case management placement (Table 2). Roughly one-third of clients had PRR and HRA scores that were either both classified as medium or low risk. However, roughly 60 percent of patients had HRA and PRR risk levels that were different from each other and nearly a third of the sample had a high score based on one tool but not another. Because MHS identified clients for case management based on whether or not they fell into a high risk group, it might be informative for MHS to consider various cutoffs to define high risk

[11] Case management data represent whether or not MHS opened a case for a patient and not necessarily whether or not patients remained in case management for an extended period of time. Members move into and out of case management frequently due to loss of Medicaid eligibility and lack of interest in case management services.

for both the HRA and PRR, and examine if different cutoffs result in different case management placement decisions.

TABLE 1

HRA AND PRR COMPLETIONS, PERCENT IDENTIFIED AS HIGH RISK, AND PERCENT ENROLLED IN CASE MANAGEMENT

	All SSI Clients		SSI Clients Enrolled in Case Management	
	Number	Percent Identified as High Risk by HRA[a]	Number	Percent
Both HRA and PRR	1,130	10.9	837	74.1
PRR Only	1,525	n.a.	258	16.9
HRA Only	159	16.4	123	77.4
Neither	186	n.a.	46	24.7
Total with HRA	1,289	11.6	960	74.5
Total without HRA	1,711	n.a.	304	17.8
Total	**3,000**	**5.0**	**1,264**	**42.1**

Source: MHS and APS HealthCare.

Note: Includes all SSI clients enrolled from April 2005 through November 2005 with HRA completion and case management placement followed up through April 2006. HRA scores of 400 or more receive a high risk rating.

[a]Percent identified as high risk includes those with high HRA risk scores.

MHS also conducted statistical analyses to examine the association of HRA and PRR scores to case management placement.[12] When scores were unavailable for clients, MHS substituted the mean value of the HRA or PRR for missing values. This required imputation of the PRR score for roughly 10 percent of clients and the HRA score for about 55 percent of clients.

MHS chose to use the PRR CDPS score for its analyses even though it used other PRR risk scores to make case management placement decisions. The simple correlation between the HRA score and case management placement was estimated to be .07 while the correlation between PRR CDPS score and case management placement was .10. Both suggest that only about 10 percent of the time (or less) can we expect an HRA score or a PRR score that is above the sample mean to indicate that a client will be placed into case management, suggesting (as expected) that other factors also account for placement.

[12] This analysis excluded 278 patients who had a hospital admission before case management placement.

TABLE 2

HRA AND PRR SCORES AMONG CLIENTS WITH BOTH MEASURES

	Number	Percent
Clients with:		
High risk scores on both	70	6.0
High PRR risk, not HRA risk	305	26.0
High HRA risk, not PRR risk	60	5.1
Neither high risk, but equivalent risk levels[a]	377	32.1
Neither high risk and not equivalent[b]	361	30.8
Total	**1,173**	**100.0**

Source: MHS and APS HealthCare.

Note: Includes all SSI clients enrolled from April 2005 through November 2005 with HRA completion and case management placement followed up through April 2006. These data include some clients for whom HRA data was collected after April 2006, thus the total number with both measures is slightly larger than noted in Table 1. The PRR assigns consumer percentiles above 75 percent a high risk rating, those between 50 and 75 percent a medium risk rating, and those below 50 percent a low risk rating. HRA scores of 400 or more receive a high risk rating, 100 to 399 a medium risk rating, and 0 to 99 a low risk rating.

[a]Patients who have both a medium or low HRA and PRR risk score.
[b]Patients who had low risk on one score but medium risk on the other.

Multivariate regression analysis suggests that both the HRA score and the PRR CDPS score had a small association with the likelihood of case management placement.[13] Standardized regression coefficients for the HRA and PRR CDPS score, which were statistically significant, were both roughly 5 percent (Table 3).[14] These coefficients are standardized in the sense that they account for how widely the data are spread empirically from their mean—the standard deviation. Because the standard deviations of the HRA and PRR scores were large relative to their means, these coefficient estimates suggest that for every 10 percent increase in either score there will be about a half percent increase in the likelihood of case management.[15] The standardized coefficients for two other variables (whether the HRA score was imputed and number of months eligible) were also larger in absolute magnitude than the standardized coefficients for the HRA and PRR scores, suggesting that these variables have relatively more explanatory power than either of the two assessment scores.

[13] In addition to including the HRA and PRR CDPS scores in its multivariate regression analysis, MHS also used binary indicator variables for dual eligibility status, whether the HRA score was imputed, and whether the PRR score was imputed. MHS also included the number of eligible months for each patient as an explanatory variable. MHS used an ordinary least squares regression to model the likelihood of case management placement.

[14] This indicates that for every change in either the PRR or HRA score by one standard deviation, holding all other explanatory variables constant, the likelihood of case management increases by 5 percent of a standard deviation; where the standard deviation represents how widely spread data are from its mean.

[15] As reported by MHS on October 28, 2006, the mean HRA score was 210.6 and the HRA standard deviation was 97.2 while the mean CDPS score was 1.85 and the CDPS standard deviation was 1.90.

TABLE 3

REGRESSION COEFFICIENTS FOR LIKELIHOOD OF CASE MANAGEMENT PLACEMENT

	Coefficient	Standardized Coefficient	p-Value
Intercept	0.343	0.000	<0.0001
Imputed PRR score (0/1)	0.048	0.031	0.035
Imputed HRA score (0/1)	–0.596	–0.609	<0.0001
Dual eligible	0.005	0.003	0.860
Months eligible	0.031	0.129	<0.0001
CDPS PRR Score	0.014	0.053	<0.0001
HRA Score	0.000	0.055	<0.0001

Source: MHS and APS HealthCare.

Note: Includes all SSI clients enrolled from April 2005 through November 2005 with HRA completion and case management placement followed up through April 2006.

Limitations to Study Design

The analysis MHS conducted to examine the association of assessment scores to the likelihood of case management placement has limitations that warrant consideration. First, because HRAs are difficult to collect, HRA scores were imputed for more than half the research sample. While the method used to impute scores (mean substitution) was valid, the overall results might be strengthened by an analysis of the subset of clients with non-missing HRA and PRR scores. Second, while there was a slight association between the PRR CDPS score and case management placement, it is not clear that this association is relevant to MHS as it did not use the CDPS score to make placement decisions.[16] Rather, MHS used the PRR inpatient and emergency room risk scores, as discussed above.[17] Third, the MHS multivariate analysis includes assessment scores as continuous measures while case management placement decisions were made based on whether clients were classified as high risk or not. An analysis that examines whether binary indicators of risk are associated with case management placement would be informative to decision makers who use the binary value of this risk score rather than the continuous value. Fourth, MHS reported using information on social supports as a measure that helped to determine case management placement, but this variable that provides information as to how case management decisions were made was excluded from regression analysis.[18]

[16] CDPS scores and PRR measures on hospital and emergency room use are likely correlated to some extent.

[17] MHS did provide some analysis of the association of inpatient admission risk scores with case management placement during the grant period, but this analysis was not included in its final report.

[18] In the same analysis where MHS examined the association of inpatient admission risk to case management placement, it also included social support information. However, this also was excluded from the final analysis.

EFFECT OF CASE MANAGEMENT ON UTILIZATION

Upon enrollment into case management (regardless of the tool used for placement), all patients receive services from a team of health care providers, including a registered nurse, social worker, behavioral health clinical case manager, and program coordinator. This team also has support from MHS physicians, utilization review staff, and behavioral health specialists. A patient's lead case manager is selected based on that patient's primary health condition. Registered nurses are lead coordinators for clients whose primary conditions are medical, while behavioral health clinical case managers provide case management for clients whose primary conditions are related to mental illness or behavioral health. Social workers help with care coordination functions by providing assistance related to social issues, such as finances and housing. The program coordinators work with providers who provide literature requested by the members and contact members as needed to assist the case manager.

As of April 2006, MHS had three registered nurse case managers, one behavioral health therapist, one social worker and two program coordinators on staff to manage patients placed into its case management program.[19] The main services provided through MHS's case management program include care coordination and connecting patients to social services and other resources. As of April 2007, about 300 SSI clients were enrolled in complex case management. MHS staff reported that low case management staffing levels limited its ability to enroll additional clients. Ideally, MHS would like to staff enough case managers to manage as many as 600 clients.

In addition to examining the association of the two risk tools to case management placement, MHS studied the effects of case management services on subsequent patient hospitalization and emergency room visits. MHS conducted this secondary analysis for all of its SSI clients enrolled from April to November 2005. Thus, the intervention group consisted of clients enrolled in case management and the comparison group was those clients not enrolled in case management, regardless of risk at the time of enrollment.

Results suggested that the association of case management placement to patient outcomes was small, but statistically significant, for SSI clients enrolled in MHS. However, the analysis could be strengthened by a more appropriate comparison group, as the current group—MHS SSI clients without case management—is likely different from the intervention group on observable and unobservable measures. If MHS had access to the data, a more appropriate comparison might be SSI clients elsewhere in Wisconsin who are similar (in observable characteristics) to MHS clients enrolled in case management. With this type of comparison group, MHS findings would be more defensible as program effects. In the current analysis, MHS cannot distinguish program effects from overall trends in health care utilization among Wisconsin SSI clients.

[19] Before April 2006, MHS used one of its nurses primarily in a triage role to review HRAs and make recommendations for case management placement. However, once MHS began using the PRR to make case management decisions, it moved this nurse back to case management activities.

CONCLUSIONS

This project addressed a policy question important to many Medicaid policymakers: Can we identify clients in need of case management services more efficiently than through resource-intensive health risk assessments? Before this project, MHS's experience with identifying members in need of case management was similar to many other Medicaid agencies and health plans. Specifically, collecting information with telephone-based health risk assessments was time-consuming and could result in the delay of case management placement for patients in need. MHS believes that the data included in the PRR (coupled with easy-to-collect data on recent hospital admissions) offer an opportunity to identify members in need more quickly and efficiently before collecting HRA data.

Analysis suggested that HRA scores and the PRR CDPS score both had a small association with the likelihood of case management placement. Moreover, the association of case management placement to patient outcomes was also small, but statistically significant, for SSI clients enrolled in MHS. However, from the analyses conducted, it is not possible to infer whether the PRR adds as much information as the HRA to the case management placement decision. The analyses did not account for the specific manner in which HRA, PRR, and other (such as social supports) data were used to make placement decisions. In general, there are multiple factors that determine case management placement and analyses suggest that neither HRA nor PRR scores are critical factors, but MHS believes that both tools can be used to help form the decision. Because PRR data could be calculated by any Medicaid health plan or agency using Medicaid claims data, a study with a more focused design could be conducted elsewhere. In particular, an analysis of the association of risk scores to case management placement should, at the minimum, (1) consider the process in which case management decisions are made, (2) align the collection of self-reported assessment data with claims-based data, and (3) conduct key sensitivity analyses to confirm primary findings.

MCKESSON'S DIABETES GROUP EDUCATION INTERVENTION

McKesson Health Solutions, a unit of McKesson Corporation, is a for-profit care management services firm whose mission is to improve the efficiency and effectiveness of health care through disease management and other services. Its Medicaid Value Program (MVP) intervention consisted of group educational sessions designed to strengthen diabetes management (through lifestyle changes and improvement in self-care skills) for nondual Medicaid beneficiaries who are aged, blind, and/or disabled (ABD) and enrolled in McKesson's disease management program in selected states. Patients with diabetes or congestive heart failure (CHF) and a diabetes comorbidity were eligible for the intervention.

The intervention added diabetes education in a discussion group setting to McKesson's standard disease management program that provides telephonic and face-to-face nurse services to patients. Certified diabetes educators trained in motivational interviewing techniques (a method for enhancing motivation for change by exploring and resolving patient ambivalence to change) led the sessions along with community-based registered nurses. The intervention is designed to improve patients' self-efficacy, knowledge of their disease, confidence to manage their disease, and self-care skills. Research on group educational sessions designed to motivate patients to manage their conditions suggests that motivational education helps patients augment regular medical treatment and may improve their health.

During MVP, one educational module consisted of four weekly 1.5-hour sessions. McKesson's goal was to have 300 patients complete a module across all study states with a target of 24 patients per each four-session module. This strategy would have required at least 13 modules to be implemented across study states, assuming every patient attended all four sessions. However, McKesson fell short of that goal with only 28 patients in total completing modules in Oregon and New Hampshire; there were four modules, two in each state. After determining whether patients were interested in the intervention, McKesson randomly assigned interested patients to the educational sessions and standard disease management (treatment) or to only standard disease management (control). Despite this rigorous program design, the small number of participating patients makes it difficult to evaluate this intervention's outcome measures in the short MVP time frame.

ORGANIZATIONAL CONTEXT

McKesson Corporation's primary businesses are pharmaceutical distribution and hospital information technology software development. McKesson currently contracts to provide disease management services to nine state Medicaid agencies and was a Medicare Health Support program contractor in Mississippi, where it provided services to Medicare beneficiaries with heart disease or diabetes. The MVP intervention's group educational sessions are an enhancement to McKesson's disease management model. Typically, clients who participate in the McKesson disease management program receive services by telephone from nurses in a care center or work-at-home environment and/or face to face from nurses in the field.

McKesson first became interested in facilitated learning models of patient care when it learned that research on physician-led group visits by University of Colorado researchers demonstrated that patient outcomes (such as clinical quality measures, utilization, and satisfaction) could improve after such visits. McKesson staff noted that its primary motivations for pursuing the intervention were to test an innovative model of care, to assist beneficiaries in becoming better skilled at managing their chronic health conditions, and to improve patients' overall health status. Staff also noted that one benefit of the intervention is that McKesson may be viewed as an organization willing to conduct innovative research. While the return on investment is important to McKesson, staff noted that it does not expect to evaluate the intervention's business benefits for more than a year after MVP, due primarily to its commitment to developing the educational sessions and attracting enough participants to gauge the potential impact of the intervention. Furthermore, McKesson views its MVP experience as an investment for further research into group educational sessions in other states.

McKesson has an incentive to identify effective methods of changing patient behavior; in particular, its disease management contracts can include financial risk if it does not meet cost-saving and clinical quality goals, such as the proportion of patients with HbA1c tests or the proportion of patients taking appropriate medications. In Oregon and New Hampshire, McKesson's contracts are based on fixed fees per member per month for which McKesson has a percentage of fees at risk if it does not meet pre-specified financial and/or clinical goals at fixed contract intervals. Staff noted that if McKesson could demonstrate that the group educational sessions provided a benefit above its existing program in terms of reducing emergency department use and hospital admissions, it could enhance the effectiveness of its disease management programs.

For MVP, McKesson partnered with staff from the School of Nursing at the Oregon Health Sciences University (OHSU). McKesson launched the intervention in Oregon, in part, because it recognized that OHSU staff were experienced in designing and implementing group educational health interventions. OHSU staff saw the project as an opportunity to examine the impact of interventions on chronically ill Medicaid clients, an understudied population. One OHSU staff member moderated the Oregon sessions with the help of co-facilitators and another trained McKesson staff for the sessions in New Hampshire.[1]

McKesson also formed an advisory board that brought together Medicaid officials and academic researchers from Oregon and New Hampshire, a representative from the American Diabetes Association, and McKesson team members. The board provided input on areas of patient behavior to be emphasized during the intervention's design phase. The board met once before the interventions commenced in Oregon and New Hampshire to devise a plan for each state, biweekly during the intervention in each state, and once after implementation in each state to review lessons learned and discuss next steps.

[1] Near the end of MVP, McKesson launched a similar intervention for Medicare patients with diabetes in Mississippi.

PROGRAM INTERVENTION

The intervention, a series of four weekly group educational sessions for patients with diabetes or CHF with a diabetes comorbidity, was designed to help patients build confidence needed to make lifestyle changes and improve their self-care skills. McKesson targeted ABD Medicaid clients who were active participants in its disease management program in states selected for the intervention. Active participants were beneficiaries who received coaching and monitoring by telephone from McKesson nurses at least once per quarter. The group educational sessions were an enhancement to McKesson's standard disease management program in that the sessions provided patients with the opportunity to interact with their peers to discuss challenges in managing their conditions, to identify ways to improve their health, and to set goals for improving their health.

After McKesson identified eligible patients from its enrollment data, a nonclinical staff member called the individuals to elicit their interest in the group educational sessions (see Figure 1). McKesson then randomly assigned patients who expressed interest in the sessions into treatment and control groups and directed nurses to call treatment group patients to schedule them for the group sessions.[2] McKesson offered patients incentives to attend all sessions in a module. Patients received cash for attending each session, and those who attended all four sessions were entered into a lottery to win a cash prize. To encourage attendance, McKesson also offered food, child care, and transportation assistance; for example, McKesson offered cab rides to patients in New Hampshire and offered bus vouchers to other patients. McKesson staff made reminder calls to patients before each session, reiterating offers of transportation assistance and child care.[3] Staff, though, did not believe that the incentives were the primary motivating factor for attendees; rather, most patients exhibited a genuine interest in learning more about their condition and how to manage it.

McKesson conducted sessions in Oregon in April 2006 and in New Hampshire in August 2006 with the goal of having 300 patients complete a module of sessions by the end of the summer. As noted in Table 1, although more than 150 clients expressed initial interest, only 28 patients completed the sessions. In fact, the total number of patients McKesson identified as eligible in Oregon and New Hampshire (237) was smaller than the treatment group's target size.

Diabetes educators led patients through exercises in an educational handbook designed by OHSU staff specifically for the intervention. Each session lasted 1.5 hours and included activities focused on (1) the importance of seeing doctors for follow-up and following physician treatment plans; (2) weight management; (3) activity, fitness, and exercise; and (4) diabetes

[2] For its group educational sessions in Mississippi, McKesson chose a different recruitment tactic and enlisted the assistance of primary care providers and a diabetes management center associated with the University of Mississippi Medical Center. McKesson staff believe that this approach was integral to its recruitment success there. However, staff acknowledged that there might be inherent differences between Medicaid clients and Medicare beneficiaries recruited in Mississippi.

[3] McKesson staff also repeatedly tried to reach patients who committed to attending the first session but subsequently did not attend, but had no success in reaching them due either to disconnected phone numbers or unanswered phone calls.

TABLE 1

PATIENT COUNTS IN OREGON AND NEW HAMPSHIRE FOR GROUP EDUCATIONAL SESSIONS

Number of Patients	Oregon	New Hampshire	Total
Identified as eligible (and called to elicit interest) for the sessions	127	110	237
Identified as interested in participating in sessions[a]	99	54	153
Randomly assigned to treatment group	52	31	83
Attended at least one session	17	11	28
Attended all four sessions	17	11	28

Source: Reported by McKesson on October 11, 2006.

[a]McKesson randomly assigned these patients to treatment and control groups.

symptom recognition and knowing when to visit a doctor. In addition, the sessions addressed what patients knew about managing their conditions, the aspects of management they were willing to improve, and goal setting. Staff reported that patients sometimes had difficulty with abstract concepts, such as gauging how important it is to change their behavior or how confident they were in their ability to make a change. Patients responded more favorably to concrete tasks, such as goal setting and making action plans. At the final session, patients created action plans for reaching their goals that McKesson shared with patients' primary disease management nurses for future followup.

Based on the recommendations of educators in Oregon, McKesson modified the workbooks in two small ways for the sessions in New Hampshire. First, some vocabulary was changed to make the wording easier to understand for a less-educated audience. Second, the session where participants were asked to weigh the benefits and barriers of changing behavior was simplified. These small changes were implemented because educators felt that participants' education level was lower than originally anticipated.

Owing primarily to the location of the intervention states and the availability of staff within the organization, McKesson used different staff to conduct the group sessions in Oregon and New Hampshire. However, in both states, McKesson employed two facilitators for every session. Staff reported that the staffing level was crucial to keep sessions on track, allow time to answer patients' questions, and to ensure that patients understood instructions. In Oregon (where the first sessions were held), the lead facilitator was a registered dietitian from OHSU with more than five years of experience in facilitating group educational sessions. McKesson used a different co-facilitator to assist the lead facilitator at each Oregon site (Portland and Medford) because it was unsure of participants' mental and physical health characteristics.[4] The co-facilitators in Oregon included a mental health nurse and a nurse with diabetes expertise.

[4] McKesson was uncertain as to whether or not participants would benefit more from having a co-facilitator with expertise in mental health or one with diabetes expertise. After the sessions in Oregon, staff noted that the co-

The two facilitators in New Hampshire (Dover and Manchester) were a registered nurse and a certified diabetes educator, both of whom had some mental health training. McKesson chose facilitators with mental health backgrounds for New Hampshire based on the experience it gained in Oregon, anticipating that clients in New Hampshire would have behavioral comorbidities. An OHSU staff member trained the New Hampshire facilitators in group discussion techniques before the sessions.

PROCESS AND OUTCOME MEASURES

McKesson reported both process and outcome measures as part of its MVP project. To provide an indication of the intervention's intensity, process measures included the number of patients attending sessions and the average number of sessions per patient. McKesson also reported both self-reported and claims-based outcome measures for the treatment and control groups. It conducted a chronic disease patient self-efficacy survey (at baseline and 90 days after the first sessions) and collected claims data on prescription drug use, HbA1c tests performed, inpatient admissions (all and cardiac-related), emergency department visits, and total medical costs (at baseline and one-year followup).

The measures are consistent with the goals of improving patients' confidence and self-care skills, particularly measures of patient self-efficacy, HbA1c tests performed, and prescription drug use. For the intervention to be successful (in the future) in both promoting change and educating patients on how to manage their diabetes, treatment group members, as compared with the control group, should demonstrate greater self-efficacy, be more likely to use insulin and oral anti-diabetic medications, and be more likely to have HbA1c tests performed (see Figure 1). Over the longer term, these changes in patients' behavior and attitudes toward their disease may improve their self-care skills, and ultimately may result in fewer emergency room visits and inpatient admissions related to diabetes and comorbid cardiac conditions, as well as lower medical costs and improved quality of life.

Though McKesson reported six months of follow-up data for the Oregon cohort and three months for the New Hampshire group, the small sample sizes make it difficult to infer that the intervention had an effect on outcomes. Moreover, it is likely not appropriate to judge this intervention on these claims-based measures over such a short follow-up period. However, self-reported patient self-efficacy measures provide a snapshot of the intervention's potential impact on self-efficacy, though no treatment-control differences are statistically significant (Table 2).

Among treatment and control clients (pooled across those randomly assigned in both states) who completed baseline and follow-up self-efficacy surveys (66 total patients), 44.7 percent of treatment group members reported higher self-efficacy scores compared with half of the control

(continued)
facilitator with mental health experience was a more valuable resource than the co-facilitator with only diabetes training, as many of the participants had behavioral health conditions.

TABLE 2

SELF-REPORTED PATIENT SELF-EFFICACY MEASURES
AMONG TREATMENT AND CONTROL GROUP MEASURES

	Treatment	Control	Percent Difference
Percent of Patients whose Self-efficacy Scores Improved	44.7	50.0	10.6
Average Self-efficacy Scores			
Baseline	6.0	5.4	11.0
Followup	6.4	5.6	14.4
Number of Patients	**38**	**28**	

Source: Reported by McKesson on January 11, 2007.

Notes: Includes all patients in Oregon and New Hampshire who were randomly assigned to treatment and control groups and who completed baseline and follow-up self-efficacy surveys. The number of treatment group patients is larger on this table compared with Table 1 because a number of patients randomly assigned to the treatment group never attended sessions.

group.[5] Average self-efficacy scores at followup were slightly larger for the treatment group (6.4) than the control group (5.6), but the difference (about 14 percent) was not statistically significant. The minimum treatment-control difference in self-efficacy scores we could potentially detect with sample sizes this small would be about 24 percent. To detect a difference as small as 14 percent, we would need a sample of 180 patients (split evenly between the treatment and control groups).[6]

Two short-term outcome measures—the proportion of patients with HbA1c tests and prescription drug claims—of sample members in Oregon also provide a glimpse at potential intervention benefits (Table 3). In the first five months after attending educational sessions, 67.6 percent of treatment group members had an HbA1c test conducted compared with 54.3 percent of control group members. Although this 24 percent difference was not statistically significant, it is noteworthy because in the year before the educational sessions there was essentially no difference in this measure between the treatment and control groups. A larger proportion of treatment group members also had fills for either insulin or oral hypoglycemic medications compared with control group members (76.5 percent versus 65.2 percent), though this difference was also not statistically significant. In general, these short-term outcome data are suggestive of a potential beneficial effect of the intervention, but without a longer follow-up

[5] The treatment group includes five members who reported the same score at baseline and followup, all of whom reported 8.0 or larger (with three reporting 10, the maximum). Excluding these persons from the treatment group sample would result in a slightly larger proportion of treatment group patients reporting higher followup scores (51.5 percent versus 50 percent), but this difference is not statistically significant.

[6] Estimated using sample variances for the treatment and control groups at 80 percent power and the 95 percent confidence level.

TABLE 3

SHORT-TERM OUTCOME MEASURES AMONG TREATMENT AND CONTROL GROUP MEMBERS IN OREGON IN THE FIVE MONTHS AFTER THE INTERVENTION

	Treatment	Control	Difference
Proportion with HbA1c Test			
Baseline	71.4	70.2	1.2
Followup	67.6	54.3	13.3
Proportion with Claims for Insulin or Oral Hypoglycemic Drug			
Baseline	88.6	76.6	12.0
Followup	76.5	65.2	11.3
Number of Patients	**34**	**46**	

Source: Reported by McKesson on May 23, 2007.

Note: Number of patients reported here is total number at followup; one patient from each group was lost from baseline to followup.

period and larger sample size we cannot conclude that the intervention has a statistically significant effect on these outcomes.

INTERVENTION CHALLENGES

Challenges included a smaller-than-expected number of eligible patients and management of patients' needs during group sessions. McKesson also noted that developing patient incentives and finding locations to hold sessions were resource-intensive tasks. In addition, feedback from the advisory board was slower than expected at times.

Small patient counts were a considerable challenge for McKesson to overcome. In Oregon and New Hampshire, McKesson identified only 237 patients eligible to participate in the group educational sessions.[7] While about 65 percent of these patients demonstrated an interest in participation, only 28 patients (about one-third of the treatment group) completed the modules in both Oregon and New Hampshire, well short of McKesson's goal of 300 patients. Patient skepticism was a key factor in one-third of eligible members not wanting to participate. McKesson noted that many clients were skeptical of the offer of free services and believed the intervention to be "too good to be true," which is a typical response among Medicaid clients. On a positive note, all patients who began the sessions completed all four modules, suggesting McKesson was successful at retaining patients after the initial group meeting. In fact, patients

[7] In its proposal, McKesson had noted that 8,193 Medicaid clients in Oregon and 1,020 in New Hampshire were eligible for its diabetes disease management program. However, it did not choose target geographic areas until after being awarded the MVP grant.

who attended sessions were extremely satisfied with them and wanted them to continue beyond the intervention period.

McKesson reported that the barriers to client participation included inability to reach patients by phone, scheduling conflicts, individual crises, and physical ailments that prevented patients from leaving their homes. In the time between eliciting interest in the educational sessions and scheduling clients for the sessions, about 30 percent of clients' phone numbers had been disconnected. Among those members McKesson could reach by phone, staff reported that the available times for sessions in Oregon and New Hampshire were inconvenient for some patients. Staff also noted that patients seemed to be "in crisis" and unable to attend sessions (due to these crises or, sometimes, a physical ailment) even after they had agreed to do so.

As might be expected from an ABD Medicaid population, participants' functional and social skills varied widely, influencing facilitators' activities during educational sessions. For example, at one site, two clients could not write, and another was blind; as a result, facilitators had to spend disproportionate amounts of time with these patients. In general, staff believed that if the group sessions had included 24 people each as originally planned (versus the 7 per session, on average) and only two facilitators, the sessions would have been even less productive because of patients' wide range of functionality. In addition, some clients lacked basic social skills, such as waiting for others to finish a comment before offering their own. Staff also noted that some patients brought guests who were sometimes disruptive. Staff reported that participants and their guests tended to speak to one another during sessions, sometimes interrupting the group discussion. Since most participants reported (to McKesson) that the sessions were a positive experience, it appears that these issues were manageable for facilitators at the scale of these pilot sessions.

CONCLUSIONS

The intervention provided important qualitative findings in view of growing interest in the use of group visits among Medicaid agencies, health plans, and other health care organizations. In particular, McKesson's experiences with patient recruitment and participation, as well as the dynamics of group educational sessions for Medicaid beneficiaries, can help inform others of potential pitfalls. Moreover, to guide the design of an intervention for Medicaid patients, it is useful to know the aspects of the sessions to which patients most favorably responded.

Whether or not it is feasible for McKesson, or another organization, to implement this intervention (or one similar to it) in the future will depend on a number of factors. First, implementation is very resource intensive in terms of program development and the ongoing costs of recruitment. Program development includes the design of the workbook, training educators who facilitate sessions, and locating venues to hold meetings, while recruiting costs can include time spent trying to locate patients and money spent on incentives to entice clients to participate. Second, because the intervention is so resource intensive, implementation requires a strong commitment by its sponsor (as was evident with McKesson). Third, the sponsor must identify the optimal participant-to-facilitator ratio that will balance staff burden and the staff's ability to effectively facilitate sessions with the need to engage a large enough group of participants to infer intervention effectiveness on patient outcomes.

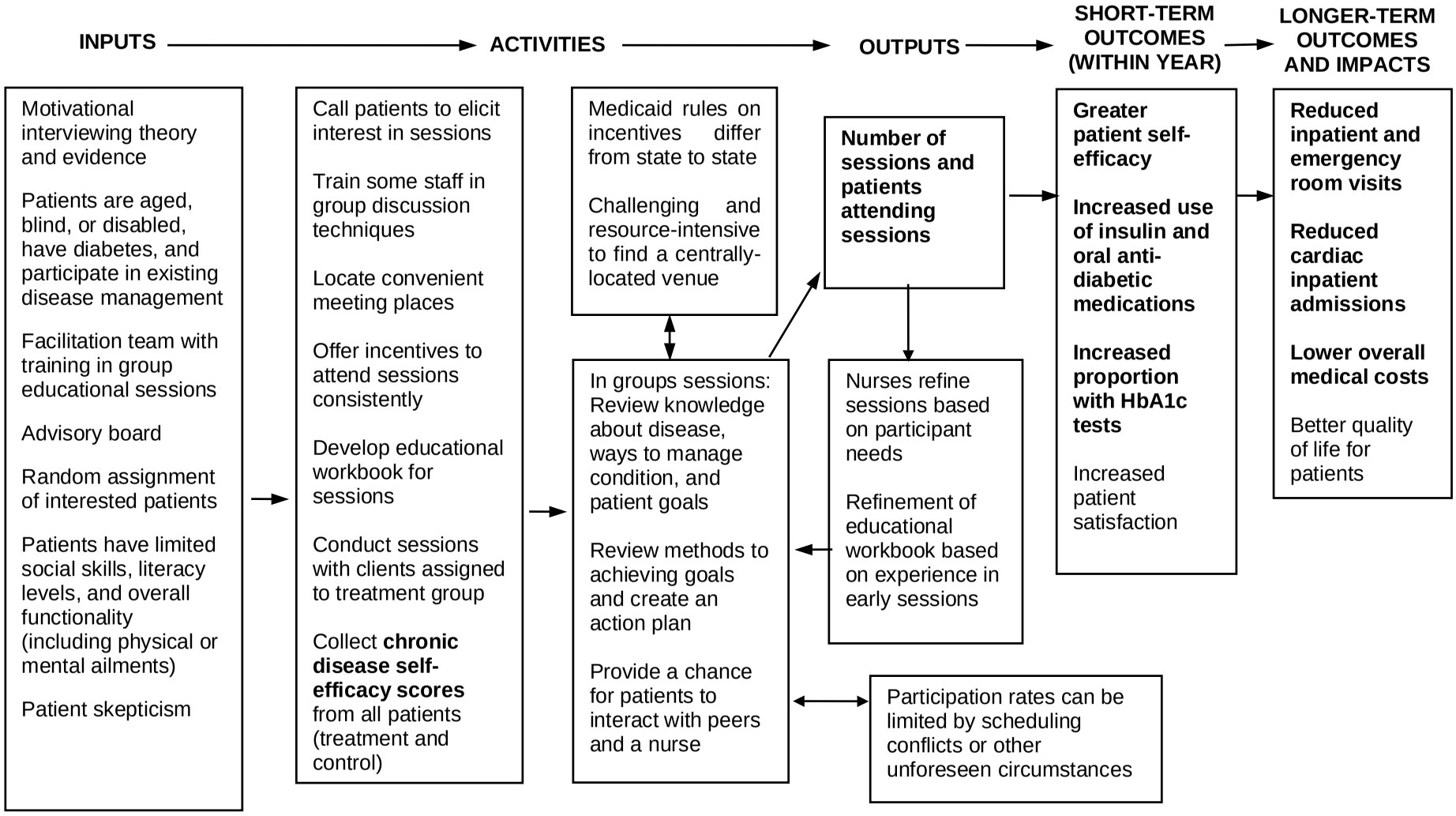
In many ways, these factors are dependent on each other. For example, while a large group is needed to have sufficient power to detect impacts, it also takes long-term commitment of the sponsor to implement a greater number of sessions with fewer patients rather than a few sessions with many patients. Moreover, more facilitators must be trained to lead additional group educational sessions. OHSU staff noted that well-trained educators were a critical aspect to intervention replicability in different settings. Staff reported that educators should have good group facilitation skills, a background in diabetes management, training in mental health issues, and an orientation in motivational interviewing. One potential strategy includes McKesson's plan to use its own community-based registered nurses and local diabetes educators as co-facilitators, training these nurses in motivational interviewing before sessions begin, and limiting sessions to 15 participants.

An important lesson learned in this intervention is that a sponsor will likely face a number of barriers in convincing ABD Medicaid clients to participate in a group educational intervention, including skepticism, disinterest, client mobility (from one residence to another), and individual day-to-day crises. Strategies to improve participation that McKesson did not utilize, but plans to in the future, include sending informational mailings to patients; asking about ailments, disabilities, or other reasons a person might not attend a session; and inquiring about patients' availability before scheduling sessions. In addition, McKesson also plans to conduct provider outreach before recruiting patients into the intervention in the hopes that primary care providers will encourage patients to participate.

It is difficult to assess whether this MVP intervention was successful at improving targeted outcomes (but anecdotally patients were pleased with the educational sessions). On the one hand, from an implementation standpoint, McKesson and OHSU collaborated successfully to create an easy-to-understand educational workbook (which it has already refined based on its experience), making the intervention generalizable to other Medicaid clients with diabetes and, potentially, other chronic illnesses. Moreover, McKesson staff reported that intervention participants appreciated the sessions considerably and were motivated enough to develop care plans and attend all sessions in each module, allowing McKesson to achieve its goal of having all patients who began a module finish that module. On the other hand, treatment-control differences in patient outcomes were not statistically significant. However, given the response of intervention participants, as well as McKesson's commitment to fielding more modules and training facilitators to lead sessions, the intervention does have the potential to be successful at affecting patient behavior and ultimately, with a large enough sample size, have a statistically significant impact on patient outcomes. In particular, high patient motivation suggests that short-term outcomes such as self-efficacy and quality measures (like use of the proper medications and having tests performed regularly) that have a direct association to longer-term outcomes (like inpatient admissions and emergency room visits) might be improved. The trends in reported outcomes data suggest that this MVP intervention's potential as an add-on to existing disease management services is promising.

FIGURE 1

LOGIC MODEL FOR MCKESSON'S DIABETES GROUP EDUCATION INTERVENTION



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

MEMORIAL HEALTHCARE SYSTEM'S HEALTH NAVIGATOR INTERVENTION

Memorial Healthcare System (Memorial) is a public non-profit healthcare provider that serves as the "safety net" facility for southern Broward County, Florida. Governed by a seven-member Board of Commissioners appointed by the governor of Florida, Memorial consists of six hospitals, numerous ancillary facilities including a nursing home, an urgent care center, a network of primary care centers, two mobile health centers, and a Center for Behavioral Health. Memorial provides health care to more than 98 percent of Medicaid beneficiaries in southern Broward County (either through its own Medicaid products or by delivering care via contract with other organizations).[1] For the Medicaid Value Program (MVP), Memorial targeted adult Medicaid beneficiaries with two or more chronic health conditions who already participate in Memorial's existing disease management program; at least one of those chronic conditions must be diabetes, asthma, congestive heart failure (CHF), hypertension or HIV/AIDS.

Memorial's MVP intervention utilized a "health navigator," a licensed social worker with a background in behavioral health. The health navigator focused on the unique psychosocial needs of patients, including food assistance, rent assistance, and referrals to behavioral health services. Whereas disease management nurses focus on the patients' medical needs, the health navigator aimed to link patients with support services that improve their social functioning. This may ultimately help patients focus more on managing their disease(s), reduce unnecessary utilization (such as avoidable hospital admissions), improve health status, and improve quality of life. To examine the impact of the intervention on these outcomes, Memorial randomly assigned disease management patients to treatment and control groups.

Although other similar models exist, there is little evidence of the impact of a health navigator-type intervention. Memorial staff reported that the need for such a navigator position was clear; for example, disease management nurses had been consistently asking for a social worker to help their patients navigate the system and work with patients on psychosocial needs.

ORGANIZATIONAL CONTEXT

Memorial provides health care services to all persons, regardless of their ability to pay, and has a long history of working with Medicaid and uninsured patients.[2] Given the complex needs of the patients it serves, Memorial has focused on disease management and preventive care for several years, which staff reported as unusual for a safety net institution. (Specifically, Memorial's disease management program began in 2000.) Memorial staff also noted the importance of overlaying social support services (through an intervention like the health navigator) on existing disease management, given the complex needs of many of its patients; and

[1] In addition to the Medicaid beneficiaries it serves, Memorial also serves as the health care delivery setting for the majority of privately insured patients in the community.

[2] Health care provided by Memorial to indigent patients is financed through a special taxing district created by the state legislature in 1947.

several Memorial staff members noted that the navigator intervention has strong organizational commitment from the top down.

While organizational commitment to the intervention appears stable, the structure and financing of Memorial's Medicaid care delivery is currently in flux, given recent state Medicaid reform. (While reform in Broward County was scheduled to begin in July 2006, it ultimately began several months later in fall 2006.) Prior to this reform, Memorial provided disease management to Medicaid beneficiaries through one of two programs: (1) The FAHS (Florida: A Healthy State) program, which was a disease management program provided to Florida's MediPass enrollees[3], or (2) disease management to enrollees in MHS' provider service network (PSN), which is essentially a health management organization (HMO) look-alike financed primarily through fee-for-service payment but with a shared savings component. Under Medicaid reform, however, almost all Medicaid beneficiaries in the two counties under the reform pilot are now required to receive care through either an HMO or a PSN, with the MediPass program and fee-for-service Medicaid essentially being eliminated in those two counties.[4] This has meant a major change for Memorial's Medicaid patients, given that the majority was enrolled via MediPass, rather than PSN. Fewer MediPass members than Memorial staff expected were transitioned to the PSN program; these patients instead enrolled in HMOs offered in the county (but typically still receive inpatient and ambulatory care at Memorial-affiliated settings).

Florida's reforms are intended to promote greater statewide management of Medicaid beneficiaries by plans and care delivery organizations. Moreover, given those reform efforts, it is possible that the state may move to convert Medicaid PSN programs (whose payment is still largely fee-for-service) to a risk arrangement (or capitated payment) within a few years. In that case, Memorial's (and others') incentives to control costs will be even larger.

Pfizer has played an important role historically in Memorial's disease management program. In 2002, Pfizer Health Solutions (PHS), a subsidiary of the Pfizer pharmaceutical company, formed a partnership with Florida's Agency for Healthcare Administration to improve the health of chronically ill Medicaid patients while reducing healthcare costs for the state. PHS provided a guarantee of $33 million in savings to the state of Florida.[5] As part of its involvement, Pfizer helped fund various components of disease management; in fact, Pfizer partnered directly with Memorial on this work and, until recently, financed a nurse care manager in Memorial's FAHS disease management program.[6] While Pfizer is no longer directly involved with the program, it was an important partner to Memorial in the past.

The state Medicaid office (the Florida Agency for Health Care Administration or AHCA) reportedly supported Memorial's health navigator intervention, though its involvement in the

[3] MediPass is a primary care case management program with fee-for-service payment from the state.

[4] A very small number of beneficiaries will be able to retain fee-for-service Medicaid.

[5] In exchange for these promised savings, the state agreed to include all of Pfizer's drugs on the state's preferred drug list.

[6] In late 2005, the state legislature decided that Pfizer's participation in the MediPass program was not legal. The state agreed to continue financing the program through state funds, however, given the savings that had accrued.

intervention remained fairly minimal throughout MVP (with AHCA staff focused on state Medicaid reform at this point). AHCA staff, however, did work with Memorial to help identify the clinical codes used for certain chronic conditions in order for Memorial to draw the intervention's target population from existing Medicaid data.[7]

Not surprisingly, Memorial also was focused on the state's major Medicaid reform efforts. The majority of its Medicaid members were enrolled through MediPass prior to state reform, and the system lost a large number of Medicaid members as a result. In light of these contextual factors, the health navigator intervention was not considered a top priority (given the resources and energy that Memorial had to devote to reform). Nonetheless, Memorial staff, including senior executives, were optimistic that the health navigator would result in important improvements in patient care, and the organization appeared committed to this work in the short term, until outcomes could be more fully assessed over a longer time frame.

PROGRAM INTERVENTION

Memorial's health navigator intervention targeted patients who were already participating in the disease management program and had at least two chronic conditions (including at least one of the following: diabetes, asthma, congestive health failure, hypertension, or HIV/AIDS).[8] The health navigator, who is bilingual, served as the primary staff person on the MVP intervention. While all patients receiving the health navigator treatment were already receiving disease management services, they may have had other needs and issues that prevented them from managing their disease. In the words of one Memorial staff member, "it's very hard to get people to monitor their blood sugar… when they don't have money for food or their electricity is going to be turned off tomorrow." The health navigator, therefore, focused on patients' psychosocial needs, so they could better focus on medical issues.

Patients were identified as eligible for the intervention through either claims data (with chronic conditions identified through *International Classification of Diseases, Ninth Revision*, or ICD-9, codes) or physician referral. Patients who met the eligibility criteria were then randomized into treatment and control groups; the treatment group received the health navigator services in addition to (existing) disease management services, and the control group received disease management services only. (Existing disease management activities were conducted primarily by telephone; in-person visits were fairly rare.) The bulk of enrollment into the intervention occurred when it first began in January 2006. At that time, approximately 110 patients were assigned to the treatment group and 50 to the control group. While new disease management patients were continuously enrolled in the intervention, only a few new Medicaid members joined the disease management program each month because Memorial's PSN caseload grew very slowly.

[7] Memorial only needed assistance from the state in identifying MediPass patients; it already had its own data on PSN patients.

[8] The following types of patients were excluded from the intervention: dual eligibles, those who were pregnant, those who were institutionalized, and those who had active cancer or end-stage renal disease.

After being randomly assigned to the treatment group, the patient was told by a nurse manager who handled the patient's disease management function that a social worker (the health navigator) would contact him/her. The navigator then contacted the patient over the telephone and, if possible, scheduled a home visit. (See Figure 1 for information on the flow of intervention activities.) During the home visit, which typically lasted one and one-half to two hours, the health navigator assessed the patient through a standardized patient assessment protocol that collects information on medical, social, financial, environmental, mental, and substance abuse issues.[9] The navigator then developed a care plan, which the patient signed. Depending on the patient's needs, the navigator would then connect the patient to a local food bank and social service agencies to help pay rent, provide transportation, or apply for food stamps. The navigator would also provide a mental health referral, if necessary. She may also have offered the patient education materials on nutrition and so forth. After arranging for social and mental health services, as needed, the health navigator followed up periodically, typically calling the patient twice a month.

An important aspect of the intervention was the close connection between the health navigator and the disease management nurses. The health navigator actually worked in the same physical space as the disease management nurses. They talked regularly—both through regular formal meetings and informal conversations—about their common patients. In fact, when the intervention first began and 110 patients were assigned to the treatment group, the navigator used information provided by the disease management nurses to understand which treatment group patients were most in need to help prioritize her contacting patients. The health navigator and disease management nurses also shared information through the disease management database where they all recorded notes after every patient contact or visit. According to one Memorial staff member, the disease management nurses have said, "we were a three-legged horse running a race [until the health navigator]. She is the fourth leg."

Given that the health navigator works so closely with the disease management nurses, the distinction between and delineation of roles may become less clear over time. In fact, one staff person noted that the navigator began to take on more of a clinical role over time that historically was performed by the nurses. To ensure that the navigator brings added value to the disease management program, it is probably important that the roles remain at least somewhat distinct and complementary.

PROCESS AND OUTCOME MEASURES

Memorial reported a number of process and outcome measures related to its intervention. Process measures reported for patients in the treatment group included the following, all of which are based on the disease management database and/or chart audit (see Figure 1):

- Proportion of treatment group patients who received a health navigator home visit

[9] This patient assessment was based in part on one used by Memorial's disease management nurses, but added several components related to psychosocial needs.

- Proportion of treatment group patients who received a health navigator home visit and had a completed psychosocial intake and depression screening
- Proportion of treatment group patients who had an individualized care plan and, if needed, referrals
- Of those given referrals, proportion of treatment group patients who complied with referrals

In addition, Memorial reported one additional process measure, which reflects the intensity of the intervention for both the treatment and control groups: the average number of telephone or in-person contacts per patient by the health navigator and disease manager combined.

The health navigator conducted home visits for approximately 70 to 80 percent of those patients in the intervention group from October 2006 to April 2007 (Table 1). (Other treatment group members were contacted but either refused directly, did not respond to scheduling requests, or could not be contacted.) Among patients receiving a home visit, the navigator always was able to complete a psychosocial intake, suggesting a strong rapport between navigator and patient and a willingness on the part of patients to provide information. By April 2007, nearly 80 percent of those with a home visit received an individualized care plan, which included items like referrals to social service agencies, completion of an application for

TABLE 1

TREATMENT GROUP PROCESS MEASURES FOR MEMORIAL'S HEALTH NAVIGATOR INTERVENTION, FIRST FIVE QUARTERS OF PROGRAM OPERATIONS
(Percentages, Unless Otherwise Noted)

	April 2006	July 2006	October 2006	January 2007	April 2007
Had a health navigator visit	42.2	63.9	73.0	77.9	76.6
Sample Size	**116**	**97**	**74**	**77**	**64**
Completed intake screen (among clients with a visit)	100.0	100.0	100.0	100.0	100.0
Sample Size	**49**	**62**	**54**	**60**	**49**
Had individualized care plan (among clients with a screen)	32.7	51.6	66.7	63.3	79.6
Sample Size	**49**	**62**	**54**	**60**	**49**
Complied with referrals (among clients with a care plan)	81.3	65.6	77.8	79.0	94.9
Sample Size	**16**	**32**	**36**	**38**	**39**

Source: Reported by Memorial on May 9, 2007.

adult day care, and referrals to a mental health provider. (The navigator then followed up with the patient at least once a month to determine if various items of the care plan have occurred.) The remaining one-fifth of patients did not have needs that required a plan or already had made the appropriate contacts with social service agencies or others. No fewer than 65 percent of clients with care plans complied with referrals in any three-month period and 95 percent had done so in the quarter ending April 2007.

In only a short period of time, the health navigator intervention was successful at increasing the number of patient contacts with Memorial staff (Table 2). On average, treatment group members had nearly twice as many contacts per quarter with either the health navigator or their disease manager compared with the control group (4.5 contacts per treatment group member versus 2.4 per control group member), suggesting that the intervention's intensity was high (especially when one accounts for the intervention's scope as evidenced by other process measures). With the health navigator intervention in place, treatment group members averaged 1.5 contacts per month while control group members averaged less than one contact per month. Since 20 percent of treatment group members never had a health navigator visit, these data suggest that mean contacts among those who took advantage of the intervention was even larger.

TABLE 2

AVERAGE NUMBER OF DISEASE MANAGER AND HEALTH NAVIGATOR CONTACTS AMONG TREATMENT AND CONTROL GROUP MEMBERS PER QUARTER

	Treatment		Control		
	Sample Size	Average Number of Contacts	Sample Size	Average Number of Contacts	Percent Difference in Contacts
Baseline	104	1.1	36	1.1	–0.4
April 2006	116	5.8	42	3.6	60.4
July 2006	97	3.2	37	1.0	216.5
October 2006	74	3.6	29	2.2	63.5
January 2007	77	2.8	28	1.5	87.9
April 2007	64	7.2	28	3.7	95.8
Average per quarter during the intervention	86	4.5	33	2.4	85.4

Source: Reported by Memorial on May 9, 2007.

Note: The baseline period was November 2005 to January 2006.

Memorial also collected three outcome measures for both treatment and control group patients: (1) the proportion of patients who rated their satisfaction with Memorial's disease management program as either excellent or very good, based on a short satisfaction survey administered by telephone, (2) the average self-reported mental health status scores, using the SF-12 instrument, and (3) the proportion of patients with avoidable hospital admissions, based

on claims data.[10] All three of these outcome measures were reported at baseline, as well as 6 and 12 months after the intervention began.[11]

Treatment-control differences over the first 12 months of the intervention for these outcome measures were mixed. We might expect the intervention to first have had an effect on measures such as satisfaction and mental health scores, but the sample sizes at followup for these measures were small (44 and 79, respectively), making it impossible to determine if treatment-control differences are impacts or due to chance (Table 3). Nonetheless, it is noteworthy that a larger proportion of treatment group members than control group members rated Memorial's disease management program as "excellent" or "very good" in its biannual satisfaction survey (93 percent versus 86 percent). With such a small sample, the minimum detectable treatment-control difference we could detect in this measure would be about 25 percent.[12]

When measured after the first 12 months of the intervention, the treatment-control difference in average mental health status scores was small, and likely not significant (especially with such a small sample). Although the health navigator made mental health referrals for a number of patients during the intervention (and some complied), it likely takes more time for these services to result in differences in this type of measure.

The one outcome measure that might require the most time to change was the number of avoidable hospital admissions (measured per 100 patients enrolled). However, the treatment-control difference in this measure was the largest among all outcome measures. Treatment group members had more than 50 percent fewer admissions (per 100 patients) than control group members during the intervention. While this might be statistically significant, there was also a large difference in baseline values of this measure, but in the opposite direction. Due to this pre-intervention discrepancy, the small sample size, and short followup period (for this type of measure), there is not enough information to infer whether or not this difference is a true program impact or occurred by chance.

The measures collected by Memorial suggest that the health navigator was successful in implementing various components of the intervention, with strong performance on all process measures. The outcomes of the intervention, however, are much less clear and our ability to infer whether or not the intervention had effects on them is limited, at the least, by the small sample size and also by the short followup period (particularly for inpatient admissions).

[10] An avoidable hospitalization is defined as one in which the primary or secondary diagnosis for the hospitalization is a condition for which they are receiving disease management services.

[11] Memorial also reported the mental health status score measure at 15 months after the intervention began, but the sample size was small (54 total patients), so we do not report these data here.

[12] Estimated at 80 percent power and the 95 percent confidence level, using sample means to calculate sample variances for the treatment and control groups.

TABLE 3

OUTCOME MEASURES REPORTED BY MEMORIAL FOR THE TREATMENT AND CONTROL GROUPS AT BASELINE AND FOLLOWUP

	Treatment		Control		
	Sample Size	Value	Sample Size	Value	Percent Difference
Percent Rating Memorial Disease Management Program as Excellent or Very Good					
Baseline	35	85.7	12	83.3	2.9
Followup	30	93.3	14	85.7	8.9
Average SF-12 Mental Health Component Score					
Baseline	125	45.4	46	46.7	–2.6
Followup	59	43.4	20	44.9	–3.3
Number of Avoidable Inpatient Admissions (per 100 Patients)					
Baseline	104	18.3	36	13.9	31.5
Followup	77	14.3	28	32.1	–55.6

Source: Reported by Memorial on May 9, 2007.

Note: The baseline period for the number of avoidable admissions measure was calendar year 2005 and the followup period is calendar year 2006. Baseline measures for the satisfaction and mental health scores were collected at the beginning of the intervention and followup measures were collected 12 months after the start of the intervention.

INTERVENTION CHALLENGES

Memorial faced a few challenges implementing its intervention. First, the intervention started several months after originally anticipated because of staffing issues and delays related to a severe hurricane season in 2005. The health navigator intervention, however, was in place by January 2006 and, despite some initial communication problems between the health navigator and disease management staff, appeared to have run without incident.

Memorial also encountered some patient resistance or lack of cooperation. Twenty percent of patients (25 of 125) who were randomly assigned to treatment formally declined to participate. Of those who did agree to participate, the health navigator conducted home visits with about 75 percent as of April 2007. Similarly, some patients who were provided a referral to a mental health provider did not comply with that referral. As one senior executive at Memorial stated, “We can walk you to the trough, but we can’t make you drink.”

Unfortunately, because of the state Medicaid reform efforts discussed above, many of Memorial’s patients were disenrolled from MediPass/FAHS since the fall of 2006. As a result, the treatment group included about 60 patients and the control group about 30 patients as of April 2007. The smaller than expected number in the treatment group, however, allowed the health navigator to spend more time with each patient and perhaps provide a slightly more intensive intervention than originally anticipated.

CONCLUSIONS

Memorial conducted its health navigator intervention over one year, allowing a substantial amount of time to track process and short-term outcome measures. Its information technology department was supportive in both building the disease management database and reporting the process and outcome measures; as a result, Memorial was able to report measures for several quarters. Besides a slightly slower than expected start to the intervention, the primary challenge involved the small number of patients in the treatment and control groups. The dwindling numbers were due in large part to recent Medicaid reform at the state level, though some level of general churn in and out of Medicaid was also a factor. Despite the strong study design, the small samples greatly limited the ability to identify whether the intervention had an impact on treatment group outcomes compared with the control group.

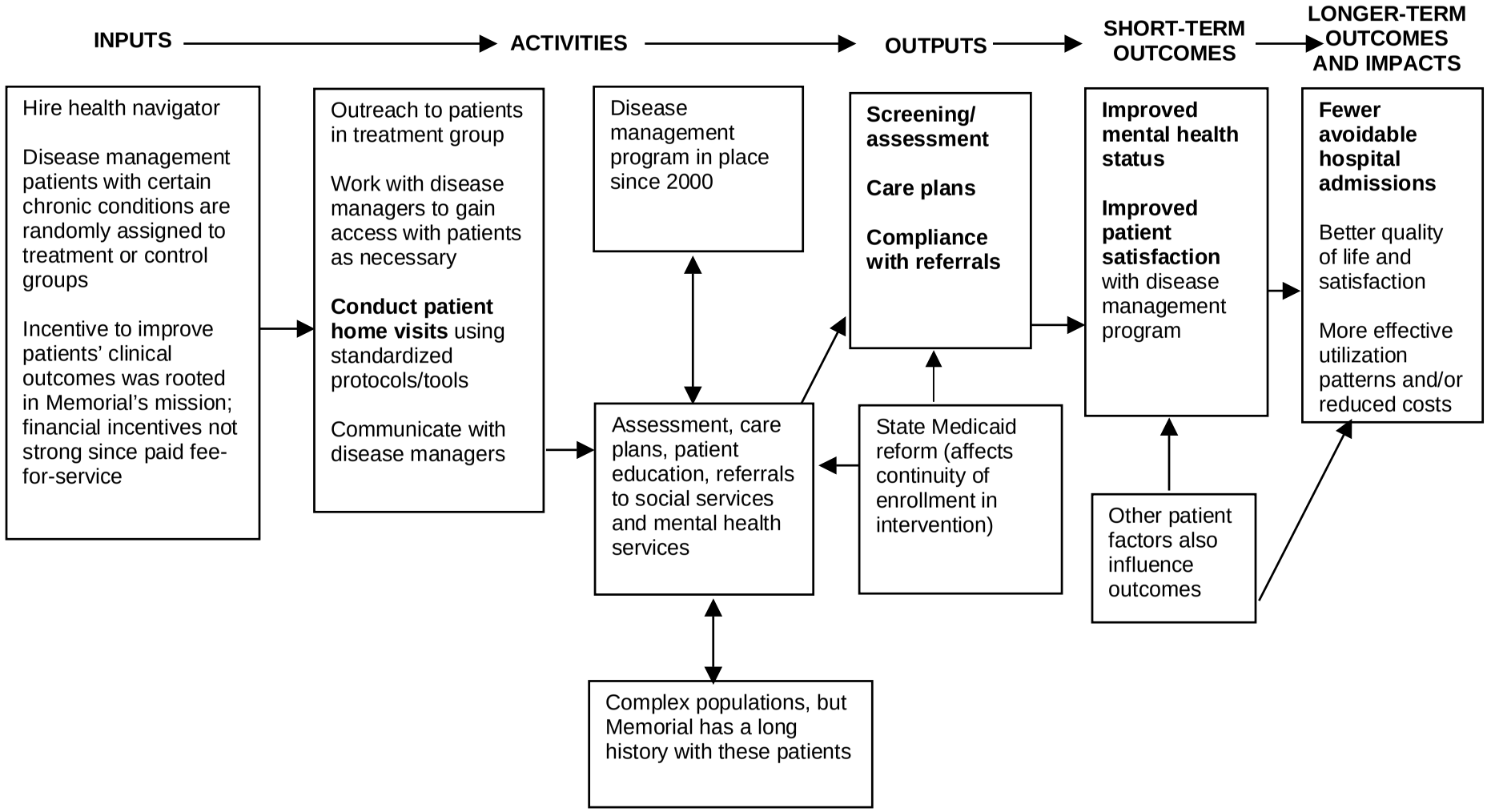
The health navigator intervention appears promising. While the intervention's effect on outcomes remains unclear, Memorial staff have a very favorable view of the health navigator. Disease management nurses and others feel that the navigator reduces burden on disease management nurses and is improving patient care. The treatment-control group difference in patient contacts seems to support this notion and is strong evidence for how well the intervention was implemented. Moreover, as several Memorial staff noted, the health navigator intervention—particularly the initial assessment and approach—was well-defined, standardized, and straightforward.

The components of the navigator intervention appear quite replicable in other settings, as long as there is a dedicated social worker with a mental health background, strong links to community resources, and tools for use during home visits (such as the PHQ-9 depression screening tool). However, if a program sponsor wants to reach more patients than this intervention, it will likely need to employ additional health navigators, as the services provided are resource intensive. In addition, in order to maximize the effectiveness of the health navigator, existing clinical staff must be willing to engage this staff member actively in the planning of patient care.

Given that staff support at Memorial is strong, sustainability appears likely in the shorter term–at least until longer-term outcomes can be more fully assessed. The prospects for longer-term sustainability, however, are much more uncertain. While it would help if the intervention showed more favorable results in terms of patient outcomes, no formal return on investment analysis is necessarily required to sustain such an intervention at Memorial. Yet even in the presence of favorable outcomes, other competing demands within the health system—financial or otherwise—could prevail and diminish the likelihood of sustainability.

FIGURE 1

LOGIC MODEL OF MEMORIAL'S HEALTH NAVIGATOR INTERVENTION



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

PARTNERSHIP HEALTH PLAN'S PHASE INTERVENTION

Partnership HealthPlan (Partnership) is a nonprofit Medicaid (Medi-Cal) health plan in Solano, Napa, and Yolo counties in northern California. Formed in 1994, Partnership has 88,000 members and is the only plan serving Medicaid beneficiaries in the three counties. For the Medicaid Value Program (MVP), Partnership implemented a provider-based intervention known as PHASE (Preventing Heart Attacks and Strokes Everyday), which, developed by Kaiser Permanente, aims to improve care for adult diabetic members with hypertension, cardiovascular disease, or depression. PHASE has three goals:

- Increasing medication use (specifically aspirin, lipid-lowering medications, ACE inhibitors, and beta blockers)
- Increasing laboratory testing, monitoring, and control (of blood pressure, lipids, and blood glucose)
- Promoting lifestyle changes (including tobacco cessation, physical activity, healthy eating, and weight management)

Seven primary care physicians spanning eight small practices participated in the intervention.[1] Although all participating physicians in PHASE received the same training and educational materials, Partnership encouraged each practice to identify approaches and process changes that were most appropriate to their specific practice to help ensure achievement of the intervention's goals. For example, some practices had existing registries to track their patients' laboratory test results or identify which patients were missing which laboratory tests. Other practices did not maintain registries or electronic systems, and therefore pursued the intervention's goals through other means, such as flow sheets, colored chart covers, and decision trees.

Given that the PHASE program was already developed by Kaiser Permanente, its underlying theory and evidence of impact existed when Partnership decided to pursue the intervention; Kaiser's own research had demonstrated that PHASE improved medication use and lowered costs. To assess the effectiveness of the intervention in selected practices with which it contracts, Partnership compared measures of care processes and outcomes for diabetic patients treated by participating physicians (about 225 patients) with the standard care received by diabetic patients in all other practices in Partnership's network, almost 90 practices serving approximately 1,650 diabetic patients.[2]

[1] Two participating physicians worked in two separate practices. All participating physicians were solo practitioners with one exception and included a mix of urban and rural settings in Partnership's three-county area. These practices included three safety-net providers.

[2] Dually eligible patients were excluded as medication data were unavailable since the implementation of Medicare Part D. Kaiser patients were also excluded because Kaiser's implementation of PHASE was somewhat different from Partnership's, as discussed later.

ORGANIZATIONAL CONTEXT

Partnership is the only plan serving Medicaid beneficiaries in the three northern California counties. While the vast majority of Partnership's members are Medicaid beneficiaries, the plan also serves a small number of members through *Healthy Kids*, a county insurance expansion program. Partnership contracts with approximately 240 physicians spanning almost 90 practice sites. About 12 sites are safety-net providers; Kaiser physicians account for 4 practice sites. Partnership's market area includes a mix of urban and rural areas.

Partnership's interest in this project was spurred to a considerable extent by the financial pressures it faces as a result of California's low Medicaid managed care capitation rates (see Holohan and Suzuki 2003).[3] In response to these cost pressures, Partnership investigated its patient population and identified its members with diabetes as contributing disproportionately to its costs. Partnership's enrollees with diabetes represented less than 8 percent of all members but accounted for at least 15 percent of health plan costs (at the inception of MVP). Therefore, an intervention aimed at improving the care for, and ultimately reducing the costs of, diabetes patients was a logical focus for the health plan's intervention. Partnership decided to pursue a provider-focused intervention after its leadership determined within the past few years that change can be most effectively pursued at the provider level rather than at the member level. Since then, Partnership has focused most of the plan's quality improvement efforts on provider-level interventions.

Partnership operates as a network model health plan, contracting with independent physician practices and clinics across the three-county area it serves. To initiate PHASE, Partnership met in summer and fall 2005 with physicians and practices with which it had strong existing relationships to discuss the intervention. Partnership then moved forward with several practices that, after an initial meeting, appeared ready to make changes (therefore, the practices represent a group that is not necessarily representative of practices with which Partnership contracts).[4] The practices participating in PHASE are a mix of urban and rural providers, and fewer than half are safety-net providers (Table 1, columns three and four).

Historically, Partnership has had strong relationships with the physician community. It built on those relationships to encourage participation in the intervention and also gave practices a small financial incentive—a quality bonus per member per month—for implementing PHASE as a quality improvement project.[5] However, as several Partnership staff noted, the plan could not force protocols on physicians as a staff or group model plan might. Physicians agreeing to participate appeared to have an interest in improving quality of care for diabetic patients. One participating physician noted that the intervention helped streamline the practice's processes "for upcoming pay-for-performance initiatives and also to learn care models that could be expanded clinic-wide."

[3] Among states with Medicaid managed care, California's capitation rates are in the lowest third.

[4] While it was somewhat difficult to recruit participating practices for the intervention, Partnership wanted a manageable number of practices, as each required support and followup on a weekly or biweekly basis.

[5] The quality bonus, which is based on four indicators, can total up to $1.67 per member per month (for a practice's entire patient panel) if a practice pursues all four indicators. Participation in a quality improvement project such as PHASE counts as one of the four indicators.

TABLE 1

CHARACTERISTICS OF PHYSICIAN PRACTICES PARTICIPATING IN PARTNERSHIP'S PHASE INTERVENTION

Practice or Physician	County	Urban/ Rural	Safety-Net Provider	Number of Participating Physicians/Number of Physicians in Practice	Primary Intervention Activities	Existing Registry or Other Tools
Community Medical Center (Vacaville)	Solano	Mix	√	1/1	• Flow sheet from registry used to direct activities during visit • Diabetic/hypertension patient questionnaire given to patients during each office visit • Self-management questionnaire given to selected number of patients each month • Annual depression screening (PHQ-9)	PECS (i2i Tracks soon)
Woodland Health Care Blevins Group	Yolo	Rural		1/5[a]	• Visit plans used to direct activities during visit • Schedule target patients for 30-minute appointment annually • Use of action planning during visit to promote self-management • Provide PHASE education materials as needed • Use of foot examination reminder in chart as needed • Depression screening (PHQ-9) (frequency unclear)	CDEMS
Dr. Johnson (Fairfield and Vacaville)	Solano	Urban and Mix		1/4	• Use of flow chart decision tree in patient chart to ensure PHASE implementation • Record patient body mass index in chart • Document patient self-management activities	None (will use DocSite)
Drs. Velarde and Carandang (Vallejo, American Canyon)	Solano, Napa	Urban Mix		2/2	• Use of green chart covers for patients with diabetes/cardiovascular disease • Use of flow chart/decision tree in patient chart to ensure PHASE implementation	None
Dr. Paukert (Napa)	Napa	Rural		1/3	• Monthly meetings with staff to discuss diabetes patients • Reminders in patient charts about needed laboratory tests • Depression screening of patients (frequency unclear)	Electronic medical record
Winters Health Care Foundation	Yolo	Rural	√	1/1	• Use of flow chart/decision tree in chart to ensure PHASE implementation • Health maintenance reminders in electronic medical record when laboratory tests and so forth are missing or out of date • Development of group visits that will include patient education	Electronic medical record

[a]While only one of five physicians from this practice participated in PHASE, eligible patients of all five physicians were included in the treatment group, given that Partnership only had information on patients' assignment to the practice, not the individual physician.

Several other organizations also participated in this project. Kaiser Permanente staff participated directly by providing PHASE tools and materials, and attending Partnership's quarterly diabetes coalition meetings.[6] In addition, while state Medicaid (Medi-Cal) was not involved in the project, local entities, such as county nutrition services and the Solano Coalition for Better Health, participated in the quarterly meetings and played a supportive role. For example, county nutrition services provided nutrition counseling sessions for provider teams in several participating practices.

The PHASE intervention operated at the same time as existing patient-focused services that aimed to improve diabetes care for Partnership members. LifeMasters, a disease management vendor with which Partnership has contracted since July 2005, operates a patient-based disease management program for Partnership's non-dual members with diabetes or congestive heart failure. LifeMasters's telephonic intervention is aimed at helping patients better manage their conditions through counseling, coaching, and patient education. LifeMasters also participated in quarterly diabetes coalition meetings to improve coordination of practice interventions and outreach to patients.

PROGRAM INTERVENTION

In contrast to many other MVP interventions, Partnership's intervention was a provider-based rather than patient-based intervention. Partnership's role in the intervention involved training participating practices on performance improvement models, PHASE protocol, and providing support for the process changes each practice decided to pursue to reach PHASE goals. While practices decided which activities to pursue, common intervention activities focused on encouraging providers to (1) use registries to monitor their diabetic patients; (2) use a visit planner, which is a sheet inserted into the medical chart that indicates suggested medications, laboratory tests, and so forth; (3) flag medical charts to indicate the need for specific laboratory tests or other protocols; and (4) counsel patients on diet and exercise. One important aspect of the intervention was that it afforded physicians the flexibility to decide what process changes they should make to meet program goals, thereby allowing them to tailor their activities accordingly. Such flexibility was crucial in Partnership's gaining and maintaining physician engagement and improved the prospects for sustainability beyond the timeline of the MVP project.

Practices generally implemented their intervention activities through a team of two at each practice site: the participating physician and an associated nurse or medical assistant. Participating teams varied substantially in the amount of activity and process change that occurred under the intervention. (See last two columns of Table 1 for more information by practice.) One team, for example, modified its registry to monitor diabetic patients' laboratory tests and medications, included visit plans in each patient's chart, conducted depression screenings of diabetes patients, and increased counseling of patients on diabetic self-care issues. At the other end of the spectrum, another team made little progress in changing the process of

[6] The quarterly meetings included all practices participating in PHASE, as well as practices pursuing other diabetes interventions and activities.

care because it lacked any registry or electronic health record to effectively track diabetic patients. This variation in intervention intensity (among other factors) limited our ability to infer whether differences in outcomes over time or across the intervention and comparison groups were attributable to the intervention or occurred by chance.

After securing physician participation, Partnership provided its eight participating physician practices with PHASE training and associated tools, and offered ongoing assistance as needed (contacting each physician/nurse team every one to two weeks, on average). In addition, participating practices attended a quarterly diabetes coalition meeting to discuss any issues with implementation and to share ideas; such peer-to-peer learning reportedly was important for practices. In addition, Kaiser and other external groups also participated in the quarterly meetings. The intervention officially began in January 2006, though practices were at that time (and continue to be) at different stages or levels of intensity in implementing PHASE.

As a provider-level intervention, PHASE did not require patient outreach. Instead, PHASE activities and monitoring were implemented in the context of routine care delivery during physician visits. Participating physicians may have provided patients with education materials on, for example, nutrition and exercise, depending on patients' individual needs. As such process changes were made, the intent was for intervention activities to become part of the physicians' routine practice. In fact, while PHASE targeted diabetic patients, one participating physician indicated that other (non-diabetic) patients with chronic conditions are undoubtedly benefiting from the process changes made under PHASE.

PROCESS AND OUTCOME MEASURES

Partnership's process and outcome measures aimed to determine how well the effort addressed each of its three intervention goals (see outputs and short-term outcomes in Figure 1). Process measures included the proportion of patients who had laboratory tests (including Hemoglobin A1c [HgA1c] and low-density lipoprotein [LDL] tests), and had claims for medications (including ACE inhibitors, statins, and beta blocker).[7] Outcomes measured by Partnership were the proportion of patients with controlled HgA1c and LDL levels (among those with tests). Partnership staff believe that the intervention will ultimately lead to improved health status and quality of life and lower health care costs for targeted patients, per Kaiser's findings on the PHASE program. However, these outcomes would occur over a much longer time period and therefore were not measured as part of this initiative.

For all measures, Partnership examined changes over time, as well as differences between patients in the intervention clinics as compared with non-dual eligible patients in all other clinics with which Partnership contracts (excluding Kaiser clinics). The comparison group consisted of almost 90 practices serving approximately 1,650 patients with diabetes where the number of physicians ranged from one (like most of the intervention sites) to five or more. The number of clients served in comparison group clinics varied more than in intervention clinics because of the

[7] HgA1c, LDL levels, and use of the mentioned medications are clinically recommended quality markers for patients with diabetes and cardiovascular disease.

handful of large practices in the comparison group. The variation in practice size between the intervention and comparison groups is another factor that made inference on reported outcomes difficult. Larger practices might have more resources available to implement protocols than smaller practices, suggesting that the composition of the intervention and comparison groups might have been too different at baseline to make inferences over the intervention period.[8]

Given that the available data did not fully capture how participating practices interacted with patients, measurement of the intervention's effects was somewhat limited. For example, most of the practices implemented depression screening of targeted patients, but data on screening rates were unavailable. Similarly, promoting lifestyle changes was a major component of the PHASE protocol, but because data on patient education or similar activities were stored in practices' registries or electronic medical records, they were cumbersome and Partnership lacked direct access to such information.

Process and outcome measures that Partnership did report provided little evidence that the intervention had an effect over the 12 months ending March 2007, compared with usual care provided by comparison group clinics (Table 2).[9] For example, the change from baseline to followup in the proportion of patients with HgA1c tests was not meaningfully different in the intervention group (5.4 percent) compared with change in the comparison group (7.1 percent). Likewise, changes in the proportion of diabetic patients with an LDL test were also not very different between the intervention and the comparison groups.

Not surprisingly, little change in these two process measures also translated into few meaningful differences in their respective outcome measures. Among patients with an HgA1c test, there was a small increase (1.9 percent) in the proportion with controlled HgA1c, compared with a small drop in the comparison group (1.4 percent); but this trend was likely not significant and not a meaningful change.[10] Trends were even less favorable for the controlled LDL measure among patients with an LDL test. The proportion of patients with controlled LDL in the intervention group, compared to baseline, fell by 5.6 percent compared with a 10.6 percent rise in the comparison group.[11] Because these measures are often the most difficult to change, it is likely that the MVP intervention time period was too short to expect changes due to the intervention.

Reported prescription drug utilization measures also suggested that the intervention did not have much of an effect on patients in intervention clinics compared with those in comparison group clinics. Changes from baseline in the proportion of patients with either ACE inhibitor, statin, or beta blocker prescriptions were either smaller or not considerably different from the

[8] Partnership reported that it did not have the ability to separate small and large clinics from its comparison group due to its data systems limitations.

[9] Due to the problems with its reporting systems, Partnership was unable to report tests of significance for any intervention-comparison differences. However, given the size of its study population and the small differences between the intervention and comparison groups' outcomes, it is likely that none of the differences were statistically different from one another.

[10] HgA1c was defined to be in control if the value was less than 9 percent.

[11] LDL was defined to be in control if the value was less than 100 mg/dL.

proportion of comparison group patients with these prescriptions. In addition, the increase in the proportion of patients with fills for all three prescriptions was only slightly higher in the intervention group compared to the comparison group (33.3 percent versus 30.6 percent), but is likely not indicative of a program impact, since this pattern was not consistent for each individual drug class. The lack of promising outcomes may reflect the relatively small number of patients receiving the PHASE treatment in the participating practices, the fact that some participating practices engaged in less intensive intervention activities than others, and that Partnership chose to compare smaller practice sites to a mix of small and large ones. Given these concerns, it is important to consider these findings in context of the intervention as a whole. In particular, a more thorough investigation of how the intervention was conducted at each clinic might offer insight as to why outcomes did not improve.

INTERVENTION CHALLENGES

While it seems possible to adapt PHASE to the Partnership context, implementation proved to be more challenging than expected, especially as Partnership had relatively little leverage over participating practices. Yet, given that Partnership relied on an existing and well-developed intervention, it could draw on existing materials and experiences (Partnership staff noted that Kaiser Permanente was willing to share this information). Kaiser, however, developed the intervention in the context of a staff model health plan. As a network model plan, Partnership's structure differs markedly from Kaiser's structure, making implementation of PHASE in independent practices difficult. Several individuals involved with the intervention noted that Kaiser can more easily and uniformly implement PHASE across practices because Kaiser (1) already maintains an electronic information technology system, (2) can require its physicians to follow the PHASE protocol, and (3) employs chronic disease management staff whose responsibilities include tracking diabetic patients. Conversely, participating clinics in Partnership's PHASE intervention relied on different systems (some without a registry or electronic medical records). Moreover, participating practices were small, with few office and nursing staff, most of whom were already stretched with existing responsibilities.

An additional challenge was the possibly confounding impact of the LifeMasters disease management program on patient outcomes. Patient education activities under LifeMasters and PHASE may have been duplicated, depending on the extent to which participating physicians in PHASE actively educated patients. However, some viewed the two programs as complementary, given that LifeMasters targets patients and PHASE targeted providers—thereby attempting to influence diabetes care through several means. Nonetheless, as outcome measure results seem to suggest, the PHASE intervention was likely not powerful enough to have an effect beyond any effect that might be associated with the LifeMasters program (though we cannot quantify this either).

Finally, the PHASE intervention occurred alongside other projects and activities. For example, half of the practices participating in PHASE were also a part of a self-management project for which Partnership received funding from the California HealthCare Foundation. In addition, one participating practice and several practices from the comparison group were involved with Partnership's diabetes collaborative. With activities occurring in both the

treatment and comparison practices, the various projects likely confounded the benefits of PHASE and masked any positive developments.

CONCLUSIONS

Given the small number of physicians that participated in the intervention, the variability with which they implemented PHASE, and the fact that LifeMasters may have improved care for all non-dual eligible diabetic patients overall, it is not surprising that the intervention did not demonstrate any meaningful differences over time between patients at treatment and comparison clinics. Nonetheless, the intervention provided Partnership with important qualitative information on implementation challenges and how those challenges varied across the physician practices with which it contracts. In fact, Partnership shared findings and lessons from PHASE during a regional conference on best practices in disease management in the fall of 2006. In addition, although the intervention focused on diabetic patients, potential impacts might possibly be broader; practice changes made as part of PHASE may also affect non-diabetic patients with chronic conditions, as well as non-Partnership patients. (However, these broader impacts were not measured.)

While Partnership faced several challenges in implementing PHASE, several lessons emerged. First, Partnership found that involving a team from each office—rather than just the participating physician—promoted ownership and helped office staff better understand the intervention. Second, of PHASE's three goals, participants reported that promoting lifestyle changes was the most difficult goal to achieve; counseling requires time, and some physicians were uncomfortable in the role of counseling patients. Moreover, there generally was no optimal way to track counseling activities (in the registry or medical record) except through notes in patient charts (for which data abstraction is generally expensive). Finally, Partnership realized the importance of coordinating the PHASE intervention practices with the LifeMasters activities and tried to promote collaboration between groups to avoid duplication of effort.

Given that Partnership allowed participating physicians to tailor PHASE activities to their own practices and to move at their own paces, the changes made in how providers worked with patients were typically incorporated into the care process and appear to have a reasonable chance at being sustained beyond the end of MVP. Moreover, Partnership will continue to offer a quality bonus to participating practices, as well as new practices that want to implement PHASE in the future, which should also help promote sustainability. The extent to which the intervention is generalizable or scalable, however, remains unclear. Physicians were actively recruited to participate in the intervention, and those who agreed to participate formed the intervention group; these physicians may differ systematically from others in Partnership's network and therefore may not be representative of the network of physicians as a whole. The intervention activities may also require physicians to spend more time with their patients—in activities such as patient counseling—and some physicians may be reluctant to do so. In the words of one participating physician, "I'm not sure how successful an expansion would be . . . I think it will be hard to get other providers to buy in. . . ." Partnership therefore must carefully consider how best it could expand the intervention in the future or encourage practices to adopt the most successful components of process change for additional patient populations or as part of other quality improvement programs.

REFERENCES

Holohan, John and Shinobu Suzuki. 2003. "Medicaid Managed Care Payment Methods and Capitation Rates in 2001." *Health Affairs*, vol. 22, no. 1, 2003, pp. 204–218.

TABLE 2

BASELINE AND INTERVENTION PERIOD MEASURES FOR THE INTERVENTION AND COMPARISON GROUPS AS OF MARCH 2007
(Percent of Patients)

	Intervention Group				Comparison Group			
	Sample Size	Baseline	Intervention	Percent Difference	Sample Size	Baseline	Intervention	Percent Difference
HgA1c Test Conducted	226	74	78	5.4%	1,656	70	75	7.1%
HgA1c in control (<9%) among those tested	177	54	55	1.9%	1,239	71	70	–1.4%
LDL Cholesterol Test Conducted	226	75	73	–2.7%	1,656	64	67	4.7%
LDL cholesterol in control (<100 mg/dL) among those tested	165	36	34	–5.6%	1,110	47	52	10.6%
Filled Pfor:								
ACE inhibitor	226	64	64	0.0%	1,656	57	59	3.5%
Statin	226	49	55	12.2%	1,656	47	53	12.8%
Beta blocker	226	26	28	7.7%	1,656	31	36	16.1%
ACE inhibitor, statin, and beta blocker	226	12	16	33.3%	1,656	13	17	30.8%

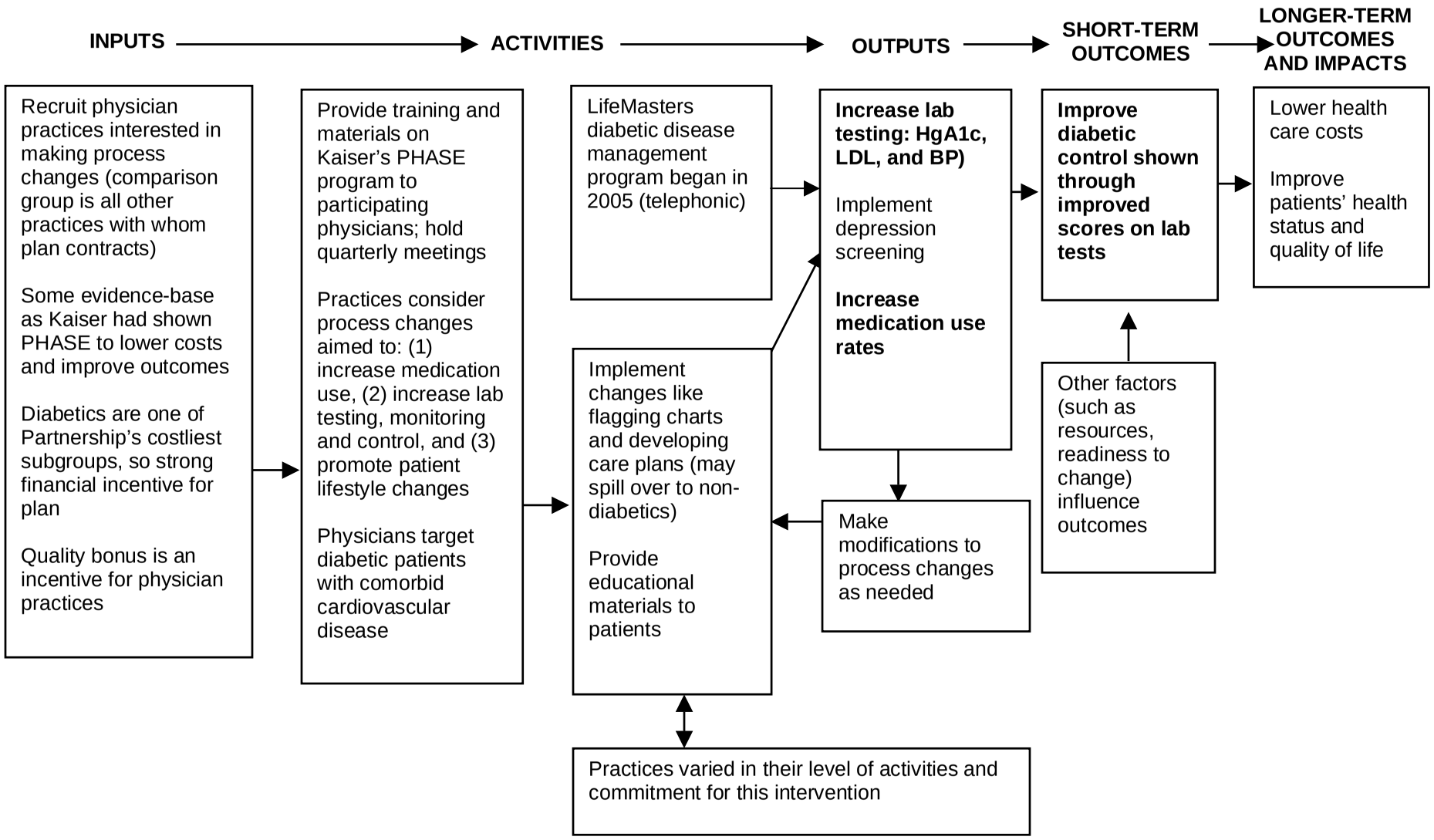
Source: Partnership MVP reporting template.

Note: Baseline measures are for calendar year 2005 and intervention period measures are for April 2006 through March 2007. Partnership also reported rolling 12-month values for each intervention quarter, but these measures are by-and-large representative of reported values. Intervention group patients include all nondual eligible patients with diabetes in intervention clinics and comparison group patients include all nondual eligible patients in non-Kaiser clinics. Partnership did not have enough individual-level data to conduct tests of statistical significance for any of its measures.

ACE = Angiotensin-Converting Enzyme; HgA1c = hemoglobin A1c; LDL = low-density lipoprotein.

FIGURE 1

LOGIC MODEL OF PARTNERSHIP HEALTH PLAN'S PHASE INTERVENTION



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

UCSD'S IMPACT + PROJECT DULCE INTERVENTION

Researchers from the University of California San Diego (UCSD) Department of Family Medicine and the Clinical Research Department and Project Dulce at The Whittier Institute for Diabetes, partnered with four non-profit community clinics in San Diego County that have disproportionate numbers of Latino and Asian patients (which include Medicaid, Medicare, and uninsured patients) to implement a depression treatment program known as IMPACT (Improving Mood-Promoting Access to Collaborative Treatment). This Medicaid Value Program (MVP) intervention aims to identify depression and provide depression care management for patients with diabetes (regardless of insurance status) who are already receiving diabetes case management services. Through the treatment of depression, the intervention's goals include reducing patients' depressive symptoms, and in doing so, improving their diabetes self-management, lowering health care utilization and costs, and improving overall health status.

All four of the participating clinics offer Project Dulce—a culturally-specific diabetes case management program focused on Latinos—to their patients. For this project, patients who participate in Project Dulce and screen positive for depression were offered IMPACT. Initially, UCSD planned to randomly assign two clinics to a treatment group (where patients would receive Project Dulce and IMPACT) and two to a control group (where patients would receive Project Dulce only), but one control clinic balked at not providing services. UCSD subsequently changed the project's research design so that patients from three clinics were to receive IMPACT and Project Dulce (forming the intervention group), while those at the fourth clinic were to receive only Project Dulce services (forming the comparison group). However, due to a small sample size, the comparison group was dropped from the study at the end of MVP.

Both Project Dulce and IMPACT have been studied independently. Existing research suggests that Project Dulce patients show improvements in hemoglobin A1c, blood pressure, and cholesterol levels, compared to a retrospective cohort of patients drawn from historical data (Gilmer et al. 2005); and that IMPACT patients experience a reduction in depressive symptoms and functional impairment and an improvement in quality of life compared with usual care (Unutzer et al. 2002). IMPACT, however, has not been studied extensively in non-commercially insured populations, such as those served in the San Diego County clinics.[1] Moreover, Project Dulce and IMPACT have not been studied as a combined diabetes and depression management program.[2]

[1] Existing research on Project Dulce's effects has focused on non-commercially insured populations.

[2] Note, however, that some research has examined IMPACT's effect on depressed adults with selected comorbidities; for example, Katon and colleagues (2006) conducted a subgroup analysis of patients with diabetes receiving IMPACT compared to those receiving usual care.

ORGANIZATIONAL CONTEXT

UCSD staff, which helped coordinate the IMPACT + Project Dulce intervention and are leading a research study of it, have no explicit financial incentive to pursue this work beyond the grants received to do so. However, staff have a strong academic interest in studying this and similar interventions. The incentive for participating clinics, likewise, is not financial; rather, clinic staff have long recognized a gap in patients' mental health care for conditions that are less dire than serious mental illness (such as schizophrenia). Historically, the clinics have lacked the resources to provide depression care and, as one staff member stated, the MVP project "really completes what we can do for our patients." Accordingly, clinic staff were generally reported to be supportive of the IMPACT intervention.[3]

Unlike a health plan or system that might have the financing available to fund a pilot intervention (especially if there is a strong potential business case for such work), UCSD and the participating clinics do not have such resources. Rather, The California Endowment (a large, private foundation) provided the financing for this intervention.

In launching this intervention, UCSD worked closely with several local organizations. Beyond the community clinics themselves, its most prominent partner was the Whittier Institute for Diabetes, located in San Diego, whose mission is "to improve the quality of life for people with diabetes through innovative education programs, clinical care, research, and collaborations that pursue prevention and a cure."[4] Among other activities, the Whittier Institute runs Project Dulce in San Diego's community clinics. UCSD and Whittier Institute staff have worked together for the past several years, studying the effects of Project Dulce. Moreover, the Whittier Institute has been integrally involved in launching the IMPACT + Project Dulce intervention; Whittier staff supervise the IMPACT staff and facilitate cooperation between Dulce and IMPACT staff.

For this project, UCSD and Whittier Institute staff created an advisory board to provide guidance and resources as necessary, and to resolve any implementation issues that arise. In addition to UCSD and Whittier Institute staff, the advisory board included representatives from the Council of Community Clinics (which represents the independent clinics of San Diego County), San Diego County Adult and Older Adult Mental Health Services, the Hospital Association of San Diego and Imperial Counties, and The California Endowment (which is funding much of the intervention).[5] The advisory board generally met on a quarterly basis.

In California, county entities manage local mental health services. Historically, little to no funding has existed for mental health services in primary care settings, and there has been almost no cooperation between community clinics and the mental health system (both at the county and

[3] Before the intervention, UCSD staff did a presentation on IMPACT to the medical director, CEO, and head of nursing in each clinic, and subsequently presented several lunchtime lectures for clinic physicians.

[4] See http://www.whittier.org/

[5] State Medicaid was not involved with this MVP intervention, even though one-third of patients in the participating community clinics are Medicaid beneficiaries. UCSD may try to obtain claims data from the state to examine utilization and costs in the future.

state levels). Only limited mental health services are available through primary care settings, and these are restricted to persons with Medicaid (Medi-Cal) coverage. County-funded mental health treatment for Medi-Cal beneficiaries and the uninsured focuses on treating serious mental illness in specialty settings. This relationship could change, given the passage of a California ballot initiative known as Proposition 63, now called the Mental Health Services Act, in November 2004. This was an important development in mental health care in the state that could help fund the intervention in the future. This act allows the state government to levy a 1 percent tax on personal income over $1 million to fund expanded mental health services for mentally ill children and adults. The passage of this ballot initiative has resulted in millions of dollars of funding for mental health services (including those services provided through primary care), and these monies are making their way to San Diego County programs. Currently, many projects (including IMPACT) are simultaneously vying for Mental Health Services Act funding.

PROGRAM INTERVENTION

Since the intervention layers IMPACT onto Project Dulce, one can consider Project Dulce the baseline program or "usual care." Project Dulce emphasizes self-management with a nurse-led team that includes a registered nurse who is a certified diabetes educator, a bilingual medical assistant, and a bilingual dietitian. Patients in Project Dulce have an initial nurse visit and are asked to return for additional visits with the nurse and dietitian. Telephone contact is used for appointment reminders and to answer specific questions. In addition, Project Dulce uses peer educators to teach diabetes self-management classes. Project Dulce's focus is on diabetes; there is no specific provision to identify and treat depression among patients in the program.

The MVP intervention targeted patients with diabetes who (1) were already enrolled in the Project Dulce disease management program at one of the four participating clinics and (2) screened positive for depression. Patient identification for the MVP intervention occurred when Dulce patients who came to the clinic for office visits were screened by the clinic's medical assistant using the Patient Health Questionnaire (PHQ-9), a short survey of nine questions to assess depressive symptoms. Those who screened positive for depression (approximately one-third of those screened in the first few months of the intervention) were considered part of the target population.[6] (See Figure 1 for information on intervention activities.)

Project Dulce patients who screened positive for depression at an intervention clinic were considered part of the intervention group and received IMPACT services, and those who screened positive at the comparison clinic formed the comparison group and received only Project Dulce services.[7] Patients were not expected to cross over between intervention and

[6] Those whose PHQ-9 responses result in a score of 10 or above were considered a positive screen. Those who screened positive but reported active substance abuse problems or a history of serious mental illness (such as schizophrenia or bipolar disorder) were not eligible for the intervention because such problems likely require more intensive treatment than that provided through IMPACT.

[7] The original study design included random assignment of two treatment clinics and two control clinics. Staff at one of the clinics initially assigned as a control clinic, however, were not comfortable with screening patients for depression but then offering no depression services for those who screen positive. This resulted in a design of three

comparison clinics, given their geographic locations and the fact that patients in the target population typically seek care at their neighborhood clinic.

In the "pure" IMPACT model, physicians are actively involved with the initial patient assessment and prescribing of treatment. In IMPACT + Project Dulce, patients receive ongoing care from a Project Dulce nurse, who works closely with the primary care physician who oversees patient assessments and treatment plans. Therefore, IMPACT + Project Dulce reflects the patient care system used in Project Dulce.

A bilingual depression care manager (with a master's degree in social work) works closely with those patients assigned to receive IMPACT. The depression care manager schedules a visit with the patient to conduct an initial assessment based on clinical and psychosocial history, review education materials, and discuss patient preferences for treatment (medication and/or individual or group psychotherapy). The depression care manager also works side-by-side with Project Dulce nurses in the clinics; patient visits to the depression care manager occur at the same location as the patient's Project Dulce activities. As in Project Dulce, the physician then reviews the assessment and treatment plan and writes prescriptions if needed. New patients who do not have an ongoing relationship with the diabetes nurse or a primary care physician at the clinic are scheduled for a primary care provider (PCP) visit. This system represents a modification of the original IMPACT model and could influence its outcomes.

After the initial assessment, the depression care manager develops a treatment plan with the patient to match that patient's preferences. Three primary approaches that can be used independently or in combination include:

- Problem-solving therapy: a one-on-one therapy approach in which the patient and depression care manager make a list of problems and think through solutions
- Behavioral activation: a therapy in which the depression care manager gets patients to begin participating in activities which they formerly engaged in and enjoyed
- Antidepressant medication

The depression care manager works with intervention patients for three to four months, on average, with occasional followup (such as monthly telephone calls to patients) after that time.

In carrying out IMPACT activities, the depression care manager works closely with Project Dulce nurses at each clinic.[8] The depression care manager also works with the patient's primary

(continued)
intervention clinics and one comparison clinic, but the number of patients recruited at the comparison clinic was small by April 2007. Because of this small sample size, the comparison group was dropped near the end of MVP.

[8] The depression care manager rotates between intervention clinics. Specifically, she spends two days per week at the largest clinic (Neighborhood Healthcare in Escondido), one day each at the two remaining intervention clinics (Linda Vista Healthcare and Mid City Community Clinic), and one day per week meeting with a consulting psychiatrist and other staff about her caseload and handling administrative duties.

care physician to develop a treatment plan and monitor the patient's progress.[9] In addition, the depression care manager participates in Project Dulce's monthly meetings.

Screening and enrollment for the intervention began in July 2006. While the initial design estimated the number of patients in the intervention and comparison groups as 200 in each group, 113 patients were enrolled in the treatment group as of April 2007. Enrollment, however, was still ongoing as of this report, as Project Dulce patients come for office visits at the clinics. Depression screening of Project Dulce patients in the comparison clinic began in December 2006; however, as of March 2007, only 15 patients were enrolled in the comparison group, which was subsequently dropped around June 2007.

PROCESS AND OUTCOME MEASURES

As shown in Figure 1, IMPACT + Project Dulce aims to improve depression care and reduce patients' depressive symptoms, thereby allowing patients to better manage their diabetes. Consequently, the intervention may reduce health care utilization and costs over the longer term, and ultimately improve patients' mental and physical health and quality of life.

UCSD's process measures for this intervention included enrollment rates, depression care manager productivity (as measured by the number of patient contacts), and the proportion of patients with depression care plans (including the number by type of treatment chosen). Outcome measures included patient self-assessment measures (including measures of depressive symptoms, diabetes self-management, and overall health status) and cost and utilization measures (such as outpatient utilization and cost, and emergency room utilization), as measured through clinic data, since many participating patients are uninsured and did not have Medicaid claims. However, the lack of a centralized database across participating clinics made it difficult to collect claims-based outcome data and UCSD staff were not able to report these measures for MVP (UCSD staff reported that the earliest they would have these measures would be the fall of 2007.)

Reported process measures provide important information about how the program was implemented in its first 10 months. For example, the care manager developed a care plan for depression for all intervention patients as of April 2007. She made an average of 3.3 follow-up visits per patient (which, when you add the original assessment visit, means that the average number of visits per patient was more than 4); 90 percent of visits were in-person. With a total sample of 100 patients and a rate of 4 visits per patient over 10 months, the depression case manager visited with more than 3 patients per day over a three-day work week. As this excludes the time needed to discuss care plans with Dulce staff and likely uneven enrollment over time (fewer enrolled in the first few months), it appears that this intervention was rather intensive. The most common therapy was behavioral activation (64 percent), followed by problem solving

[9] In two clinics, the depression care manager also works with the clinic's primary care physicians. In the third clinic, the depression care manager works primarily with the Project Dulce nurses who then communicate with the clinic's primary care physicians.

therapy (57 percent), and antidepressant medication (31 percent).[10] Almost two-thirds of patients in the intervention group received more than one type of therapy at the same time.[11]

By April 2007, only 19 intervention group patients had enough intervention exposure to have a 6-month follow-up visit. Among these patients, PHQ-9 scores fell by an average of 7.8 points (nearly a 50 percent decrease) compared with baseline values. The depression care manager made more than one visit per month (an average of 6.3 visits) to these patients over the six-month period, a further indication of the intervention's intensity.

INTERVENTION CHALLENGES

UCSD's intervention faced several challenges. The most fundamental was that the project team did not obtain funding for the intervention until the spring of 2006 (when The California Endowment awarded a grant for the program), delaying start-up of the intervention. A second delay came when funding for primary care visits and medications, which was anticipated to come from the county in July 2006, was not made available until February 2007. This added significantly to the operations and funding challenges that had to be overcome before the intervention could start. Funding aside, the set-up necessary to implement this type of intervention was substantial. According to one stakeholder, staff was "a little unrealistic [about] how much work is needed to make something like this happen." Specifically, the interests and desires of various stakeholders (such as clinic staff, county mental health services, and the Whittier Institute) had to be aligned, the cooperation of clinic staff had to be secured, and so forth.

Another challenge was the lower than expected prevalence of depression (about 30 percent of screened patients rather than the 40 to 50 percent expected) in the target population. Lower prevalence of depression was one factor in lower than anticipated enrollment (113 intervention group patients as of April 2007). However, other factors included: (1) clinics only started screening and enrolling patients beginning in July 2006, and (2) the depression care manager spent the first couple of months handling the many administrative details of starting a program (such as meeting with clinic staff and arranging for physical space in each clinic), rather than making sure depression screening and enrollment were occurring. On a positive note, only a few patients who screened positive refused to participate, either because they were already receiving treatment for depression or could not find a convenient time to meet with the depression care manager for an initial assessment. Moreover, within less than a year, UCSD was more than half way to its goal of 200 intervention group patients with only one depression care manager (though it had much less success in identifying comparison group patients).

[10] While problem-solving therapy is generally considered integral to the IMPACT program, less than two-thirds of patients receive this therapy. Intervention staff report that it requires patients to actively consider and weigh the pros and cons of various actions. This type of critical thinking is reportedly difficult for many of the intervention patients, given their very low literacy levels.

[11] A total of 34 patients received behavioral activation and problem solving therapy, 19 received behavioral activation and antidepressant therapy, and 18 received problem solving and antidepressant therapy.

The delay in screening patients at the comparison clinic arose for a few reasons. First, a medical assistant was not available to conduct depression screening at this clinic. Second, some clinic staff members were surprised at the depression severity at the intervention sites and were concerned about what might happen if fewer resources were available for suicidal patients at this clinic (compared to the intervention clinics). As a result, UCSD and Whittier staff worked with clinic staff to develop an emergency protocol for suicidal patients. While staff resolved these issues, the depression screening that began at the comparison clinic in December 2006 resulted in very few patients enrolled in the comparison group due to nurses not screening patients as frequently as the project team expected and a smaller than expected group of patients at that clinic. UCSD ultimately decided to drop the group from the study. Staff recommended the use of patient incentives in the future to increase the likelihood that goals are met for recruitment and retention of a comparison group.

An additional challenge was the lack of funding for primary care physician visits and medications related to depression for uninsured patients (including those receiving county medical services), which represented 80 percent of patients receiving the treatment. Consequently, uninsured patients in the intervention group either had to pay out-of-pocket for a physician office visit and medications or skip visits and do without drugs. One intervention clinic was particularly cooperative and willing to obtain medications for these patients through pharmaceutical companies' patient assistance programs and free samples, and monitoring patients in combination with existing pharmaceutical management of diabetes. However, leadership at a second clinic with less infrastructure and fewer resources was less willing to prescribe medications when patients could not afford them and patients were not under the direct care of a primary care provider. A third clinic was not as resource-constrained as the second, but also not as generous as the first in terms of its ability and willingness to accommodate the intervention.

CONCLUSIONS

This MVP intervention represents an innovative approach that combines two existing programs and assesses the marginal benefit of adding IMPACT to Project Dulce. Although the project start date was delayed, many of the stakeholders involved had worked together for several years, so relationships were already established. Along these lines, several staff members have suggested that Project Dulce nurses have been quite cooperative with the IMPACT program and have worked well with the depression care manager (and the relationships between the nurses and the depression care manager have, in fact, improved over time). Moreover, the many people with whom the depression care manager can consult have reportedly been extremely helpful, including a family physician/psychiatrist who volunteered hours to assist at the start of the program (and later was funded by savings and adjustment to the original budget), a psychiatric nurse practitioner from Kaiser Permanente who implemented IMPACT within that plan, and Whittier staff.

Clearly, the slow start of the intervention and the small number of enrollees represent significant challenges, particularly the ability to detect differences in outcomes over time to determine whether the intervention was effective. Also, given the challenges with providing medical services to the uninsured patients in the intervention group, it is not entirely clear what

type of impact the intervention might have on these patients over time. Moreover, without a comparison group, it will be difficult for research staff to argue that any differences in outcomes were not due to regression to the mean.

Sustainability of this MVP intervention is largely a matter of funding. The existence of Mental Health Services Act funding—a potentially sustainable funding source for years to come—may be an important way to expand the program in the future, particularly if UCSD demonstrates that the intervention has a favorable impact on patient outcomes. The IMPACT model (applied to all patients rather than just those in Project Dulce) also appears to have strong potential for expansion to other San Diego clinics—provided funding is available— given growing interest by the Council of Community Clinics. Moreover, the intervention's approach appears generalizable to other San Diego County clinics with similar safety net settings, though modifications to the original IMPACT model (such as lower rates of physician visits for an initial assessment or less access to medication among uninsured patients) must be carefully considered. In addition, the Whittier Institute appears quite committed to incorporating IMPACT into its existing Project Dulce programs in many clinics in the San Diego area—and Whittier staff have begun to think of IMPACT as a necessary and integral part of Project Dulce rather than an overlay on an existing program. While the challenges of this intervention have been many, it may still hold promise for improving care for depressed patients with diabetes.

REFERENCES

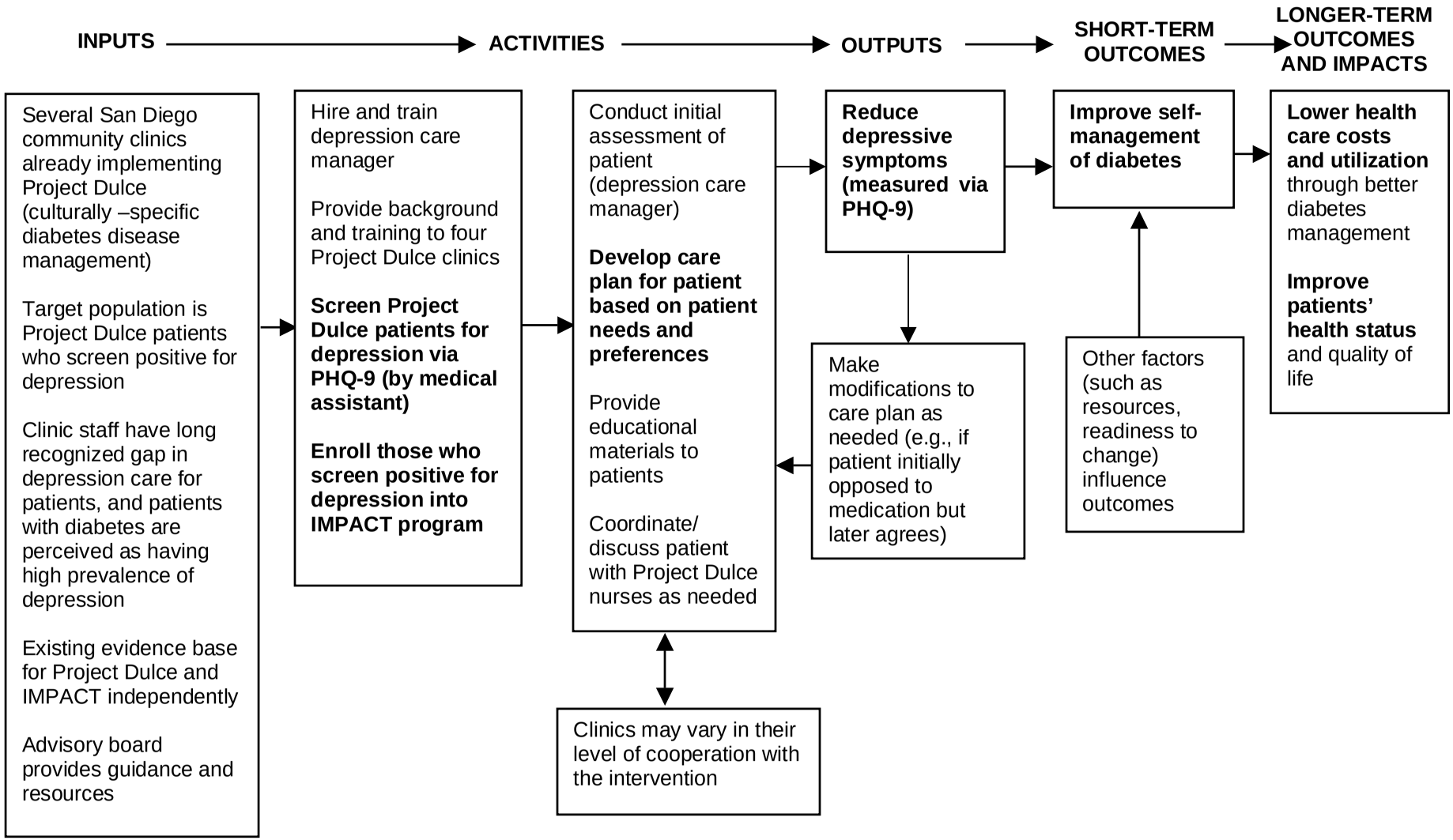
Gilmer, Todd P., Athena Philis-Tsimikas, and Chris Walker. "Outcomes of Project Dulce: A Culturally Specific Diabetes Management Program." *Annals of Pharmacotherapy*, vol. 39, no. 5, 2005, pp. 817–822.

Katon, W., J. Unutzer, M.Y. Fan, J.W. Williams, Jr., M. Schoenbaum, E.H. Lin, and E.M. Hunkeler. "Cost-effectiveness and Net Benefit of Enhanced Treatment of Depression for Older Adults with Diabetes and Depression." *Diabetes Care*, vol. 29, no. 2, 2006, pp. 265–270.

Unutzer J, W. Katon, C.M. Callahan, J.W. Williams Jr., E. Hunkeler, L. Harpole, M. Hoffing, R.D. Della Penna, P.H. Noel, E.H. Lin, P.A. Arean, M.T. Hegel, L. Tang, T.R. Belin, S. Oishi, C. Langston. IMPACT Investigators. "Collaborative Care Management of Late-Life Depression in the Primary-Care Setting: A Randomized Controlled Trial." *Journal of the American Medical Association*, vol. 288, no. 22, 2002, pp. 2836–2845.

FIGURE 1

LOGIC MODEL FOR UCSD'S IMPACT+ PROJECT DULCE INTERVENTION



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

WASHINGTON MEDICAID INTEGRATION PARTNERSHIP

The Washington Medicaid Integration Partnership (WMIP) integrates primary care, mental health, substance abuse, and long-term care services that are customarily provided separately in Washington State, for categorically needy aged, blind, and disabled (ABD) Medicaid beneficiaries in Snohomish County (north of Seattle). The Washington State Department of Social and Health Services (DSHS) contracted with Molina Healthcare of Washington (Molina Healthcare), a for-profit health maintenance organization focused on Medicaid and other vulnerable populations, to provide care coordination of these services to ABD beneficiaries. The primary motivating factor underlying the implementation of WMIP is the disproportionate use of health care by ABD beneficiaries who tend to have complex health profiles and are the fastest growing segment of the DSHS client base. While ABD Medicaid clients in Washington constitute 15 percent of the total Medicaid caseload, they account, according to state officials, for 35 to 40 percent of total fee-for-service expenditures.

DSHS reported that, before WMIP, ABD clients received substantial amounts of inappropriate care in emergency rooms and hospitals, due to lack of care management by physicians and nursing facilities and because patients were not aware of or did not know how to access the care available to them. For this Medicaid Value Program (MVP) intervention, DSHS is particularly interested in improving the use of mental health and substance abuse services as the need for these services is high among the target population and accounts for a considerable portion of their total costs. Prior research by DSHS suggests that increased use of substance abuse and chemical dependency treatment offsets its costs, and increased use of mental health care also results in cost savings.[1]

While the intermediate goals of the intervention include increased use of mental health care and substance abuse services, long-term objectives consist of improved patient quality of life and independence, reduced inpatient admissions and emergency room visits, and lower medical costs (Figure 1). WMIP began in January 2005 and had a monthly patient caseload of nearly 2,700 by April 2007. DSHS examined the impact of WMIP on patient outcomes by selecting a comparison group of similar patients from neighboring counties.

ORGANIZATIONAL CONTEXT

WMIP is one of the largest Medicaid pilot programs implemented in Washington State that involves multiple divisions within DSHS. The DSHS Health and Recovery Services Administration is implementing the intervention with cooperation and joint funding from the Aging and Disability Administration. The DSHS Research and Data Analysis Division is the lead for the evaluation process. All participating divisions (Mental Health, Home and

[1] Mancuso, D.C. and S.L. Estee. *Washington State Mental Health Services, Cost Offsets and Client Outcomes: Technical Report*. Washington State Department of Social and Health Services, Research and Data Analysis Division, Report Number 3.29, December 2003.

Community Services, Alcohol and Substance Abuse) are particularly interested in examining whether the care coordination services provided under WMIP can reduce inappropriate service use, such as avoidable emergency room use or unplanned hospital admissions that result in a large cost burden to all state health divisions.

Other organizations are also directly involved with WMIP. Molina, a subsidiary of Molina Healthcare, Inc. based in California, provides care coordination services to patients. It also operates a program for the Temporary Assistance for Needy Families (TANF) population (called *Healthy Kids Now!*) and a Medicare Special Needs Plan (SNP) in Washington. Molina Healthcare has never participated in such a project before, but believes WMIP is aligned with its core mission to serve the underserved.[2] In terms of incentives for participation, Molina Healthcare sees WMIP as an opportunity to expand its client base in Washington and further its corporate mission. Moreover, as a for-profit health maintenance organization, Molina Healthcare would benefit from demonstrating that its services can increase the quality of patient care while reducing costs.

The state created an advisory committee for WMIP in Snohomish County, consisting of local human services personnel, mental health providers, medical practitioners, long-term care practitioners (including individual providers and adult family homes) and patient advocates. The committee has provided DSHS information on how to best support clients with co-occurring disorders by reviewing WMIP materials and offering suggestions as to which services were most valuable to clients with multiple diagnoses.

PROGRAM INTERVENTION

WMIP integrates health care services (primary care, mental health, substance abuse, and long-term care) that are traditionally provided separately to Medicaid clients in Washington State through care coordination provided by Molina Healthcare. Uncertain of its ability to integrate these services effectively all at once, DSHS chose instead to phase in these components. Beginning in January 2005, WMIP enrollees could receive both primary and substance abuse care. Mental health care was integrated in October 2005 and long-term care was added in October 2006. Under WMIP, enrollees are eligible to receive all the same medical services that they would have received under fee-for-service Medicaid except that Molina provides a central point for care coordination and management.

Nondual ABD Medicaid beneficiaries, identified by DSHS, are auto-enrolled into WMIP, but have the option to opt out at any time. Dual eligible clients (eligible for both Medicare and Medicaid), Native Americans, and Alaskan Natives must opt into WMIP. To aid in recruitment, DSHS sent WMIP information booklets to 5,025 Medicaid-only members in November 2004 (and a total of 6,836 members by April 2005), with auto-enrollment set for January 2005.

[2] Molina Healthcare's corporate office, however, has implemented interventions and pilot studies with the Robert Wood Johnson Foundation and similar groups. Molina Healthcare also has participated in state-sponsored disease management collaboratives and in demonstration projects to create "medical homes" for children with special heath care needs. Since the start of WMIP, Molina Healthcare has also began programs for ABD clients in Texas and Ohio, applying lessons learned from WMIP to the implementation of those programs.

Molina Healthcare also recruited some duals through its Medicare SNP. DSHS staff reported that data systems barriers made auto-enrollment of long-term care patients problematic, so DSHS required them to opt into WMIP and manually adjusts the data systems.[3]

Because most participants are auto-enrolled into the program and normally are unaware of the availability of WMIP services until they are contacted by a Molina Healthcare staff member, patient outreach and engagement are critical. Molina Healthcare sends welcome letters and attempts up to three welcome calls to all enrolled patients within 30 days of assignment to the intervention. For those patients Molina Healthcare cannot reach by telephone (about 40 percent), it mails letters to their last known address with a request to call a Molina Healthcare care coordination team (CCT) member (12 to 20 percent called back within 4 to 6 weeks). Molina Healthcare also attempts to locate patients through physicians who previously served patients and hospitals where patients sought care (as identified through claims data). If patients opt out of WMIP, Molina Healthcare will not contact them again; however, the services remain available if patients later decide that they would like to re-enroll.[4]

Molina Healthcare's CCTs consist of a registered nurse or licensed mental health counselor and a care coordination specialist (a non-licensed staff member with a background in insurance or mental health care administration). These teams are supervised by an operations manager who monitors day-to-day activities, while a separate contracts manager is the primary liaison with DSHS for administrative issues. The CCTs provide care coordination services to WMIP clients. The primary mode of care coordination activities is by telephone, but patients in WMIP's long-term care component also receive in-person care coordination from team members. There are eight different CCTs that work with patients and a supervisor team that assists the other teams. Long-term care members were integrated into each team's caseload, but Molina staff reported that they were considering shifting all long-term care patients to two or three teams, possibly with two specialists assisting one nurse on each team. Care coordination teams are located side-by-side in the Molina Healthcare office, facilitating communication between team members and across teams.[5] The average caseload among teams that coordinate care by telephone is 350 to 450 patients per team, while the caseload for long-term care patients in person is expected to be approximately 80 to 100.

Molina Healthcare's care coordination program includes health risk assessment, monitoring of patient symptoms, and education. Molina Healthcare CCTs coordinate home care, inpatient care, skilled nursing facility placement, long-term care, disease management, mental health care, substance abuse care, durable medical equipment, transportation, and day health care for patients in WMIP. Molina Healthcare also offers a 24/7 nurse line to all members and the CCT follows up on all calls made to the line by WMIP members. The degree of contact with patients varies from patient to patient, depending on their conditions. At a minimum, Molina Healthcare staff contact patients whose conditions are most stable once per quarter. However, patients whose

[3] In April 2007, there were 225 long-term care patients enrolled in WMIP.

[4] Molina Healthcare staff reported that some patients have called them back seeking assistance after experiencing an adverse event, such as a hospitalization or an emergency room visit.

[5] Molina also has its Medicare SNP CCT (of two nurses and two specialists) located in the same space, allowing this team to learn from its WMIP peers and vice versa.

conditions are more fragile or require closer monitoring (approximately 30 percent of WMIP patients) are contacted at least twice per month or more often if needed. In interviews with them, Molina Healthcare staff reports that WMIP patients are largely unaware of many of the services available to them when they are first contacted, and that they often need help scheduling appointments, particularly after hospital discharge.

CCT members use a computerized data system when talking to patients over the telephone to coordinate care. This system allows Molina Healthcare to maintain an electronic contact record and problem list for each patient that includes information about past calls and any relevant clinical information that CCT members have previously collected. It also includes task lists, automatic reminders, and care plans that can be tailored to specific patient needs to assist CCTs in coordinating patient care.

Molina Healthcare also engages and educates providers about the intervention and the services available to patients. Molina Healthcare's Provider Services department conducts on-site meetings with physicians. Molina Healthcare representatives also answer provider questions on issues such as payment and prior authorization. CCTs also engage providers by telephone when coordinating care for patients; for example, if a patient's blood sugar level is abnormally high, a nurse will alert the doctor's office of the high reading and will help schedule an appointment for that patient.

PROCESS AND OUTCOME MEASURES

DSHS measured claims-based outcomes and self-reported outcomes from surveys of enrollees and disenrollees, and compared results with a group made up of similar patients in other counties to determine if WMIP had an impact. Patient surveys identified reasons for WMIP enrollment or disenrollment and assessed patient satisfaction, using questions taken from the Consumer Assessment of Healthcare Providers and Systems (CAHPS®) survey, making results directly comparable across all three groups.[6] Claims-based outcome measures included physician visits, inpatient admissions, emergency room use, and prescriptions filled. In addition, DSHS reported on the proportion of patients with mental health or substance abuse problems who used mental health and chemical dependency treatment and mental health hospital admissions. DSHS staff reported that these last outcome measures were the most challenging to report as they had to collect data from three different reporting systems and experienced some delays in reporting from Molina. (Despite these challenges, the data were available as of the last reporting period under the MVP grant.)

DSHS reported claims-based measures for the intervention period and one-year pre-intervention period. Because all clients in Snohomish County were eligible for the intervention, DSHS selected a comparison group from other counties by matching patient characteristics (such as medical eligibility criteria, demographics, and utilization of medical and mental health

[6] DSHS has also shared disenrollee survey results with Molina Healthcare to assist it in patient outreach.

services) with a propensity scoring algorithm using data from the year prior to the intervention.[7] This approach is limited by how well propensity scoring identifies a comparison group that matches the intervention group. However, the approach is also much more robust than simply choosing a comparison group without matching patients' characteristics systematically.

Outcomes measures reported to CHCS in April 2007 suggest that WMIP appears to have slowed the rate of inpatient admissions and mental health hospital days (Table 1). However, other measures were either flat or counter to expectation. DSHS did not produce statistical tests of significance for any of its reported measures as staff felt that these measures were more valuable for monitoring than making early determination of potential impacts.

DSHS reported outcomes for 1,427 Medicaid-only ABD patients and 15,301 comparison group patients.[8] Though it is not possible to tell from its final monitoring report, early DSHS reports indicated that WMIP enrollees had lower monthly medical expenditures, on average, at baseline than disenrollees (about $600 for enrollees and $950 for disenrollees as reported in September 2006).[9] This disparity in the type of Medicaid patients who chose to participate in the program might limit program findings somewhat as it would not be entirely clear if the intervention was beneficial for the highest-cost ABD beneficiaries.

Compared to the baseline period, inpatient admissions (per 1,000 member months) rose by 8.7 percent (from 13.8 to 15.0) in the intervention group (over the first 18 months of the program). However, admissions grew by 24.6 percent in the comparison group (from 13.8 to 17.2), nearly three times as fast. Slow growth in overall hospitalizations was also reflected in the rate of mental health hospital days which rose 46 percent in the intervention group (from October 2005 to September 2006) but more than doubled in the comparison group over the same period of time.

At the same time that WMIP enrollees appear to have favorable outcomes for these long-term measures, there was less evidence for some short-term measures. For example, the number

[7] The comparison counties include King, Pierce, Whatcom, Skagit, Kitsap, Thurston, and Clark. To select a group that matched the intervention population, DSHS (1) identified clients in comparison counties who met intervention eligibility criteria; (2) measured baseline demographic and medical characteristics; (3) estimated a logistic regression, using measurable characteristics, for the pooled WMIP and comparison group samples to estimate the probability (the "propensity score") of enrolling in WMIP; and (4) stratified propensity scores into quintiles, randomly sampling comparison group members from each quintile to match WMIP enrollees. Reported outcomes data indicate that the intervention and comparison groups had similar baseline outcome measures, suggesting the groups were well-matched. A more detailed description of the comparison group selection process appears in the technical notes of a presentation made to the Snohomish County Community Advisory Committee on September 14, 2006 by DSHS.

[8] DSHS did not impose strict continuous enrollment criteria on the study sample used to examine outcome measures. The vast majority of clients were continuously enrolled through the first 12 months of WMIP, but by September 2006, 22 percent were disenrolled. The 1,427 clients in the study sample represent Medicaid-only clients who were enrolled in WMIP in December 2005. Comparison group patients were chosen based on a propensity score model that first estimated the likelihood of being a program enrollee (based on observable characteristics) and then matched actual enrollees with comparison group members based on each client's estimated likelihood.

[9] See the WMIP September 2006 Monitoring Report.

TABLE 1

CLAIMS-BASED OUTCOME MEASURES BEFORE AND AFTER IMPLEMENTATION
FOR INTERVENTION AND COMPARISON GROUP PATIENTS
(Per 1,000 Member Months, Unless Otherwise Noted)

	WMIP Enrollees				Comparison Group			
	Sample Size	Pre-Intervention	Intervention	Percent Difference	Sample Size	Pre-Intervention	Intervention	Percent Difference
Inpatient hospital admissions	1,427	13.8	15.0	8.7%	15,301	13.8	17.2	24.6%
Outpatient emergency room visits	1,427	127.8	127.0	–0.6%	15,301	113.8	114.7	0.8%
Physician visits	1,427	1,084	1,069	–1.4%	15,301	1,047	1,108	5.8%
Prescriptions filled	1,427	3,420	3,643	6.5%	15,301	3,346	3,731	11.5%
Mental health prescriptions filled	1,427	637	680	6.8%	15,301	604	635	5.1%
Mental health hospital days	1,427	13.8	20.2	46.4%	15,301	20.4	41.9	105.4%
Percent of patients with AOD needs who received treatment	322	13.0	15.8	21.5%	3,333	14.4	18.9	31.3%

Source: WMIP MVP Data Briefing, April 15, 2007 and MVP workbook.

Note: The pre-intervention period was calendar year 2004 for all measures except for mental health hospital days for which October 2004 through September 2005 was the pre-intervention period. The intervention period for all members but mental health hospital days was January 2005 through June 2006; for mental health hospital days it was October 2005 to September 2006. Comparison group members were enrolled in fee-for-service Medicaid in King, Pierce, Whatcom, Skagit, Kitsap, Thurston, and Clark counties. WMIP enrollees include all Medicaid-only members enrolled in the intervention in December 2005.

AOD = Alcohol and Other Drug.

of physician visits per 1,000 members fell 1.4 percent in the intervention group compared with an increase of 5.8 percent in the comparison group (this difference might not be statistically significant). One of the primary hypotheses of the WMIP was that care coordination might increase the rate of physician visits, improving clients' access to primary care services. It is possible that clients substituted care coordination services for physician visits, particularly if there was no immediate need to visit a physician or that, because of care coordination, patients required fewer overall office visits.

Results for mental health/substance abuse services utilization outcomes were also mixed. Mental health prescriptions filled rose slightly more in the intervention group than the comparison group (6.8 percent versus 5.1 percent), suggesting that intervention group members were receiving prescriptions required to manage their behavioral issues, but at only a slightly better rate than the comparison group. Less encouraging, the proportion of patients with identified needs for alcohol or other drug treatment services who received these services rose at a slower rate in the intervention group compared with the comparison group (21.5 percent versus 31.3 percent), but the difference may not be significant. However, Molina staff reported that WMIP enrollees likely underreported substance abuse/chemical dependency issues, making it challenging to provide services to patients who did not report a need for them. Staff noted that clients were much more willing to talk about mental health issues than substance abuse issues with clinical staff.

Survey results indicated that WMIP improved client satisfaction with some aspects of care delivery (and reduced it for others) compared with a comparison group, and improved care coordination for many intervention group members. DSHS began fielding the patient survey to intervention and comparison group patients in early 2006 to examine satisfaction with health care under either WMIP or fee-for-service Medicaid.[10] Among intervention group clients, when asked if their care was better coordinated since joining WMIP, 40 percent responded that coordination was better compared with 7 percent who reported it had gotten worse. WMIP enrollees reported improved satisfaction with some aspects of care delivery, including wait times for routine care appointments (WMIP enrollees were less likely than fee-for-service clients to have to wait 15 days or more), delays while waiting for health care approval, and problems with customer service or paperwork. However, WMIP enrollees were also less satisfied with other aspects of care than their fee-for-service counterparts. Those areas included getting (1) help when calling health care providers during regular office hours, (2) help for urgent care right away, (3) needed treatment or counseling for a personal or family problem, and (4) prescription drugs (consistent with reports from Molina nurses about prior authorization issues). WMIP enrollees who responded to the survey also rated their health care and health plan lower than fee-for-service clients, on average.

[10] Survey samples included clients enrolled in WMIP or traditional fee-for-service Medicaid as of December 2005. More than 80 percent of surveys for both groups were completed by mail with the remainder completed by phone. A total of 362 WMIP enrollees and 469 traditional fee-for-service clients completed surveys from January 2006 to July 2006.

INTERVENTION CHALLENGES

DSHS and Molina Healthcare experienced a number of challenges in implementing WMIP. There were concerns both internally and externally over continuity of patient care and duplication of services once patients were auto-enrolled in the program. In addition, uncertainty about how the program would be implemented led to resistance by some stakeholders in Snohomish County.[11] DSHS passed a budget provision that allowed it to choose an area of the state to implement WMIP and Snohomish was selected because of the prevalence of high-cost ABD clients. In addition, some DSHS officials were concerned about awarding WMIP to a for-profit health maintenance organization. To address this, DSHS staff discussed the benefits of WMIP and why it was appropriate to pursue the intervention with a managed care model. Quality provisions were included in Molina Healthcare's contract to assure proper monitoring of the intervention. The cost of the evaluation was another area of concern; however, it was necessary to assess whether or not the pilot was successful in permanently reducing patients' use of unnecessary services and medical costs.

Patient engagement also was a challenge since the onset of the intervention, which is not unusual for a program like WMIP, where patients are auto-enrolled. Of the more than 5,000 members enrolled in December 2004, nearly 2,000 chose to disenroll within the first month of the intervention. In addition, enrollment steadily fell to 2,180 active participants by June 2005 and 1,700 by March 2006, as patients lost Medicaid eligibility or moved out of the county. After identifying additional eligible patients in early 2006, enrollment rose to nearly 2,700 in June 2006, and remained steady through April 2007. DSHS staff members reported that the primary reason for stabilization in enrollment was the addition of a staff member who manually searches for new or reconnected clients to be auto-enrolled into WMIP, a task that their data system was unable to accomplish automatically.

To gain insight on the enrollment issue, WMIP conducted a disenrollee survey (in spring 2006). The results show that more than half of disenrollees either lost Medicaid eligibility or moved from Snohomish County, while 37 percent opted out voluntarily. The primary reasons patients opted out of WMIP included problems with access to providers and prescription drugs.[12] Among patients who opted out, 36 percent reported that their regular doctor was not with Molina Healthcare, 24 percent reported they had to travel farther to visit their Molina Healthcare physician, and 18 percent reported issues with the language spoken by their physician.[13] Additionally, 30 percent reported that a family member or a case worker influenced their decision to leave.

[11] The Snohomish county executive who was in place before WMIP implementation was reportedly interested in the program, but his successor was not interested.

[12] Molina staff have noted that its drug formulary is more restrictive than the state's but that CCTs work with clients and their physicians as much as possible to resolve prior authorization issues that arise to provide clients with all the drugs they need in as timely a manner as possible.

[13] Staff reported that WMIP members might have an issue with language when their providers are of different ethnic backgrounds or have accents.

DSHS and Molina also encountered hurdles in the implementation of the long-term care component. The Home and Community Services division sub-contracts long-term care with Area Agencies on Aging to manage long-term care facilities; these facilities were not familiar with managed care contracting processes, such as credentialing or billing practices. Individual providers who provide many of the in-home services were also not familiar with managed care. Working directly with Home and Community Services, Molina Healthcare and the Area Agencies on Aging resolved many of the concerns of the affected parties. In addition, DSHS has found that the data systems for determining payments for long-term care patients cannot easily account or be automated for patients who enroll in WMIP. Because the data systems are cumbersome and the number of eligible long-term care patients is small, DSHS decided to have these patients opt into the program rather than auto-enroll them.

Molina staff reported that long-term care patients were the most challenging clients for whom to coordinate care due to the uniqueness of each client case. Molina supervisors also noted that the complexity of long-term care patient cases added considerable strain to CCT caseloads and resources; coordination of care for one long-term care patient could take up to a entire day of a nurse's time. Molina also found it difficult to find independent and residential providers who meet its requirements (which Molina staff reported are more stringent than DSHS standards). Staff also noted that long-term care eligibility or number of hours determinations from DSHS takes as much as 30 days, resulting in delays in services available to patients with long-term care needs.

CONCLUSIONS

The WMIP intervention was one of the more developed ones in MVP and its project team was well prepared to provide quantitative measures of the intervention's progress. It was particularly advantageous for this intervention that WMIP began in 2005, and that planning for it began well before then. Outcomes reported in April 2007 suggest that WMIP had some success at slowing the rate of growth in hospital admissions and the number of hospital mental health days; however, DSHS has yet to conduct a cost analysis of WMIP (though one is planned). Moreover, according to the survey conducted by DSHS, among patients enrolled in WMIP, a considerable portion believes that their care is better coordinated under Molina than under the traditional fee-for-service arrangement.

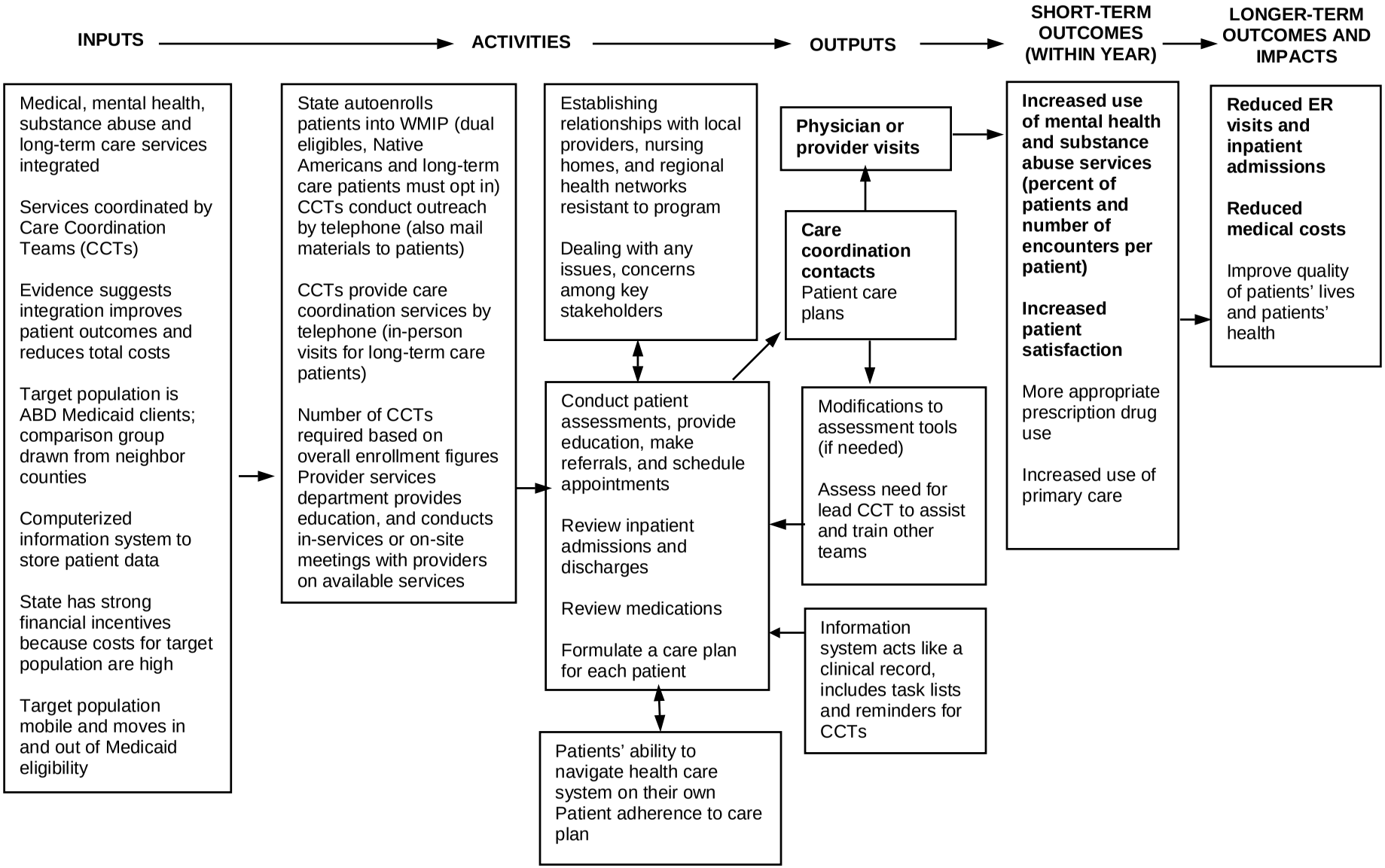
In addition to learning about impacts on patient outcomes, WMIP also provided extensive qualitative information on care coordination program implementation for ABD Medicaid clients. In particular, open-ended responses to the DSHS disenrollee survey and Molina Healthcare's efforts to reach out to auto-enrolled members have helped DSHS and Molina determine the barriers others are likely to face when implementing an intervention like WMIP. The intervention has also provided valuable information on the needs of the target population and lessons on how to best manage those needs. In fact, Molina Healthcare has reported that it has already been able to apply some of these lessons to its Medicare SNP in Washington and similar programs in Texas and Ohio, in terms of proper staffing requirements and patient needs for pharmacy and disease management. An additional lesson learned by staff was that patients with substance abuse issues were not very likely to report those issues to care coordinators, even though they were highly likely to talk freely about their mental health.

WMIP patient enrollment trends have implications for the generalization of program impacts. Though enrollment stabilized near the end of MVP, DSHS reports indicated that enrollees had lower monthly medical expenditures, on average, at baseline than disenrollees. This discrepancy suggests that the WMIP population may not be representative of all ABD patients in the state. Consequently, any observed impacts of the intervention might also not allow generalizing to a higher-cost population.

Despite these challenges, the intervention itself (integrating health care through care coordination) is likely replicable in other Washington counties, now that Molina Healthcare has experience with managing care for this client base. In fact, the Washington State legislature approved an expansion of WMIP into Eastern Washington (likely Spokane) with funding for up to 13,000 total patients, indicating that the intervention is sustainable for at least the near future. Both Molina and DSHS staff have thought about how they would implement a new program from the beginning. In particular, staff from both organizations acknowledge that rolling out all three components of WMIP might have been a better strategy than phasing them in one at a time and, possibly, excluding the long-term component from the program. Staff noted that the physical and mental health/substance abuse components could begin simultaneously. This would be especially advantageous, since many ABD clients have mental health and chemical dependency needs. Staff also noted that it would be important to have strong community buy-in before implementing the intervention elsewhere to avoid the problems WMIP encountered in Snohomish County. Lastly, staff have identified other outcome measures that would be particularly interesting, and appropriate, to examine in the future, including mortality, arrests, HEDIS-like quality of care measures, and falls (of particular importance for long-term care patients).

FIGURE 1

LOGIC MODEL FOR WASHINGTON STATE'S WMIP INTERVENTION



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