

**Evaluating Effectiveness of the Minnesota Medication
Therapy Management Care Program**

FINAL REPORT

Submitted December 14, 2007

**Brian J. Isetts, PhD, BCPS, Principal Investigator
Associate Professor, University of Minnesota College of Pharmacy**

State Contract Number: *B00749*

Evaluating Effectiveness of the Minnesota Medication Therapy Management Care Program

FINAL REPORT

Table of Contents

| <u>Subject:</u> | <u>Page:</u> |
|---|--------------|
| Executive Summary | 4 |
| A. Summary of Findings | 5 |
| B. Conclusions and Recommendations | 6 |
| I. Introduction | 7 |
| A. Program Authorization | 7 |
| B. Project Personnel, Disclosures & IRB Oversight | 8 |
| C. Definition of Acronyms | 8 |
| II. Methods | 9 |
| A. Goals and Objectives | 9 |
| 1. Evaluation Goal | 9 |
| 2. Evaluation Objectives | 9 |
| B. Research Analysis Parameters | 9 |
| 1. Clinical Care Analysis | 9 |
| a. Drug therapy problem analysis | 10 |
| b. Goals of therapy analysis | 12 |
| c. Performance-based standards of care | 12 |
| i. QCare diabetes benchmarks | 14 |
| ii. QCare coronary heart disease | 14 |
| 2. Economic Analysis | 15 |
| a. Claims analysis evaluation | 15 |
| b. Quality of care economic evaluation | 15 |
| 3. Program Implementation Analysis | 16 |
| a. Documentation analysis | 16 |
| b. Relationship to RBRVS grid | 16 |
| c. Provider focus group analysis | 17 |
| d. Prospective recipient identification | 17 |
| 4. Program Improvement Analysis | 18 |
| III. Results | 18 |
| A. Overview of Recipients Receiving MTMS | 18 |
| B. Clinical Outcomes Evaluation | 19 |
| 1. Drug therapy problem analysis | 19 |
| 2. Goals of therapy analysis | 21 |
| 3. Performance-based care analysis | 21 |
| a. QCare diabetes benchmarks | 21 |

| | |
|---|----|
| b. QCare coronary heart disease | 21 |
| C. Economic Outcomes Evaluation | 22 |
| 1. Claims analysis evaluation | 22 |
| 2. Quality of care economic evaluation | 23 |
| D. Program Implementation Analysis | 24 |
| 1. Documentation analysis | 24 |
| 2. MTMS - RBRVS analysis | 25 |
| 3. Prospective recipient identification | 25 |
| E. Program Improvement Analysis | 26 |
| IV. Recommendations | 28 |
| V. Conclusions | 29 |
| VI. References | 33 |

Appendices

| |
|---|
| Appendix A: MTM Care Program Statutory Language |
| Appendix B: QCare Diabetes Chart Abstraction Instrument |
| Appendix C: QCare Coronary Heart Disease Abstraction Instrument |
| Appendix D: Provider Documentation Self-Assessment Instrument |
| Appendix E: Documentation Chart Abstraction Instrument |
| Appendix F: 2008 MTMS CPT Codes |
| Appendix G: Provider Pre-Focus Group Survey Instrument |
| Appendix H: Minnesota Department of Health - QCare Cost Savings Estimates |
| Appendix I: Fiscal Note Submitted with the MTM Care Legislation |
| Appendix J: Cost Savings Estimates for MTMS Recipients with Diabetes |

Figures

| |
|--|
| Figure 1: Study Flow Diagram |
| Figure 2: Drug Therapy Problem Analysis Flow Diagram |
| Figure 3: MTMS Recipient Demographic Characteristics |
| Figure 4: Change in Health Expenditures Before and After MTMS |
| Figure 5: MTMS RBRVS Claims Reviewed by Chart Abstraction |
| Figure 6: Time Spent with MTMS Recipients by Chart Abstraction |

Tables

| |
|--|
| Table 1: Resource-based Relative Value Scale Compensation Grid |
| Table 2: Top 20 ICD-9-CM Codes Listed on Recipients' Initial MTMS Claims |
| Table 3: Productivity Profile of MTMS Providers |
| Table 4: Drug Therapy Problems Reviewed by Chart Abstraction |
| Table 5: Medications and Indications Associated with Unnecessary Therapies |
| Table 6: Indications Associated with Drug Therapy Problems |
| Table 7: Quality of Care Chart Abstraction Results |
| Table 8: Change in Health Expenditures Before and After MTMS |
| Table 9: MTMS Provider Self-assessment Responses |
| Table 10: Documentation Analysis by Chart Abstraction |

EXECUTIVE SUMMARY

Genesis of the Minnesota Medication Therapy Management Care Law can be traced to legislator visits in 1993 to pharmacies implementing new practices in the Minnesota Pharmaceutical Care Demonstration Project. Bills introduced in five legislative sessions over 12 years culminated in the enactment of Minnesota Statute §256B.0625, subd. 13h., 2005. Data pertaining to favorable clinical, economic and humanistic outcomes, as well as experiences of other Medicaid programs in states such as Missouri, North Carolina, Ohio, Florida and Iowa were used to support this legislative initiative. Hallmarks of the Minnesota Law include defining the medication therapy management component of pharmaceutical care services, recognition of qualified pharmacists as providers, authorization for program evaluation, and initial stewardship of program implementation entrusted to collegial relationships among the Department of Human Services (DHS), pharmacist providers, professional associations, and academia (through the DHS Medication Therapy Management Advisory Committee).

The primary goal of this analysis was the development of measurement parameters to be utilized in evaluating program improvements and enhancements, and to support the program's continued application. The analytical study period for this evaluation was April 1, 2006 to March 31, 2007 (the first year of the program). During the first year of the MTM Care Program 34 pharmacists provided medication therapy management services (MTMS) to 259 recipients. The 259 recipients had a total of 431 MTMS encounters and pharmacists were paid \$39,866 for the delivery of these services. The age range of recipients receiving MTMS was 12 to 91 years (median age 52) with 97% (250/259) of recipients under the age of 65.

The four attributes of outcomes data included in this analysis were: clinical, economic, program implementation, and program improvement. Clinical outcomes analysis included evaluating drug therapy problems identified and resolved, goals of therapy achieved, and performance-based benchmark standards achieved for recipients with diabetes and coronary heart disease. Economic outcomes analysis included comparing total health care expenditures for recipients before and after receiving MTMS, and measuring the value-based purchasing impact of recipients meeting performance-based benchmark standards. Program implementation and program improvement were evaluated using medical records chart abstraction review, self-assessment surveys, and focus group interviews and meetings.

Pharmacists in this one-year evaluation identified and resolved 789 drug therapy problems in 259 recipients (3.1 drug therapy problems per recipient). Inadequate therapy (e.g. dose too low for effectiveness, needs additional preventive therapy, and noncompliance) represented 73% of resolved drug therapy problems. Based on the number of drug therapy problems resolved, the number of drugs (14 drugs/recipient), and the number of medical indications (6 indications/recipient) demonstrates that State of Minnesota medical assistance and general assistance medical care recipients with complex medical and drug-related needs were served in the first year of the program.

Clinical outcomes achieved in this program were positive as demonstrated by improvements in goals of therapy achieved as well as drug therapy problems resolved. In addition, quality of care performance benchmarks (QCare standards) achieved in recipients with diabetes was higher than the State average.

Medical records chart abstraction used to evaluate the achievement of performance-based benchmark standards indicated that 36% (41/114) of MTMS recipients with diabetes achieved optimal care (e.g. met all performance criteria) using State of Minnesota 2006 QCare (Quality Care and Rewarding Excellence) benchmark standards. Improvements in QCare standards could be indicative of the positive impact of pharmacists' MTMS on quality of care and health care effectiveness. When drug therapy problems were resolved patients achieved desired goals of therapy. It was noted that 77% (88/114) of recipients with diabetes achieved the QCare 2006 glycosylated hemoglobin A₁C benchmark goal as the hemoglobin A₁C goal is considered by many experts to be a gold standard for glycemic control in patients with diabetes.

Analysis of the value-based purchasing impact of MTMS focused on care delivered to recipients with diabetes. The Minnesota Department of Health (MDH) estimates for statewide annual savings from QCare standards for diabetes care were used in this analysis. The MDH estimates include an annual cost savings amount of \$403.30 per patient for individuals in Minnesota over the age of 18 achieving the "optimal care" benchmark for diabetes. Among the 114 MTMS recipients with diabetes, 36% (41/114) of these recipients achieved all optimal care benchmark standards. It is noted that the statewide average for achieving all diabetes performance benchmarks is 6% although comparisons between these medical assistance MTMS recipients and diabetes patients statewide are difficult to make based upon results of this analysis. Even though a cause-and-effect relationship can not be firmly established in this analysis, potential annual cost savings among the 41 MTMS recipients with diabetes achieving optimal care would be \$15,325.

The value-based purchasing appeal of MTMS to employers and payers relates to competing on results and improving quality in healthcare by achieving evidence-based goals of therapy. By achieving desired goals of therapy while decreasing drug-related morbidity and mortality, the provision of MTMS has favorable value-based purchasing implications. Integrating MTMS provided by pharmacists into the State's health care delivery system may be a viable means for achieving the 2010 QCare Standards.

Economic evaluation was performed for fee-for-service recipients with at least 6-months pre-, and 6-months post-intervention continuous coverage health care claims available at the time of this analysis (n=77). Claims data for MTMS recipients enrolled in pre-paid health plans were either incomplete or unavailable for this analysis. There was a slight increase in total health expenditures from pre-, to post-MTMS intervention with prescription drugs accounting for 24% of the increase. This finding further supports the contributions to improved quality and effectiveness of care provided by pharmacists when resolving drug therapy problems related to inadequate therapy and the need for preventive therapy.

Continuous quality improvement analysis indicates that the State of Minnesota effectively implemented the MTM Care Program by developing tools, procedures and communications processes that were not previously available in other State Medicaid programs. Work of the DHS MTMS Advisory Committee prior to program implementation was very important to successful implementation. Pharmacists participating in the program effectively screened recipients to comply with statutory recipient enrollment qualifications. Processes of care used by pharmacists indicate that recipients' received comprehensive assessments of their drug-related needs and extensive attempts were devoted to conducting follow-up evaluations.

The ten most productive pharmacists in the first year of the MTMS program were those with established collaborative practice relationships with physicians and other primary care providers and were also part of an integrated health delivery system. This finding is consistent with health care delivery improvements advanced in the chronic care model and the medical home model concepts. Pharmacists appropriately identified recipients qualifying for MTMS coverage, although there was a high rate of appointment non-adherence and difficulty maintaining follow-up contact with recipients. Increasing physician awareness of the availability of MTMS may be important for encouraging recipient utilization of the MTMS benefit. It was also suggested that recipients' physicians, case managers and social workers be contacted to assist in coordinating care and resolving recipient transportation problems.

The program implementation and program improvement analyses were conducted by using a continuous quality improvement framework. A number of tools and procedures were used to implement the program including provider enrollment, on-line billing, and provider communications. Cooperation in program implementation among the state professional association, academia, private industry and the State of Minnesota were essential to successful program implementation.

Analysis of pharmacists' documentation in comparison to statutory and regulatory requirements indicated that there was greater than 90% compliance with 11 of 14 essential documentation elements. Medical records chart review of 48% (126 of 259) of recipient records demonstrated that MTMS providers adhered to the resource-based relative value scale (RBRVS) billing criteria with approximately one-third of claims being conservatively billed or potentially under-billed.

The provision of MTMS improves patient care and positively affects quality of care. Although the time frame for economic analysis was limited, the potential impact of MTMS on health expenditures due to improvements in QCare quality standards is noteworthy. The results of this analysis indicated that the State of Minnesota MTM Care Program was effectively implemented and that providers cared for recipients with complex medical and drug-related needs.

INTRODUCTION

The term pharmaceutical care was first described in 1975 as the care that a given patient requires and receives which assures safe and rational drug use.^{1,2} Medication therapy management represents the delivery of pharmaceutical care services in which a practitioner takes responsibility for all of a patient's drug-related needs and is held accountable for this commitment. Medication therapy management has been described as an evolving patient care service in which drug therapy decisions are coordinated collaboratively by physicians, pharmacists, and other health professionals together with the patient.^{3,4} The need for medication therapy management services (MTMS) is demonstrated by the magnitude of drug-related morbidity and mortality which has continued to rise from \$76 billion in 1995 to approximately \$200 billion today.^{5,6}

MTMS has been described in the American Medical Association's *Current Procedural Terminology* (CPT[®]) as "face-to-face assessment and intervention by a pharmacist to optimize the response to medications or to manage treatment-related medication interactions or complications."^{7,8} The care process includes conducting a comprehensive assessment to identify drug therapy problems, developing a care plan to achieve patient-specific goals of therapy, and follow-up evaluation to resolve drug therapy problems and to confirm achievement of goals of therapy.^{3,8,9,10,11} When structured so that patients, pharmacists, physicians and other care-givers work towards achieving drug therapy treatment goals while avoiding or minimizing undesirable medication effects, MTMS can improve clinical outcomes,¹¹⁻¹⁵ improve patient medication adherence,^{11,16} enhance medication safety,¹⁶⁻²¹ and reduce health expenditures.²²⁻²⁶

The Minnesota legislature authorized coverage of MTMS provided by pharmacists for medical assistance and general assistance medical care recipients in 2005 (Minnesota § 256B.0625, subd. 13h., 2005) (*See Appendix A*). Medication therapy management is defined in statute as the provision of pharmaceutical care services by a licensed pharmacist to optimize therapeutic outcomes of the patient's medications. Coverage of MTMS is provided for medical assistance recipients taking four or more prescriptions to treat or prevent two or more chronic medical conditions, or when prior authorized by the commissioner for a recipient with a drug therapy problem that is identified and has resulted, or is likely to result, in significant non-drug program costs.

The 2005 Minnesota Medication Therapy Management Care legislation authorized the commissioner to convene an 11-member Medication Therapy Management Advisory Committee to advise on the implementation and administration of MTMS. The Advisory Committee met on five occasions to establish pharmacist enrollment procedures, place of service specifications, documentation standards, and a resource-based relative value scale (RBRVS) compensation system. The RBRVS compensation system (similar to that used by physicians and other primary care providers under Medicare) is a payment system that is based on complexity of care for a given patient. In the case of MTMS, the complexity of care pertaining to drug-related needs is defined by the recipient's number of medical indications, number of medications, and

number of drug therapy problems. On April 1, 2006 the Minnesota Medicaid MTMS program began enrolling pharmacist MTMS providers who would then identify eligible recipients, deliver and document MTMS, and bill the State for the appropriate level of services delivered.

The MTMS legislation also directed the commissioner to evaluate the effect of medication therapy management on quality of care, patient outcomes, and program costs, and to include a description of any savings generated in the medical assistance and general assistance medical care programs that can be attributable to this coverage. The law enabled the commissioner to contract with a vendor, or an academic institution that has expertise in evaluating health care outcomes, to complete the evaluation. Pursuant to a Request for Proposal issued by the Minnesota Department of Human Services, the University of Minnesota received notification of intent to enter into negotiations and the program evaluation contract was signed on May 10, 2007.

Project Personnel, Disclosure and IRB Oversight

Personnel leading this evaluation project were Brian J. Isetts, B.S., Ph.D., BCPS, FAPhA (Principal Investigator) and Stephen W. Schondelmeyer, Pharm.D., M.A.Pub.Adm., Ph.D., FAPhA (Co-Investigator). Dr. Brian Isetts directed the overall project and the day-to-day research and evaluation activities. Dr. Schondelmeyer provided oversight of the design and implementation of the economic analysis. Two Graduate Research Assistants (Tabitha Leighton and Shriram Parashuram) worked on the data management and the economic analysis. An advanced-standing Pharmacy Doctorate student (Jenifer Morgan) assisted in conducting chart abstractions, organizing focus group meetings and completing other project tasks. There are no financial interests to disclose among any personnel working on this contract in relationship to any of the products, services or business entities evaluated in this analysis. This project was approved by the University of Minnesota's Research Subjects' Protection Program Office at the University of Minnesota (IRB Study Number 0706E10744).

Definition of Acronyms in this Report

AMA - American Medical Association
CHD - Coronary Heart Disease
CPT - Current Procedural Terminology
CQI - Continuous Quality Improvement
DHS – Minnesota Department of Human Services
FFS - Fee for Service
HEDIS - Healthcare Effectiveness Data and Information Set
ICSI - Institute for Clinical Systems Improvement
LDL – Low-density Lipoprotein Cholesterol
MDH – Minnesota Department of Health
MTMS - Medication Therapy Management Services
PPHP - Pre-Paid Health Plan
QCare - Quality Care and Rewarding Excellence
RBRVS - Resource-based Relative Value Scale

METHODS

GOALS AND OBJECTIVES

The goals and objectives of this evaluation project are stated below. The project goals and objectives were established cooperatively between the State of Minnesota Department of Human Services and the evaluation researchers at the University of Minnesota.

Evaluation Goal

The primary goal of this project was to evaluate the Medication Therapy Management Care Program implemented by the Minnesota Department of Human Services. This evaluation has examined the first year of the MTM Care Program from April 1, 2006 to March 31, 2007. Accomplishment of the primary goal required development of measurement parameters to evaluate the program, as well as methods to capture possible program enhancements that could improve the program in terms of quality, processes, and health care costs.

Evaluation Objectives

Specific objectives, or evaluation questions, addressed by this project were: (1) Does the provision of medication therapy management services (MTMS) by pharmacists improve patient care? (2) Does the provision of MTMS by pharmacists affect quality of care? (3) Does MTMS provided by pharmacists have an impact on health expenditures? (4) What program improvements and enhancements would support the MTMS program's continued application?

Research Analysis Parameters

The parameters assessed as part of this evaluation project included measures of the following: (1) clinical care analysis parameters, (2) economic evaluation parameters, (3) program implementation analysis, and (4) program improvement analysis. The study flow diagram is presented in Figure 1, and each research analysis parameter is described in this section.

Clinical Care Analysis Parameters

The clinical care analysis parameters included: (1) drug therapy problems identified and resolved, (2) goals of drug therapy achieved, and (3) achievement of performance-based benchmark standards of care for patients with diabetes and coronary heart disease. These parameters are described further in the following sections.

Drug therapy problem analysis

Drug therapy problems are undesirable events experienced by the patient involving drug therapy that impedes progress toward achieving desired goals of therapy.²⁷ The result of a pharmacotherapy assessment provided during an MTMS encounter is to identify, describe and prioritize drug therapy problems to be resolved through specific interventions within a patient-specific care plan. The number and nature of drug therapy problems identified and resolved by delivery of MTMS to program recipients during the first year of the program were analyzed. Drug therapy problems identified during MTMS were classified using the following drug therapy problem taxonomy (Cipolle, et. al., McGraw-Hill, 2004):²⁷

Drug Therapy Problem Taxonomy

| <u>Drug-related needs</u> | <u>Categories of drug therapy problems</u> |
|---------------------------|---|
| Indication | 1. Unnecessary drug therapy 2. Needs additional drug therapy |
| Effectiveness | 3. Ineffective drug 4. Dosage too low |
| Safety | 5. Adverse drug reaction 6. Dosage too high |
| Compliance | 7. Noncompliance |

In this project, drug therapy problems were studied by compiling the total number of drug therapy problems identified and resolved among all MTMS recipients during the first year of the program, analyzing pharmacists' documentation summary records for those providers utilizing pharmaceutical care documentation software, and conducting chart abstraction of a sample of pharmacists' MTMS records.

The total number of drug therapy problems (for n=259 recipients) equals the number of drug therapy problems verified by chart abstraction (n=126 recipients) added to the number of drug therapy problems represented within the RBRVS classification system for the remaining (n=133 recipients) MTMS claims not reviewed by chart abstraction. The RBRVS compensation system with definitions is presented in Table 1, as well as inserted on the next page for quick reference. The RBRVS compensation system was developed between 1985 and 1992 by the American Medical Association, Harvard School of Public Health and the Health Care Financing Administration in response to Congressional demands for a physician reimbursement system founded on resource costs rather than usual and customary billing.^{28,29} This initiative resulted in the current allocation of resource input costs in the *CPT Manual* for physician work including pre-, intra-, and post-service work, practice expenses, and professional liability insurance.³⁰ It is noted that in the case of services delivered by physicians, physician assistants, nurse

practitioners and some other health professionals, a medical care RBRVS referred to as “Evaluation and Management” codes are used to report, and bill for, those services.⁷

Pharmaceutical Care RBRVS^a – At a Glimpse

| <u>Level^b</u> | <u>Number of Medical Indications</u> | <u>Number of Medications</u> | <u>Number of Drug Therapy Problems</u> |
|--------------------------|--------------------------------------|------------------------------|--|
| Level 1 | At least 1 indication | At least 1 medication | None observed |
| Level 2 | At least 1 indication | At least 2 medications | 1 drug therapy problem |
| Level 3 | At least 2 indications | At least 3-5 medications | 2 drug therapy problems |
| Level 4 | At least 3 indications | At least 6-8 medications | 3 drug therapy problems |
| Level 5 | 4 or more indications | 9 or more medications | 4 or more drug therapy prob. |

^a Summarized from the Minnesota DHS Web Site Program Guide for Delivery of MTMS

^b The level of care reported is the lowest level of patient needs met by all criteria in each level

The RBRVS compensation system has been applied to the delivery of pharmaceutical care services by pharmacists. The current MTMS RBRVS system takes into account the patient’s pharmaceutical care needs and the complexity of care required by a patient.^{27,31} The variables used to describe a patient’s complexity for MTMS include: (1) the number of medical indications that require drug therapy, (2) the number of active medications the patient is taking, and (3) the number of drug therapy problems the patient is experiencing. In the MTMS RBRVS compensation system, the level of care reported corresponds to the lowest level of patient needs met by all 3 criterion within each level.

Medical records chart abstraction is a technique for measuring quality using prospectively-defined care criteria. Medical chart abstraction, or desk review, was used to analyze drug therapy problems by reviewing pharmacists MTMS documentation records using the drug therapy problem taxonomy presented previously. A total of 126 recipient MTMS records were reviewed by chart abstraction. The 126 recipient records also correspond to the set of records used for the performance-based quality of care analysis described later in this section.

Electronic records of MTMS delivered to program recipients were obtained from the pharmaceutical care documentation system in use by the majority of MTMS providers in this analysis (the Assurance™ system). In this analysis, pharmaceutical care summary reports were available for 167 medical assistance and general assistance medical care MTMS recipients. The summary reports from these electronic records were used to determine the number and nature of drug therapy problems identified and resolved in 167 recipients. Figure 2 presents the Drug Therapy Problem analysis flow diagram.

Goals of Therapy Analysis

Goals of therapy are desired endpoints for pharmacotherapy expressed in terms of parameters (signs and symptoms) and laboratory values which are observable, measurable and realistic. The pharmaceutical care process used to provide MTMS includes assessment, care planning, and follow-up evaluation to determine actual outcomes of pharmacotherapy. Therefore, the achievement of goals of therapy can be tracked over time as a result of MTMS. Documentation in the electronic pharmaceutical care record system used by the majority of MTMS providers in the program permits analysis of goals of therapy achieved over the course of recipients' MTMS encounters. In the summary report of 167 recipients' MTMS records (described in the drug therapy problem analysis previously), the achievement of recipients' goals of therapy were analyzed.

Performance-Based Standards of Care

Measuring performance on important dimensions of care and service has been an intense focus of interest in the U.S. healthcare system over the last 15 to 20 years. The National Committee for Quality Assurance (NCQA) was formed in 1990 to build consensus around important health care quality issues by working with large employers, policymakers, doctors, patients and health plans to decide what's important, how to measure it, and how to promote improvement. The Healthcare Effectiveness Data and Information Set, or HEDIS (formerly the Health Plan Employer Data and Information Set) is a tool used by more than 90 percent of America's health plans to measure performance on important dimensions of care and service.

Obtaining value for health spending is important to employers who seek ways to reward providers who achieve quality care benchmark standards. In 2003 the Governor of Minnesota announced the formation of a panel of 18 respected citizen leaders to engage the public in a dialogue about health care costs and to develop recommendations for cost control strategies. Panelists of the Minnesota Citizens Forum on Health Care Costs traveled throughout the State listening to Minnesotans at town hall meetings and informal fireside discussions. The final report reflected a deep-seated desire of many Minnesotans to work together to create a better system of health care.³²

One of seven key recommendations contained in the Minnesota Citizens Forum Report called for reducing costs through better quality by coordinating existing state quality improvement efforts and rewarding better quality and effectiveness. The appeal to employers and payers of competing on results, known as "value-based purchasing," relates to improving quality in healthcare by achieving evidence-based goals of therapy.^{33,34} By achieving desired goals of therapy while decreasing drug-related morbidity and mortality, the provision of MTMS has value-based purchasing implications. The integration of MTMS into healthcare delivery has been cited by the National Business Coalition on Health as a viable means for helping patients achieve their health goals.³⁵

The Minnesota Citizens Forum recommendation of coordinating existing state quality improvement efforts led to development of the Quality Care and Rewarding Excellence (“QCare”) initiative. Organizations in Minnesota, including the Institute for Clinical Systems Improvement (ICSI), have championed the cause of health care quality and accelerated improvements in the value of health care delivered to patients. Collaboration between organizations in Minnesota such as ICSI, and NCQA nationally, has resulted in the development of evidence-based, scientific health care improvement measurements. There are many health quality measurements that are common to both the national HEDIS performance benchmarks and to the State of Minnesota QCare performance benchmarks.

The Minnesota QCare standards of care, introduced in July 2006, represent evidence-based best practice guidelines developed by physicians, state officials, hospital and business representatives, insurers and other health providers pursuant to recommendations of the bi-partisan health forum task force. In addition, the Minnesota Department of Health has estimated that \$153 million in health care costs could be saved if QCare standards are met.³⁶ In this evaluation, QCare measures in place for 2006 pertaining to patients with diabetes and coronary heart disease were applied to the care of recipients receiving MTMS provided by pharmacists.

QCare Analysis

QCare measures used in this project pertain to recipients at least 18 years of age with diabetes or coronary heart disease.³⁷ Institute for Clinical Systems Improvement (ICSI) guidelines have been used to develop the QCare performance measures for patients with diabetes and coronary heart disease. Medical and MTMS records chart abstraction were used to measure quality in this project. Medical records for recipients in the Fairview and Health Partners systems were made available for one month preceding each recipient’s first MTMS encounter through to the date of chart abstraction (June/July 2007) in accordance with the conditions of Research Committee approval. The Fairview and Health Partners health systems were selected for this analysis because Research Committee approval for chart abstraction was granted, and because 83% (214/259) of MTMS recipients received care within these two health systems during the first year of the program.

The chart abstraction instruments used in this analysis are presented in Appendices B and C. When conducting chart abstracts, three measurements were obtained for each criterion, when available, for a period up to one year after recipients’ first MTMS encounter. The number of recipients meeting each of the quality measures is reported including the number of recipients meeting all of the quality care criteria, which is defined as “optimal care.”

The benchmark parameters for diabetes and coronary heart disease in place during 2006 that were used in this evaluation are described below.

Diabetes Benchmark Parameters

Optimal care for patients with diabetes for 2006 according to the Minnesota QCare Project required meeting all five of the following diabetes benchmark standards:

- (1) Hemoglobin A₁C measurement below 8%,
- (2) LDL-cholesterol measurement below 130 mg/dL,
- (3) Blood pressure measurement below 130/85 mm Hg,
- (4) Daily aspirin use if over 41, and
- (5) No tobacco use.

In 2004, 6% of Minnesotans who were diagnosed with diabetes were estimated to have received optimal care for their diabetes based on these QCare benchmarks. The identification of patients with diabetes for QCare chart audits was based on ICD-9-CM Codes for diabetes,^(1a) reported in or obtained from medical and hospital claims data supplied by the State of Minnesota. IRB and other research committee approvals were obtained to conduct chart abstracts in the Fairview and Health Partners health systems. Rather than selecting a sample group, the records of *all* MTMS recipients with diabetes in the Fairview and Health Partners systems as identified by claims data were reviewed in this analysis.

Coronary Heart Disease Benchmark Parameters

Optimal care for patients with coronary heart disease for 2006 according to the Minnesota QCare Project required meeting all five of the following benchmark standards:

- (1) LDL-cholesterol measurement below 100 mg/dL,
- (2) Blood pressure measurement below 140/90 mm Hg for all ages,
- (3) Blood pressure measurement below 130/80 mm Hg for patients with co-morbidity of diabetes,
- (4) One aspirin per day, and
- (5) No tobacco use.

The identification of patients with coronary heart disease for QCare chart audits was based on ICD-9-CM Codes for coronary heart disease,^(2a) reported in or obtained from medical and hospital claims data supplied by the State of Minnesota. IRB and other research committee approvals were obtained to conduct chart abstracts in the Fairview and Health Partners health systems. The records of all MTMS recipients with coronary

^{1a} The ICD-9-CM Codes for Diabetes Mellitus begin with code 250 and exclude: gestational diabetes (648.8), hyperglycemia – not otherwise specified (790.6), neonatal diabetes mellitus (775.1), non-clinical diabetes (790.2), and diabetes complicating pregnancy, childbirth, or the puerperium (648.0).

^{2a} The ICD-9-CM Codes for Coronary Heart Disease include the following: acute myocardial infarction (410), percutaneous transluminal angioplasty (PTCA), and coronary artery bypass graft (CABG) (36), coronary atherosclerosis (414), stable coronary angina (413.9), unstable coronary angina (411.11), and chest pain (non-anginal) (786.5).

heart disease, in the Fairview and Health Partners systems, identified by claims data were reviewed in this analysis.

Economic Analysis

The effects of MTMS on total health expenditures by recipients receiving MTMS were evaluated using claims level data. Total health expenditures per recipient per month were calculated for the covered period before each recipient received MTMS, and the covered period after recipients' first MTMS encounter. Claims were grouped into the following expenditure categories: (1) inpatient hospital services, (2) ambulatory care services, (3) extended & residential care services, (4) home and community-based services, (5) prescribing providers' services, (6) non-prescribing providers' services, (7) lab & diagnostic procedures, (8) prescription claims, (9) MTMS claims, and (10) other claims. For each recipient the dollars expenditure per month for each type of claim was summed for each month when the recipient was eligible for the program.

Recipients who received MTMS were assessed to determine their type of payment (i.e., fee-for-service versus pre-paid health plan) and their eligibility for medical assistance for each month over time in the study period. For purposes of this economic analysis, the month of the first MTMS visit was set as the baseline month (or month 0). All health care claims were obtained for the MTMS recipients for the time period—January 1, 2005 through May 31, 2007. All MTMS recipients were classified to determine the type of health payment for each month in this study time frame and in the one-year baseline period prior to the study period. The number of months of continuous eligibility from the same type of payment plan was determined for the period prior to the first MTMS intervention and for the period after the first MTMS intervention.

Analysis of the value-based purchasing impact of MTMS focused on the performance-based benchmarks achieved in recipients with diabetes. Evidence gathered by the Institute for Clinical Systems Improvement pertaining to the economic impact of improvements in care delivered to patients with diabetes provided the initial literature review for this analysis.³⁸ Estimated statewide annual savings from QCare standards for cardiac care and diabetes care, prepared by the Minnesota Department of Health (MDH), Health Economics Program, were then used to establish the methodology for assigning value to diabetes patients receiving optimal care (Appendix H). The MDH estimates include an annual cost savings amount of \$403.30 per patient for individuals in Minnesota over the age of 18 achieving the “optimal care” benchmark for diabetes.

It is noted that the statewide average for achieving all diabetes performance benchmarks is 6% although comparisons between medical assistance MTMS recipients with diabetes and diabetes patients statewide are difficult to make in this analysis because of uncertain baseline differences between the two groups. Nevertheless, the number of recipients achieving optimal care in the year following each recipient's first MTMS encounter using chart abstraction of medical and MTMS records were recorded. The annual cost savings estimate in this analysis is calculated by multiplying the MDH per

patient optimal care annual cost savings amount (\$403.30) times the number of MTMS recipients achieving optimal care above the state average. Results are reported as a potential cost-saving amount per MTMS recipient for improvements in performance-based benchmark criteria above the statewide average.

Program Implementation Analysis

Documentation analysis

Comparisons of practitioners' MTMS documentation to statutory and regulatory documentation requirements was accomplished by two methods: 1) Practitioner self-assessment and, 2) Desk review records chart abstraction of the 126 recipient records used in the QCare performance benchmark evaluation. Pharmacist self-assessment of regulatory requirements has been used successfully by the Wisconsin Pharmacy Examining Board in lieu of Board Inspector verification of compliance.³⁹ Results from this analysis are reported as a percentage compliance rate with documentation elements contained in the DHS Program Guide. The service definition and documentation specifications used in this analysis have been drawn from the DHS Program Guide, MHCP Provider Update PRX-06-02R (available at: http://www.dhs.state.mn.us/main/idcplg?IdcService=GET_DYNAMIC_CONVERSION&RevisionSelectionMethod=LatestReleased&dDocName=dhs16_136889#P146_6142). The pharmacist documentation self-assessment instrument and the documentation chart abstraction instrument used in this analysis are presented in Appendices D and E. This information was then presented and discussed at MTMS Provider CQI Focus Group meetings held on 9/26/07 and 10/2/07 so that providers could review, clarify, rate and enhance documentation.

Documentation analysis also included an accounting of drug therapy problems identified and resolved, goals of therapy achieved in recipients receiving MTMS, and comparison of MTMS claims to resource-based relative value scale documentation elements (e.g. number of medical indications, number of active medications, and number of drug therapy problems resolved). Desk review chart abstraction of pharmacists' MTMS was performed for the 126 recipient records analyzed in the QCare quality of care performance benchmark evaluation.

Relationship of MTMS Documentation to the RBRVS Reimbursement Grid

Chart abstraction of the 126 recipient records used in the quality of care performance benchmark analysis was also used to analyze the consistency of billing in relationship to the RBRVS billing schematic. The five-level RBRVS reimbursement grid is presented in Table 1.

In the reimbursement grid presented in Table 1 it is important to note that the American Medical Association's CPT Panel recently migrated pharmacists' MTMS CPT codes from Category III status (0115T, 0116T, 0117T) to Category I status (99605,

99606, 99607) to become effective January 1, 2008. The 2008 pharmacist MTMS CPT codes with corresponding descriptions and definitions are presented in Appendix F.⁴⁰

Provider Focus Group Analysis

Individuals invited to participate in the focus group evaluation included the 34 pharmacists identified as providing MTMS in the first year of the program. An important assumption of the MTMS provider CQI focus group evaluation is that program participants have an inherent desire to increase quality and raise standards by continually solving problems and improving processes. The focus group evaluation was designed to create a structure and environment for MTMS providers to accelerate progress toward the goal of solving problems and improving processes. The methodology employed in this aspect of program evaluation consisted of an electronic pre-meeting survey followed by a quality improvement workshop. MTMS providers received a nominal honorarium of \$100 for participation. The pre-meeting survey instrument is presented in Appendix G. Providers were specifically asked to rate, and comment on, all aspects of the State of Minnesota MTMS program. Results of provider ratings were discussed at two focus group meetings (held on 9/26/07 and 10/2/07) convened via ITV technology at five locations throughout Minnesota (Bemidji, Duluth, Minneapolis, Rochester, and St. Cloud). Focus group sessions were recorded and archived by the State of Minnesota Office of Enterprise Technology for review and analysis.

Prospective Recipient Identification

The ability to prospectively identify recipients who would benefit from MTMS is a desirable program characteristic among government and commercial payers. The Medicare Modernization Act describing MTMS in the Medicare Part D Program established eligibility threshold levels in terms of a beneficiary's number of medications, medical conditions, and estimated monthly drug expenditures. Although there is little evidence supporting the positive predictive value of the Medicare Part D MTMS eligibility criteria, it is generally assumed that patients with the most complex drug-related needs may benefit the most from MTMS provided by pharmacists.

In 2005 a panel of pharmacists drafted a vision of core MTMS components in community pharmacy.⁴¹ Although this MTMS core vision report notes that all patients using prescription medications would benefit from the core services, it is suggested that priority be given to complex patients who may benefit most from MTMS. One of the suggestions presented in the report for prospectively identifying priority MTMS recipients includes patients with at least one chronic disease (e.g., diabetes, chronic heart failure, hypertension, hyperlipidemia, asthma, osteoporosis, depression, osteoarthritis, and chronic obstructive pulmonary disease).

The State of Minnesota completed an informal pilot project at two pharmacy sites to prospectively identify non-dual, eligible MTMS recipients. In June of 2006, recipients receiving prescriptions at the Mayo Clinic pharmacies or the Fairview Pharmacy Services pharmacies were identified by the State for the informal pilot project. Case managers at

both sites received a report of Medicaid recipients who were receiving prescriptions at each of their respective sites, including prescription claims and diagnosis codes from ambulatory clinic visits. Suggestions from the case managers combined with utilization review by the State resulted in a list of diseases to be included in the algorithm that would capture chronic diseases characteristic of FFS recipients in need of MTMS.

The State then worked with the contractor ACS-Heritage to devise the final algorithm to be used for prospectively identifying priority MTMS recipients. The final list of ten chronic disease conditions (fourteen diseases) included: chronic heart failure, migraine headaches, hypertension, hyperlipidemia, asthma, osteoporosis, osteoarthritis, chronic obstructive pulmonary disease, diabetes, and mental health (depression, schizophrenia, post-traumatic stress disorder, bipolar disorder, and attention deficit hyperactive disorder). The algorithm was based on the presence of two or more occurrences of the ICD-9-CM codes for the 14 diseases within the previous two years and two or more prescriptions corresponding to the 14 diseases within the previous 135 days. In June 2007 the final algorithm was applied to all Minnesota Medicaid recipients to determine the number of individuals who would be identified using this tool.

In addition, the predictive value of the algorithm was examined in MTMS recipients who had previously received MTMS during the first year of the program. The subgroup of 77 MTMS fee-for-service (FFS) recipients utilized for the economic analysis was employed to determine the percentage of these recipients who would have been identified by the algorithm.

Program Improvement Analysis

The MTMS provider focus group process described above served as the basis for developing the program improvement recommendations and suggestions provided in this analysis. An experienced program facilitator (Ms. Marsha K. Millonig, MBA, RPh, President, Catalyst Enterprises LLC of Eagan) assisted in coordinating discussions among MTMS providers at the 9/26/07 and 10/2/07 focus group meetings. Results of the pre-meeting surveys plus three program case studies were shared with providers to stimulate discussions pertaining to program implementation.

RESULTS

The primary goal of this analysis has been the development of measurement parameters to be utilized in evaluating program improvements and enhancements, and to support the program's continued application. The analytical study period for this evaluation is 4/1/06 to 3/31/07 (first year of the program).

During the one year analytical study period 34 pharmacists provided MTMS to 259 recipients. There were 173 recipients with predominantly fee-for-service (FFS) health coverage, and 86 recipients with pre-paid health plan (PPHP) coverage (31=Medica, 25=UCare, 23=Health Partners, and 7= Blue Cross Blue Shield of Minnesota). Among the 259 recipients there were a total of 431 MTMS encounters with a corresponding expenditure of \$39,866 paid to pharmacists for the delivery of MTMS during the one-year study period (average \$92.50/encounter). The age range of recipients receiving MTMS was 12-91 (median age 52) with 97% (250/259) of recipients under the age of 65. Demographic characteristics as reported by medical claims indicating the age, gender and racial distribution of MTMS recipients are presented in Figure 3.

The four components of outcomes data included in this analysis are: clinical, economic, program implementation and program improvement. Clinical outcomes analysis includes drug therapy problems identified and resolved, goals of therapy achieved, and quality of care performance measured by the achievement of QCare (Quality Care and Rewarding Excellence) standards for recipients with diabetes and coronary heart disease. Economic outcomes analysis includes comparing total health care expenditures for recipients before and after receiving MTMS, and measuring the value-based purchasing impact of recipients meeting the QCare performance benchmark standards. Program implementation and program improvement were evaluated using medical records chart abstraction review, self-assessment surveys, and focus group interviews and meetings.

Clinical Outcomes Evaluation

Drug Therapy Problem Analysis

The identification and resolution of drug therapy problems represents a critical health care contribution because each time a drug therapy problem occurs, goals of therapy are compromised and can not be met. Drug therapy problem analysis was conducted by desk review chart abstraction for the 126 recipient records subject to the quality care (QCare) benchmark performance evaluation described previously. There were 587 drug therapy problems identified and resolved among the 126 recipient records.

For the remaining 133 MTMS recipient records not reviewed by chart abstraction, drug therapy problems were inferred from the RBRVS category of the MTMS claim (*See RBRVS Grid in Table 1*). It is noted that MTMS claims for Level 5 encounters were recorded as having four drug therapy problems. This method of inferring the number of drug therapy problems may under-report the true number because Level 5 MTMS claims include encounters with *four or more* drug therapy problems and in some cases more than four drug therapy problems could have been resolved. Using this methodology, there were 202 drug therapy problems estimated among the 133 MTMS recipient claims not reviewed by chart abstraction.

Therefore, a total of 789 drug therapy problems were identified and resolved among the 259 MTMS recipients (3.1 drug therapy problems per recipient). In a national sample of over 2,985 patients who received pharmaceutical care services between the years 2000 and 2003, pharmacists found and resolved 9,845 drug therapy problems (or 3.3 drug therapy problems per patient over the four-year period).⁴²

The top 20 ICD-9-CM condition codes listed on the 259 recipients' initial MTMS encounter claims are presented in Table 2. It is noted that diabetes represented the most frequently listed condition code on MTMS claims.

There were a total of 34 pharmacists who provided care to recipients during the first year of the program. Table 3 displays the profile of care delivered by each of the 34 pharmacists during the study period. The ten most active MTMS pharmacists, in terms of recipient encounters and drug therapy problems resolved, were collaborating with physicians and other primary care providers within an established integrated health delivery system (the Fairview and Health Partners systems). This finding is consistent with health care delivery improvements advocated in the chronic care model⁴³ (which identifies interrelationships among essential health system elements necessary for productive interactions between proactive practice teams and activated patients), and the medical home model⁴⁴ (in which linking patients to a patient-centered medical home helps eliminate barriers and improve access) concepts.

Table 4 summarizes the categories of drug therapy problems for 126 recipient records reviewed by chart abstraction. Dosage too low, noncompliance, and need for additional drug therapy represented 73% of drug therapy problems resolved by MTMS pharmacists. A subset analysis of medications and conditions associated with the 21 "unnecessary drug" category of drug therapy problems is presented in Table 5 to illustrate the medications and corresponding indications found in the desk review analysis for this category of drug therapy problems.

Desk review chart abstraction was also used to record the indications associated with drug therapy problems. A summary report of drug therapy problems with corresponding medical indications is presented in Table 6. It is noted that diabetes represents the predominant condition in this review. This result would be expected as diabetes was the most frequently listed condition code on MTMS claims (*See* Table 2), as well as one of the medical claims review criteria employed for the quality of care performance-based benchmark analysis.

For MTMS providers who use pharmaceutical care documentation software (e.g. the Assurance™ system) in their practices, an analysis of 167 recipients' pharmaceutical care documentation summary reports indicates that MTMS recipients had an average of 6.3 indications per patient (range = 2 – 12) and were taking 14.1 drugs (prescription plus non-prescription drugs) per patient (range = 4 – 25). The 14.1 drugs per recipient included 10.5 prescription and 3.6 non-prescription medications per recipient.

In the pharmaceutical care documentation software system summary reports of 167 recipients' encounters there were 516 drug therapy problems that were resolved, of which 82% did not require the direct involvement of a physician while 18% of drug therapy problems were resolved through collaboration with a physician or other primary care provider. Among the 18% of drug therapy problems resolved through collaboration, the top three physician-related actions were to: 1) Initiate new therapy, 2) Change the dose of a medication, and 3) Discontinue a medication. In pharmaceutical care practices nationwide it has been reported that 75-80% of interventions to resolve drug therapy problems are agreed upon directly between the patient and the pharmacist, and the remaining 20-25% are resolved either through direct contact with a patient's primary care provider(s) or via pre-approved collaborative practice agreements or protocols.²⁷

Analysis of Goals of Therapy Achieved

For the analysis of goals of therapy achieved, the same 167 recipients' pharmaceutical care summary reports discussed above were reviewed. Among these 167 recipients, goals of therapy achieved improved from 76% to 87% after recipients' MTMS encounters during the first year of the program. This increase in goals of therapy achieved is similar to the rate of increase from 74% to 89% reported in a population of Minnesota pre-paid medical assistance program patients in 2000.³

Quality of Care Performance Benchmark Analysis

Medical records chart abstraction used to evaluate the achievement of QCare performance benchmark standards indicate that 36% (41 of 114) of recipients with diabetes achieved all 2006 performance benchmarks meaning that these recipients were receiving optimal care. Among the 114 MTMS recipients with diabetes the average hemoglobin A₁C value was 7.38% (range = 4.9-14.7%, std. dev. = 1.82%). The 2006 QCare benchmark includes a hemoglobin A₁C value less than or equal to 8%.

Among the 114 MTMS recipients in the QCare analysis 38.3% (31/81) of recipients with diabetes (and no coronary heart disease) achieved all performance criteria. There were 30.3% (10/33) of recipients with diabetes plus coronary heart disease who achieved all performance benchmarks. It is noted that recipients with diabetes plus coronary heart disease were subject to the more aggressive benchmark standard (in terms of lower LDL-cholesterol and blood pressure measurements) in order to achieve optimal care (*See* pages 13 & 14). QCare analysis of recipients with diabetes and recipients with diabetes and coronary heart disease were combined to determine the percentage of recipients with diabetes achieving optimal care (e.g. achieving all performance benchmark criteria). Results of the quality of care performance benchmark chart abstracts are presented in Table 7.

There were a small number of recipients (n=11) with CHD alone, possibly due to the younger age of Medicaid MTMS recipients (mean = 52 years of age) in this analysis relative to patients in the general population with CHD. According to the American Heart

Association, it is noted that the prevalence of CHD increases to 10% in men after the age of 60 and in women after the age of 65.⁴⁵ Therefore, the small number of recipients with CHD alone limits analysis of results from this subgroup of recipients.

Improvements in QCare standards exemplify the contribution of pharmacists' MTMS to quality of care and health care effectiveness. When drug therapy problems are resolved patients achieve desired goals of therapy. Noteworthy in this analysis is that 77% (88/114) of recipients with diabetes achieved the QCare 2006 hemoglobin A₁C benchmark goal. For more than 25 years the hemoglobin A₁C test has been the most widely accepted outcome measure for evaluating glycemic control in individuals with diabetes⁴⁶, and is considered to be the most objective and reliable measure of long-term metabolic control.^{47,48}

Economic Outcomes Evaluation

Claims analysis evaluation

Among the 431 MTMS claims submitted in Year One, 408 MTMS claims were submitted to the State of Minnesota and 23 were submitted to the pre-paid health plans (PPHP) Medica and U Care. MTMS and other health care claims for Health Partners and BlueCross and BlueShield of Minnesota recipients were requested, but could not be supplied, for this analysis. It is noted that the State of Minnesota was responsible for the payment of MTMS claims in 2006 regardless of a recipient's enrollment in a FFS or PPHP program, while starting in 2007 PPHP's were required to be responsible for MTMS claims for PPHP recipients. The initiation of PPHP responsibility for MTMS claims in 2007 increased administrative complexities of the program and led to a number of administrative challenges for MTMS providers.

There were 77 FFS recipients with continuous enrollment for a minimum of 6 months pre-MTMS intervention and 6 months post-MTMS intervention. These 77 of 259 MTMS recipients qualified for the economic analysis based on continuous enrollment over the minimum 6-month pre,- and 6-month post-intervention period. Total health care claims (including payments for MTMS) were \$3,027 per person per month in the pre-intervention period compared to \$3,271 per person per month in the post-intervention period for an 8.0% difference in expenditures. (*See Table 8*).

Total health care services were broken down into ten specific categories including MTMS and prescriptions and the expenditures before and after MTMS. (*See Table 8*). Prescription drugs were the single largest expense for Medicaid recipients receiving MTMS and accounted for nearly one-third (32.7%) of the total health expenditures. Inpatient care followed by home and community based services were the next largest expenditure categories with each accounting for nearly one-fourth of the total expenditures for the Medicaid MTMS recipients.

Each of the expenditure categories was assessed to determine the difference, and the direction of change, before and after intervention with MTMS. (See Figure 4). In addition to MTMS expenditures, four other categories experienced an increase in expenditures after MTMS including: prescriptions (+24.3%), inpatient hospital care and services (+11.2%), home and community based services (+4.9%), and extended and residential care services (+12.7%). Five categories had a decrease in expenditures after MTMS including: prescribing providers (-9.3%), non-prescribing providers (-36.5%), ambulatory care services (-20.6%), other care and services (-24.3%), and lab and diagnostic procedures (-69.7%). The pre-MTMS versus post-MTMS expenditures for each of these categories was compared for the 77 recipients with 6 months of continuous coverage before and after MTMS. None of the expenditure categories showed a statistically significant change in expenditures with a paired t-test. Due to the observational nature of this evaluation project and the small group size (77 recipients), the lack of statistical significance is not unexpected. Continued monitoring of the MTMS program and analysis of results as the number of recipients increases should allow statistical analysis with sufficient power to adequately assess statistical significance.

It is noted that if expenditures for MTMS and prescriptions were to be excluded, total health expenditures dropped 1.0% from \$2,037 to \$2,017 before and after MTMS. (See Table 8). This finding is not surprising, since inadequate therapy (e.g. drug therapy problem categories of dose too low for effectiveness, needs additional drug therapy primarily for prevention, and noncompliance) accounted for 73% (429 of 587) of the drug therapy problems identified and resolved by the MTMS providers as verified through medical records chart abstracts. This correction of inadequate therapy resulted in appropriate treatment of medical conditions with medications, thus increasing the prescription expenditures by \$241 per person per month. This evaluation analysis was limited in its time frame to a 6 month period before and after MTMS. The major effect of MTMS is an expected reduction in inpatient admission and related services, however, this effect is a longer term impact that is expected to take 1 year to 5 years or more to be expressed. Continued monitoring of this Medicaid MTMS program will allow examination to determine the long term impact of MTMS. In the short run, the expenditures for office visits to physicians and other providers decreased as did the expenditures for lab, diagnostic and other ambulatory care services.

The slight increase (\$244 per patient per month) in total health expenditures among FFS recipients in the first year of the program was anticipated in the fiscal note submitted in conjunction with the Minnesota MTM Care Law (See Appendix I). Economic evaluation of recipient claims before and after MTMS could be extended due to the fact that only 77 recipients had continuous coverage for at least 6-months pre-MTMS and 6-months post-MTMS intervention. Also, with time and cooperation of the pre-paid health plans (PPHP) information on more MTMS recipients can be evaluated.

Quality of care economic evaluation

Analysis of the value-based purchasing impact of MTMS focused on care delivered to recipients with diabetes. The Minnesota Department of Health (MDH),

Division of Health Policy, Health Economics Program has established estimated statewide annual savings from QCare standards for diabetes care (*see* Appendix H).

Among the 114 MTMS recipients with diabetes, 36% (41/114) of these recipients achieved all performance benchmark standards. It is noted that the statewide average for achieving all diabetes performance benchmarks is 6% although comparisons between medical assistance MTMS recipients with diabetes and diabetes patients statewide are difficult to make based upon results of this analysis. The MDH estimates include an annual cost savings amount of \$403.30 per patient for individuals in Minnesota over the age of 18 achieving the “optimal care” benchmark for diabetes. There were 41 individuals in this study who achieved optimal care, and if it could be assumed that 6% of these recipients were achieving optimal care previously, then 38 additional MTMS recipients achieved optimal care. The annual cost savings estimate in this analysis could then be calculated by multiplying the MDH per patient cost savings amount times 38 MTMS recipients resulting in a potential annual cost savings of \$15,325 (*see* Appendix J).

The limitations of this analysis are that the number of MTMS recipients with diabetes achieving all QCare benchmarks in the pre-intervention period was unknown, and that this cost savings estimate may not be directly attributable to the care provided by an individual MTMS provider. When MTMS is delivered there is collaboration among all health providers to achieve patients’ goals of therapy, and therefore this cost savings benefit may be due as much to improved systems of care as it is to the effect of an individual MTMS provider. Nevertheless, this potential cost savings estimate provides additional support for the impact of MTMS on improving quality and effectiveness of health care delivery.

Program Implementation Analysis

The program implementation and program improvement analyses were conducted by using a continuous quality improvement framework. A number of tools and procedures were used to implement the program including provider enrollment, on-line billing, and provider communications. MTMS providers found that program implementation was facilitated by use of a DHS Help Desk Phone Line, recipient eligibility verification through the MN-ITS system, and communication of MTMS program requirements on the DHS MHCP Web site.

Documentation analysis

Analysis of documentation elements in comparison to statutory and regulatory requirements indicates that there was greater than 90% compliance with 11 of 14 essential documentation elements. The documentation requirement of linking recipients’ medical conditions to the drugs and dosages being used to treat each condition (60% compliance) represents an area in which pharmacists in this analysis could improve documentation. Results of the MTMS provider documentation self-assessment surveys

are presented in Table 9. Documentation analysis by desk review chart abstraction for 126 recipient records is presented in Table 10.

By comparing the results contained in Tables 9 and 10, it is noted that there is substantial correlation between the provider documentation self-assessment results and the documentation desk review chart abstracts. The documentation requirement of linking all drugs in use with the corresponding indications for use represented the lowest area of documentation compliance. It is noted that MTMS practitioners who used the physician electronic medical record to document MTMS encounters were more likely to fall short of this documentation requirement. In addition, pharmacists who attempted to use the physician electronic medical record for MTMS billing, rather than using a pharmaceutical care documentation system, were more likely to under-report (e.g. under bill) their MTMS services.

Relationship of MTMS Documentation to the RBRVS Reimbursement Grid

To evaluate effectiveness of program implementation, the accuracy of MTMS claims submitted to the State and compliance with documentation requirements were analyzed. Medical records chart review of 48% (126 of 259) of recipient records indicated that about 60% of MTMS claims were submitted at an RBRVS level commensurate with evidence documented in recipients' records, 30% of recipients' records contained documentation that would have supported billing at an RBRVS level higher than that which was billed to the State, and 10% of MTMS claims were submitted at a level that was not fully supported by documentation contained in recipients' medical records. In addition, there were 31 documented MTMS encounters among these 126 recipients that were not submitted to the State for reimbursement.

An analysis of adjusted, or corrected, MTMS RBRVS claims for the 236 claims submitted among 126 recipient records is displayed in Figure 5. Time spent, "face-to-face," with recipients as reported in MTMS documentation was analyzed in conjunction with the desk review chart abstraction of the 236 MTMS claims submitted for the 126 recipient records presented above. Figure 6 presents the distribution of time spent with recipients reported in MTMS records as a function of the submitted RBRVS MTMS claim level.

Prospective Recipient Identification

The State of Minnesota completed an informal pilot project at two pharmacy sites (Mayo Clinic pharmacies and Fairview Pharmacy Services pharmacies) to prospectively identify non-dual, eligible MTMS recipients using a claims-based algorithm. The algorithm was developed to include 14 diseases through suggestions of case managers at the two pilot sites combined with utilization review by the State. The algorithm was then applied to all Medicaid recipients in the State of Minnesota in June 2007 to identify 5,676 priority recipients who could qualify for MTMS.

In addition, the 77 recipients in the 6-month pre-, and 6-month post-intervention economic analysis were reviewed to determine the predictive value of the algorithm among current MTMS recipients. All 77 recipients had continuous fee-for-service medical assistance coverage and had at least one year of medical claims data. In this analysis, 49% (38 of 77) of these MTMS recipients were identified by the algorithm.

Program Improvement Analysis

This section is divided into areas in which the Minnesota Medicaid MTM Care Program is working well (program effectiveness) and areas in which the program can be improved. The results presented below were gathered from 26 MTMS providers who attended either the 9/26/07 or 10/2/07 focus group sessions conducted by interactive television (ITV) throughout the State of Minnesota. ITV bridging was provided by the State of Minnesota Office of Enterprise Technology (OET), Videoconference Reservation Center (VRC), (video.services@state.mn.us, www.oet.state.mn.us).

Program Effectiveness Analysis

Participants generally agreed that recipient identification was not a significant barrier. Three unique ideas for recipient identification were generated during discussions. In one system, pharmacists working in the dispensing area of the community pharmacy are able to refer patients with an online referral form to the pharmacist MTMS providers who follow-up and make patient appointments. The referring pharmacist then receives credit for identifying and referring eligible patients for MTMS. In an integrated clinic, a colored dot system is used on the recipient's health record to notify physicians, nurses and other providers that the recipient is eligible for MTMS. In two other sites, local community pharmacies are collaborating with physician offices to interact periodically with clinic personnel and to access electronic medical records for patients, easing their ability to obtain laboratory results as well as to identify eligible recipients.

Pharmacists participating in the program effectively screened recipients to comply with statutory recipient enrollment qualifications. Processes of care used by pharmacists indicate that recipients received comprehensive assessments of their drug-related needs and extensive attempts were devoted to conducting follow-up assessments. An analysis of MTMS pharmacists' workflow procedures and patient care processes, as reported by self-assessment, indicates that providers were in substantial compliance with statutory and regulatory requirements for recipient identification, documentation of care, and delivery of complete and comprehensive services.

Another area in which it was reported that the program is working well is physician communication. Physician communication is occurring in various ways among different practice sites. Those with integrated electronic medical records document MTMS in the patient chart attaching a summary note to the physician. In other sites, pharmacists see patients with physicians and their recommendations are acted upon at the point of care. In others, documentation is provided by phone and fax. Establishing a

relationship with a physician was cited by participants as an important component in physician acceptance. Methods used to establish relationships include presenting in-service education programs, calling upon physicians to explain the service, and providing brochures. Program participants also reported that overall physician and patient satisfaction with the program was high.

Networking among MTMS providers was noted as being important to the program's success. MTMS providers value networking with one another to share successes and learn from each other. Networking examples include local gatherings, ITV meetings among rural providers, as well as work of the Minnesota Pharmacists Association Medication Therapy Management Task Force.

One other area of program success noted by MTMS providers includes Minnesota Department of Human Services (DHS) efforts to launch the program and communicate with providers. These efforts include the DHS Help Desk, use of the MN-ITS system for recipient verification, provider enrollment, and the DHS Web site. Many of the successes in these areas can be traced to work of the DHS Advisory Committee in gathering input from key stakeholders prior to program implementation.

Program Improvement Analysis

While overall patient identification is not a significant program barrier, recipients making and keeping follow-up appointments has been a challenge in this program. There were also a number of barriers cited in program implementation by the pre-paid health plans (PPHP). In the first three months of 2007, challenges posed by the PPHP plans related to provider enrollment and contracting, recipient identification, verification of eligibility, and billing.

The widespread consensus among the pharmacists providing MTMS was that program awareness needs to increase within the provider community. It was recognized that efforts to improve State program awareness may need to be different than commercial insurer programs that notify patients directly about the availability of the MTMS health benefit. Therefore, devoting resources toward increasing physician awareness of the MTMS health benefit may improve recipient participation in the program.

A dominant recurring theme throughout this analysis is that pharmacists who have established collaborative relationships with physicians and other primary care providers were successful in providing MTMS in the first year of the program. (See Table 3). Ease of communication and coordination of care among multiple providers is further facilitated by use of a common electronic medical record within an integrated health care delivery system. Ideally, MTMS software programs would be fully integrated into existing electronic medical records systems eliminating the need for double entry, reducing data transfer errors, and improving efficiency. Finally, to improve effectiveness of services delivered to recipients it was suggested that State of Minnesota health literacy tools be utilized by pharmacists.

RECOMMENDATIONS

The following recommendations for program improvement were developed through discussions and interviews with pharmacists (n=26) providing MTMS during the first year of the program using focus group surveys and meetings. The specific recommendations presented below represent recurring themes cited by a majority of focus group participants.

Recommendations for program improvement include:

General:

- ❖ Increasing physician awareness of the MTMS health benefit.
- ❖ Coordinating benefits of recipients to foster collaboration between recipients' case workers, social workers and MTMS providers.
- ❖ Integrating electronic medical records with pharmaceutical care documentation systems to reduce data entry.

Identifying potential eligible recipients:

- ❖ Matching eligible recipients to MTMS providers by geographic location.
- ❖ Using the DHS MTMS algorithm to identify eligible recipients in geographic areas that do not currently have an enrolled MTMS provider.
- ❖ Sending lists of eligible recipients to MTMS providers so that providers may contact eligible recipients.
- ❖ Communicating with eligible recipients, if possible, to explain MTMS and providing them with a list of enrolled MTMS providers.

Removing potential barriers to recipients:

- ❖ Incorporating tools available through the Minnesota Literacy Council and the Minnesota Department of Children Families and Learning to deliver MTMS more effectively to recipients who speak languages other than English (LaRue Medical Literacy Exercises available at: <http://www.mcedservices.com/medex/medex.htm>).
- ❖ Providing transportation for recipients' MTMS appointments.
- ❖ Providing coverage for MTMS delivered in recipients' homes.
- ❖ Providing a prescription co-payment incentive to recipients for continued use of the MTMS benefit.

Improving billing procedures:

- ❖ Continuing to clarify procedures for obtaining MTMS prior authorization for recipients requiring more than eight visits per year, as well as for a recipient with a drug therapy problem that has resulted or is likely to result in significant non-drug program costs.
- ❖ Improving the PPHP recipient identification, verification, and billing processes. It was suggested that recipient PPHP Identification Numbers be added to the DHS MN-ITS Web site.

Professional development:

- ❖ Encouraging MTMS providers to mentor other pharmacists to accelerate program expansion and recipient access to MTMS.

- ❖ Networking among providers to address challenges including workflow management, staffing, documentation requirements, and clinical confidence.
- Other:
- ❖ Requiring patients undergoing treatment for chronic pain to use the MTMS benefit.

Suggestions

There were also a number of suggestions provided during the course of this analysis. Additional suggestions were mentioned by some program participants for program improvement.

Suggestions for program improvements include:

- ❖ Conducting periodic meetings between DHS and providers to maintain the continuous quality improvement focus of the program.
- ❖ Using the Internet or ITV for networking among pharmacists in rural areas.
- ❖ Eliminating the electronic MTMS record-keeping requirement for pharmacies with a small Medicaid population as this can be an economic barrier.
- ❖ Conducting patient satisfaction surveys after recipients have been in the program.
- ❖ Updating the RBRVS grid on the DHS Web site to delete the “time” column since it can confuse providers who do not use an electronic pharmaceutical care documentation system to correctly bill for MTMS.
- ❖ Changing federal laws to permit dual-eligible Medicaid/Medicare patients to be eligible for the State MTM Care Program.

CONCLUSIONS

The analytical study period for this evaluation was April 1, 2006 to March 31, 2007 (the first year of the program). Specific evaluation objectives addressed by this project were:

- (1) Does the provision of MTMS by pharmacists improve patient care?
- (2) Does the provision of MTMS by pharmacists affect quality of care?
- (3) Does MTMS provided by pharmacists have an impact on health expenditures?
- (4) What program improvements and enhancements would support the MTMS program’s continued application?

During the first year of the MTM Care Program 34 pharmacists provided MTMS to 259 recipients. The 259 recipients had a total of 431 MTMS encounters and pharmacists were paid \$39,866 for the delivery of MTMS during the one-year program period. The age range of recipients receiving MTMS was 12 to 91 years old (median age 52) with 97% (250/259) of recipients under the age of 65.

The four components of outcomes data included in this analysis are: clinical, economic, program implementation, and program improvement. Clinical outcomes analysis included evaluating drug therapy problems identified and resolved, goals of therapy achieved, and performance-based benchmark standards achieved for recipients with diabetes and coronary heart disease. Economic outcomes analysis included comparing total health care expenditures for recipients before and after receiving MTMS, and measuring the value-based purchasing impact of recipients meeting performance-based benchmark standards. Program implementation and program improvement were evaluated using medical records chart abstraction review, self-assessment surveys, and focus group interviews and meetings.

Pharmacists in this one year analysis identified and resolved 789 drug therapy problems (3.1 drug therapy problems per patient), which can be compared to the 3.3 drug therapy problems resolved in a national sample of nearly 3000 patients over a four year period (2000 – 2003). Combining the high number of drug therapy problems resolved with the number of drugs (14/recipient) and medical indications (6/recipient) demonstrates that recipients with complex medical and drug-related needs were served in the first year of the program.

Clinical outcomes achieved in this analysis were very good as demonstrated by improvements in goals of therapy achieved as well as drug therapy problems resolved. In addition, quality of care performance benchmarks (QCare standards) achieved in recipients with diabetes was higher than the State average.

An analysis of a sample of 167 recipients' pharmaceutical care documentation summary reports indicated that MTMS recipients had an average of 6.3 medical indications per patient (range = 1 – 20, std. dev. = 4.8) and were taking 14.1 drugs (10.5 prescription plus 3.6 non-prescription drugs) per patient (range = 1 – 35, std. dev. = 6.5). In the analysis of these same 167 recipients' records, goals of therapy achieved improved from 76% to 87% after recipients' MTMS encounters during Year One.

Medical records chart abstraction used to evaluate the achievement of performance-based benchmark standards indicates that 36% (41/114) of recipients with diabetes achieved all performance benchmark criteria using State of Minnesota QCare (Quality Care and Rewarding Excellence) standards. Achievement of QCare standards demonstrates an important contribution of pharmacists' MTMS to quality of care and health care effectiveness. When drug therapy problems are resolved patients achieve desired goals of therapy. Noteworthy in this analysis is that 77% (88/114) of recipients with diabetes achieved the QCare 2006 hemoglobin A₁C benchmark goal.

Economic evaluation of recipient claims before and after MTMS was restricted due to the fact that only 77 recipients had at least 6-months pre-, and 6-months post-intervention health care claims at the time of this analysis, and because 35% of health claims for recipients with pre-paid health plan (PPHP) coverage could not be supplied by PPHP's for use in this analysis. Although total health expenditures were higher in the post-intervention period, 24% of this difference was accounted for by increases in

prescription expenditures. (See Table 8). This finding is not surprising, since inadequate therapy (e.g. drug therapy problem categories of dose too low for effectiveness, needs additional drug therapy primarily for prevention, and noncompliance) accounted for 73% (429 of 587) of the drug therapy problems resolved by MTMS providers. This correction of inadequate therapy and initiation of preventive therapy resulted in the appropriate treatment of medical conditions with medications.

Analysis of the value-based purchasing impact of MTMS focused on care delivered to recipients with diabetes. The Minnesota Department of Health (MDH) estimates for statewide annual savings from QCare standards for diabetes care were used in this analysis. The MDH estimates include an annual cost savings amount of \$403.30 per patient for individuals in Minnesota over the age of 18 achieving “optimal care” benchmarks for diabetes. Among the 114 MTMS recipients with diabetes, 36% (41/114) of these recipients achieved all optimal care benchmark standards. It is noted that the statewide average for achieving all diabetes performance benchmarks is 6% although comparisons between these medical assistance MTMS recipients and diabetes patients statewide are difficult to make based upon results of this analysis. Even though a cause-and-effect relationship can not be firmly established, potential annual cost savings among the 41 MTMS recipients with diabetes would be \$15,325.

Although there may be limitations to this cost savings methodology, these estimates could also conservatively under-estimate savings as 77% (88/114) of recipients with diabetes achieved the QCare A₁C benchmark goal. The value-based purchasing appeal of MTMS to employers and payers relates to competing on results and improving quality in healthcare by achieving evidence-based goals of therapy. By achieving desired goals of therapy while decreasing drug-related morbidity and mortality, the provision of MTMS has favorable value-based purchasing implications.

The most productive pharmacists in the first year of the MTMS program were those who established collaborative practice relationships with physicians and other primary care providers. The ten most active MTMS pharmacists, in terms of recipient encounters and drug therapy problems resolved, were collaborating with physicians and other primary care providers and were integrated into health delivery systems. This finding is consistent with health care delivery improvements advocated in the chronic care model and the medical home model concepts.

Continuous quality improvement analysis indicates that the State of Minnesota effectively implemented the MTM Care Program by developing tools, procedures and communications processes that were not previously available in other state Medicaid programs. Work of the DHS MTMS Advisory Committee prior to program implementation was very important to successful implementation. Pharmacists participating in the program effectively screened recipients to comply with statutory recipient enrollment qualifications. Processes of care used by pharmacists indicate that recipients’ received comprehensive assessments of their drug-related needs and extensive attempts were devoted to conducting follow-up assessments.

Although pharmacists were able to identify recipients qualifying for MTMS coverage, there was a high rate of appointment non-adherence among recipients, and there was difficulty maintaining follow-up contact with recipients. The State of Minnesota tested a claims-based algorithm for identifying recipients eligible for MTMS with a limited number of MTMS pharmacists. During focus group interviews, pharmacists noted that the MTMS algorithm could be useful in helping to identify eligible recipients who may visit other clinics or pharmacies that do not offer MTMS.

The program implementation and program improvement analyses were conducted by using a continuous quality improvement (CQI) framework. The CQI framework is predicated on the concept that program participants have an inherent desire to increase quality and raise standards by continually solving problems and improving processes. A number of tools and procedures were used to implement the program including provider enrollment, on-line billing, and provider communications. Cooperation in program implementation among the state professional association, academia and the State of Minnesota were essential to successful program implementation.

Analysis of documentation elements in comparison to statutory and regulatory requirements indicates that there was greater than 90% compliance with 11 of 14 essential documentation elements. The documentation requirement of linking recipients' medical conditions to the drugs and dosages being used to treat each condition (60% compliance) represents an area in which pharmacists in this analysis could improve documentation.

Medical records chart review of 48% (126 of 259) of recipient records indicated that about 60% of MTMS claims were submitted at a resource-based relative value scale (RBRVS) level commensurate with evidence documented in recipients' records, 30% of recipients' records contained documentation that would have supported billing at an RBRVS level higher than that which was billed to the State, and 10% of MTMS claims were submitted at a level that was not fully supported by documentation contained in recipients' medical records. This finding indicates that MTMS providers adhered to the RBRVS billing criteria with one-third of claims conservatively submitted below permissible levels.

Based on results from the provider focus group interviews and meetings it is noted that providers were able to identify recipients who met the statutory qualifications for program participation. However, it was suggested that recipients from geographic areas without access to MTMS providers be referred to sites that are providing the MTMS service. In addition, it was demonstrated that program recipients had appointment scheduling non-adherence rates ("no-show rates") nearly twice the general population. Transportation difficulties were cited by MTMS providers as a primary reason for this no-show rate and it was suggested that recipients' case managers and social workers be contacted to assist in resolving transportation problems. There were also a number of implementation challenges that occurred with the transfer of MTMS payment responsibility to the pre-paid health plans in 2007.

The results of this analysis indicate that the provision of MTMS by pharmacists improves patient care and positively affects quality of care. The State of Minnesota MTM Care Program was effectively implemented and providers cared for recipients with complex medical needs. Finally, a number of strategies were proposed during the focus group meetings that would encourage further development of MTMS services and thereby continue to improve the health of the Minnesota Medicaid recipient population.

References

1. Mikeal RL, Brown TP, Lazarus HL, Vinson MC. Quality of pharmaceutical care in hospitals. *Am J Hosp Pharm* 1975; 32:567-574.
2. Smith WE, Benderev, K. Levels of pharmaceutical care: a theoretical model. *Am J Hosp Pharm* 1991; 48:540-46.
3. Isetts BJ, Brown LM, Schondelmeyer SW, Lenarz LA. Quality assessment of a collaborative approach for decreasing drug-related morbidity and achieving therapeutic goals. *Arch Intern Med* 2003; 163:1813-20.
4. Medicare Payment Advisory Commission, Hackbarth GM (Chair), *Report to the Congress: Medicare Coverage of Nonphysician Practitioners*. Washington DC, June 2002; 21-26.
5. Johnson JA, Bootman JL. Drug-related morbidity and mortality: a cost-of-illness model. *Arch Intern Med*. 1995;155:1949-1956
6. Ernst FR, Grizzle AJ. Drug-related morbidity and mortality: updating the cost-of-illness model. *J Am Pharm Assoc*. 2001;41:192-199
7. Beebe M, Dalton, JA, Duffy C, et. al. *Current Procedural Terminology – CPT® 2006*. Chicago, IL: American Medical Association, 2006.
8. Isetts BJ, Buffington DE. CPT code-change proposal: National data on pharmacists' medication therapy management services. *J Am Pharm Assoc* 2007; 47:491-95.
9. Bluml BJ. Definition of medication therapy management: Development of professionwide consensus. *J Am Pharm Assoc* 2005; 45:566-72.
10. *CPT Changes 2006: An Insider's View*. Chicago IL: American Medical Association, 2005, pp.309-12.
11. Bluml BM, McKenney JM, Cziraky MJ. Pharmaceutical care services and results in project impact: hyperlipidemia. *J Am Pharm Assoc* 2000; 40:157-73.
12. Cranor CW, Christensen DB. The Asheville project: short-term outcomes of a community pharmacy diabetes care program. *J Am Pharm Assoc* 2003; 43:149-59.
13. Tsuyuki RT, Johnson JA, Teo KK, et al. A randomized trial of the effect of community pharmacist intervention on cholesterol risk management. The study of cardiovascular risk intervention by pharmacists (SCRIP). *Arch Intern Med* 2002; 162:1149-55.
14. Erickson SR, Slaughter MS, Halapy H. Pharmacists' ability to influence outcomes of hypertension therapy. *Pharmacotherapy* 1997; 17:140-147)
15. Shibley MC, Pugh CB. Implementation of pharmaceutical care services for patients with dyslipidemias by independent community pharmacy practitioners. *Ann*

- Pharmacother* 1997; 31:713-19.
16. Beney J, Bero LA, Bond C. *Expanding the roles of outpatient pharmacists: effects on health services utilisation, costs, and patient outcomes* (Cochrane Review). In: The Cochrane Library, issue 1, 2004. Oxford, UK: Update Software. Accessed April 7, 2004.
 17. Leape LL, Cullen DJ, Clapp MD, Burdick E, Demonaco HJ, Erickson JI, et al. Pharmacist participation on physician rounds and adverse drug events in the intensive care unit. *JAMA* 1999; 282:267-70.
 18. Kucukarslan SN, Peters M, Mlynarek M, Nafziger DA. Pharmacists on rounding teams reduce preventable adverse drug events in hospital general medicine units. *Arch Intern Med* 2003; 163:2014-18.
 19. Chiquette E, Amoato MG, Bussey HI. Comparison of an anticoagulation clinic with usual medical care: anticoagulation control, patient outcomes, and health care costs. *Arch Intern Med* 1998; 158:1641-47.
 20. Kaushal R, Bates DW. The Clinical Pharmacist's Role in Preventing Adverse Drug Events (Chapter 7). In: Shojania K, Duncan B, McDonald K, Wachter RM, eds. *Making Health Care Safer: A Critical Analysis of Patient Safety Practices*. Rockville, MD: Agency for Healthcare Research and Quality; 2001. Evidence Report/Technology Assessment No. 43; AHRQ publication 01-E058.
 21. Gattis WA, Hasselblad V, Whellan DJ, O'Connor CM. Reduction in heart failure events by the addition of a clinical pharmacist to the heart failure management team: results of the pharmacist in heart failure assessment recommendation and monitoring (PHARM) study. *Arch Intern Med* 1999; 159:1939-45.
 22. Cranor CW, Christensen DB. The Asheville Project: Long-Term Clinical and Economic Outcomes of a Community Pharmacy Diabetes Care Program. *J Am Pharm Assoc* 2003; 43:173-84.
 23. Schumock GT, Butler MG, et al. "Evidence of the Economic Benefit of Clinical Pharmacy Services – 1996-2000." *Pharmacotherapy* 2003; 23:113-32.
 24. Johnson JA, Bootman JL. Drug-related morbidity and mortality and the economic impact of pharmaceutical care. *Am J Hlth Syst Pharm* 1997; 54:554-58.
 25. Schumock GT, Meek PD, Ploetz, PA, Vermeulen LC. Economic evaluation of clinical pharmacy service -- 1988-1995. *Pharmacotherapy* 1996; 16:1188-208.
 26. Hatoum HT, Akhras K. 1993 Bibliography: a 32-year literature review on the value and acceptance of ambulatory care provided by pharmacists. *Ann Pharmacother* 1993; 27:1106-19.
 27. Cipolle RJ, Strand LM, Morley PC. *Pharmaceutical Care Practice: The Clinician's Guide*. New York: McGraw-Hill, 2004.
 28. Hasio WC, Braun P, Yntema D, Becker ER. Estimating physicians' work for a resource-based relative-value scale. *N Engl J Med*. 1988; 319:835-41.
 29. Lee PR, Ginsburg PB, LeRoy LB, Hammons GT. The Physician Payment Review Commission Report to Congress. *JAMA*. 1989; 261:2382-85.
 30. Gallagher PE, ed. *Medicare RBRVS: The Physicians' Guide*. Chicago, IL: American Medical Association, 2005, p. 35.
 31. Cipolle RJ, Strand LM, Morley PC. *Pharmaceutical Care Practice*. New York: McGraw-Hill, 1998.
 32. Durenberger D., Chair. Listening to Minnesotans: Transforming Minnesota's Health

Care System. Report of the Minnesota Citizens Forum on Health Care Costs, February 23, 2004.

Available at:

http://www.oregon.gov/DAS/OHPPR/HPC/docs/mat04/Minnesota_Final.pdf,

Accessed October 18, 2007.

33. Porter ME, Teisberg EO. *Redefining Health Care: Creating Value-based Competition on Results*. Boston: Harvard Business School Press, 2006.
34. Meyer J, Rybowski L, Eichler R. *Theory and Reality of Value-Based Purchasing: Lessons from the Pioneers*. AHRQ Publication No. 98-0004, Summary Report available at: <http://www.ahrq.gov/qual/meyerrpt.htm>, Accessed 14 July 2007.
35. Webber A. Building the business case for quality improvement. *J Am Pharm Assoc* 2005; 45:437-42.
36. U.S. Department of Health and Human Services. *Statement of Support: Four Cornerstones of Value-driven Health Care*. Available at: <http://www.hhs.gov/valuedriven/government/minnesotastatement.pdf>, Accessed October 18, 2007.
37. QCare Fact Sheets, Minnesota Department of Health, available at: <http://www.health.state.mn.us/healthinfo/qcare.html>, accessed September 30, 2006.
38. O'Connor PJ, Gilmer TP, Rush WA, Manning WG. *Impact of the ICSI Diabetes Clinical Guideline on Costs and Quality of Diabetes Care: Baseline Data and Potential for Improvement*. Minneapolis: Institute for Clinical Systems Improvement, 1996.
39. Pharmacy Self-Inspection. *Wisconsin Regulatory Digest*, Vol. 12, No.2, October, 2001, pps. 1-2.
40. Beebe M, Dalton, JA, Duffy C, et. al. *Current Procedural Terminology – CPT® 2008*. Chicago: American Medical Association, 2008.
41. *Medication Therapy Management in Community Pharmacy Practice: Core Elements of an MTM Service*, Version 1.0. Washington DC: American Pharmacists Association/National Association of Chain Drug Stores Foundation, April 29, 2005. Available at: http://www.pharmacist.com/AM/Template.cfm?Section=Pharmacist_Practitioners&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=14185. Accessed October 31, 2007.
42. Strand LM, Cipolle RJ, Morley PC, Frakes MJ. The impact of pharmaceutical care practice on the practitioner and the patient in the ambulatory practice setting: twenty-five years of experience. *Curr Pharm Design* 10:3987-4001, 2004.
43. Rand Corporation, for the Robert Wood Johnson Foundation (October 2007 Update). *Evaluation of the effectiveness of the Chronic Care Model*. Chronic Illness Care Breakthrough Series Cooperatives, Available at: <http://www.rand.org/health/ICICE>, Accessed December 4, 2007.
44. Beal AC, Doty MM, Hernandez SE, Shea KK, and Davis K. *Closing the Divide: How Medical Homes Promote Equity in Health Care*. Results from The Commonwealth Fund 2006 Health Care Quality Survey, The Commonwealth Fund, June 2007. Available at: http://www.commonwealthfund.org/usr_doc/1035_Beal_closing_divide_medical_homes.pdf?section=4039, Accessed December 4, 2007.

45. *Baby Boomers and Cardiovascular Diseases – Statistics*. Statistical Fact Sheet – Populations, 2007 Update, American Heart Association. Available at: <http://www.americanheart.org/downloadable/heart/1174601426834BabyBoomers07.pdf>. Accessed November 12, 2007.
46. Gonen B, Rachman H, Rubenstein AH, Tanega SP, Horwitz DL: Hemoglobin A_{1c} as an indicator of the degree of glucose intolerance in diabetics. *Lancet* 1977; 2:734 -37. 1977.
47. Nathan DM, Singer DE, Hurxthal K, Goodson JD: The clinical information value of the glycosylated hemoglobin assay. *N Engl J Med* 1984; 310:341-46.
48. Singer DE, Coley CM, Samet JH, Nathan DM: Tests of glycemia in diabetes mellitus: their use in establishing a diagnosis and treatment. *Ann Intern Med* 1989; 110:125-37.

End of References Section.

Appendix A: MTM Care Program Statutory Language

369.17 Subd. 13h. [MEDICATION THERAPY MANAGEMENT CARE.] (a)
369.18 Medical assistance and general assistance medical care cover
369.19 medication therapy management services for a recipient taking
369.20 four or more prescriptions to treat or prevent two or more
369.21 chronic medical conditions, or a recipient with a drug therapy
369.22 problem that is identified or prior authorized by the
369.23 commissioner that has resulted or is likely to result in
369.24 significant nondrug program costs. The commissioner may cover
369.25 medical therapy management services under MinnesotaCare if the
369.26 commissioner determines this is cost-effective. For purposes of
369.27 this subdivision, "medication therapy management" means the
369.28 provision of the following pharmaceutical care services by a
369.29 licensed pharmacist to optimize the therapeutic outcomes of the
369.30 patient's medications:
369.31 (1) performing or obtaining necessary assessments of the
369.32 patient's health status;
369.33 (2) formulating a medication treatment plan;
369.34 (3) monitoring and evaluating the patient's response to
369.35 therapy, including safety and effectiveness;
369.36 (4) performing a comprehensive medication review to
370.1 identify, resolve, and prevent medication-related problems,
370.2 including adverse drug events;
370.3 (5) documenting the care delivered and communicating
370.4 essential information to the patient's other primary care
370.5 providers;
370.6 (6) providing verbal education and training designed to
370.7 enhance patient understanding and appropriate use of the
370.8 patient's medications;
370.9 (7) providing information, support services, and resources
370.10 designed to enhance patient adherence with the patient's
370.11 therapeutic regimens; and
370.12 (8) coordinating and integrating medication therapy
370.13 management services within the broader health care management
370.14 services being provided to the patient.
370.15 Nothing in this subdivision shall be construed to expand or
370.16 modify the scope of practice of the pharmacist as defined in
370.17 section 151.01, subdivision 27.
370.18 (b) To be eligible for reimbursement for services under
370.19 this subdivision, a pharmacist must meet the following
370.20 requirements:
370.21 (1) have a valid license issued under chapter 151;
370.22 (2) have graduated from an accredited college of pharmacy
370.23 on or after May 1996, or completed a structured and
370.24 comprehensive education program approved by the Board of
370.25 Pharmacy and the American Council of Pharmaceutical Education
370.26 for the provision and documentation of pharmaceutical care
370.27 management services that has both clinical and didactic
370.28 elements;
370.29 (3) be practicing in an ambulatory care setting as part of
370.30 a multidisciplinary team or have developed a structured patient
370.31 care process that is offered in a private or semiprivate
370.32 care area that is separate from the commercial business that
370.33 also occurs in the setting; and
370.34 (4) make use of an electronic patient record system that
370.35 meets state standards.

370.36 (c) For purposes of reimbursement for medication therapy
371.1 management services, the commissioner may enroll individual
371.2 pharmacists as medical assistance & general assistance medical
371.3 care providers. The commissioner may also establish contact
371.4 requirements between the pharmacist and recipient, including
371.5 limiting the number of reimbursable consultations per recipient
371.6 (d) The commissioner, after receiving recommendations from
371.7 professional medical associations, professional pharmacy
371.8 associations, and consumer groups, shall convene an 11-member
371.9 Medication Therapy Management Advisory Committee to advise the
371.10 commissioner on the implementation and administration of
371.11 medication therapy management services. The committee shall be
371.12 comprised of: two licensed physicians; two licensed
371.13 pharmacists; two consumer representatives; two health plan
371.14 company representatives; and three members with expertise in
371.15 areas of medication therapy management, who may be licensed
371.16 physicians or licensed pharmacists. The committee is governed
371.17 by section 15.059, except that committee members do not receive
371.18 compensation or reimbursement for expenses. The advisory
371.19 committee expires on June 30, 2007.
371.20 (e) The commissioner shall evaluate the effect of
371.21 medication therapy management on quality of care, patient
371.22 outcomes, and program costs, and shall include a description of
371.23 any savings generated in the medical assistance and general
371.24 assistance medical care programs that can be attributable to
371.25 this coverage. The evaluation shall be submitted to the
371.26 legislature by December 15, 2007. The commissioner may contract
371.27 with a vendor or an academic institution that has expertise in
371.28 evaluating health care outcomes for the purpose of completing
371.29 the evaluation.
371.30 **[EFFECTIVE DATE.]** This section is effective August 1, 2005.

Appendix B: QCare Diabetes – MTMS Chart Abstraction Instrument

Diabetes Chart Abstract

Name: _____
Recipient ID: _____
DOB: _____
Date of 1st MTMS encounter: _____

| DIABETES OUTCOMES: | First Value ^{a)} | Second Value ^{a)} | Third Value ^{a)} |
|--|-----------------------------|-----------------------------|-----------------------------|
| <input type="checkbox"/> A1c <8% | Date: _____ Value: _____ | Date: _____ Value: _____ | Date: _____ Value: _____ |
| <input type="checkbox"/> LDL <130 mg/dl | Date: _____ Value: _____ | Date: _____ Value: _____ | Date: _____ Value: _____ |
| <input type="checkbox"/> Blood pressure <130/85 | Date: _____ Value: _____ | Date: _____ Value: _____ | Date: _____ Value: _____ |
| <input type="checkbox"/> Daily aspirin use if over 41 y.o.: | | | |
| Age: _____ | | | |
| Contraindication to aspirin (y/n): _____ | | | |
| <input type="checkbox"/> Tobacco Use History: | | | |
| <input type="checkbox"/> Current <input type="checkbox"/> Former <input type="checkbox"/> Never used | | | |
| <input type="checkbox"/> Meets all criteria | | | |

a) Time period of measurements were up to one year after each recipients initial MTMS encounter.

Date of Review _____

Appendix C: QCare Coronary Heart Disease - MTMS Abstraction Instrument

CHD Chart Abstract

Name: _____
Recipient ID: _____
DOB: _____
Date of 1st MTMS encounter: _____

| CHD OUTCOMES: | First Value ^a | Second Value ^a | Third Value ^a |
|--|-----------------------------|-----------------------------|-----------------------------|
| <input type="checkbox"/> LDL <100mg/dl | Date: _____ Value: _____ | Date: _____ Value: _____ | Date: _____ Value: _____ |
| <input type="checkbox"/> Diabetic | | | |
| <input type="checkbox"/> Blood pressure <140/90 (if diabetic, (must be <130/80) | Date: _____ Value: _____ | Date: _____ Value: _____ | Date: _____ Value: _____ |
| <input type="checkbox"/> Daily aspirin use Contraindication to aspirin (y/n): _____ | | | |
| <input type="checkbox"/> Tobacco Use History <input type="checkbox"/> Current <input type="checkbox"/> Former <input type="checkbox"/> Never used | | | |
| <input type="checkbox"/> Meets all criteria | | | |

a) Time period of measurements were up to one year after each recipients initial MTMS encounter.

Date of Review _____

Appendix D: Self-Assessment Form - Evaluating Effectiveness of the Minnesota Medication Therapy Management Care Program

Mail to: **Brian J. Isetts**
University of Minnesota College of Pharmacy
Weaver-Densford Hall, Room 7-175
308 Harvard Street, SE
Minneapolis, MN 55455

Phone: (612) 624-2140
 Email: isett001@umn.edu

Other university degrees: _____
 Added qualifications: _____

Describe your patient care process (from appointment scheduling through assessment and setting follow-up appointments): _____

Name: _____
 Primary Practice Address: _____

 College of Pharmacy attended, degree, and year: _____

Check all that apply to your MTM documentation and practice:

_____ 1. Electronic MTM record
 If so, what program? _____

_____ 11. List of environmental factors that impact the patient
 _____ 12. Assessment of drug therapy problems
 _____ 13. Written care plan for achieving goals of therapy and resolving drug therapy problems
 _____ 14. Information, instructions, and resources delivered to the patient

PATIENT INFORMATION

_____ 2. Current and resolved medical conditions
 _____ 3. Allergies
 _____ 4. Primary physician and contact information

PRACTICE MANAGEMENT

_____ 15. Appointment scheduling system
 _____ 16. Patient HIPAA release
 _____ 17. Claims reconciliation process
 _____ 18. Collaborative practice agreements
 If yes, for what conditions? _____
 _____ 19. Prescriber communication forms (please enclose)
 _____ 20. Marketing material (please enclose)

OTHER INFORMATION

_____ 5. Date of patient encounter
 _____ 6. Time spent with patient
 _____ 7. List of all active prescription and nonprescription drugs (including herbal and dietary supplements) with their indications
 _____ 8. List of drug doses, directions and intended use
 _____ 9. List of all relevant medical devices
 _____ 10. Alcohol and tobacco use history

Date of Audit: _____
 Document Verification: _____ MTM Claim Audit: _____
 Source of Record: _____

Appendix E: MTMS Documentation Chart Abstraction Instrument

Name: _____
 Recipient ID: _____
 DOB: _____

Date of first MTM encounter: _____
 Location of encounter: _____
 Multiple encounters (y/n): _____

DOCUMENTATION:

- EMR
- Current & resolved medical conditions
- Allergies
- Physician contact info
- Time spent with patient
- List of all drugs and indications
- Drug doses, directions & use
- Relevant medical devices
- Alcohol/tobacco history
- Environmental factors
- Assessment of drug therapy problems
- Written care plan
- Info, instructions and resources delivered to patient

Visit Date: _____
 # of medications: _____
 # of drug therapy problems: _____

Indication
 Unnecessary drug therapy _____
 Needs additional drug therapy _____

Effectiveness
 Ineffective drug _____
 Dosage too low _____

Safety
 Adverse drug reaction _____
 Dosage too high _____

Compliance
 Noncompliance _____

of medical conditions: _____
 Primary condition: _____
 ICD9 Code: _____

Conditions: _____

Meds: _____

Drug therapy problems:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Appendix F. MTMS 2008 CPT Codes⁴⁰

Medication Therapy Management Services◀◀

Medication therapy management service(s) (MTMS) describe face-to-face patient assessment and intervention as appropriate, by a pharmacist, upon request. MTMS is provided to optimize the response to medications or to manage treatment-related medication interactions or complications.◀

MTMS includes the following documented elements: review of the pertinent patient history, medication profile (prescription and nonprescription), and recommendations for improving health outcomes and treatment compliance. These codes are not to be used to describe the provision of product-specific information at the point of dispensing or any other routine dispensing-related activities.◀

- 99605** Medication therapy management service(s) provided by a pharmacist, individual, face-to-face with patient, with assessment and intervention if provided; initial 15 minutes, new patient
- 99606** initial 15 minutes, established patient
- + **99607** each additional 15 minutes (List separately in addition to code for primary service)

(Use 99607 in conjunction with 99605, 99606)◀

Rationale

A new subsection, guidelines, and three codes (99605-99607) have been established to report provision of medication therapy management services by a pharmacist. Code 99605 is intended to be reported for the initial encounter and review of the patient's medications. Code 99606 is reported for management sessions with the established patient. Codes 99605 and 99606 represent the initial 15 minutes for the service. Code 99607 is intended to report services requiring additional increments of 15 minutes beyond that reported with codes 99605 and 99606.

Guidelines have been added to define the circumstances under which these codes are or are not reported appropriately. The guidelines instruct that these services are performed at the request of the patient. Services provided are required to be documented and include review of the pertinent patient history, medication profile (prescription and nonprescription), and recommendations for improving health outcomes and treatment compliance. As indicated, these codes are not to be used to describe the provision of product-specific information at the point of dispensing or any other routine dispensing-related activities. Services provided subsequent to the initial patient service by the same business at a separate location should be reported with the established patient code 99606.

Appendix G: MTMS Provider Pre-Focus Group Survey Instrument

Evaluating Effectiveness of the Minnesota Medication Therapy Management (MTM) Care Program—Pre-Focus Group Questionnaire

Please return by **SEPTEMBER 17th** via fax (612-625-9931) or e-mail to:

Brian J. Isetts
 University of Minnesota College of Pharmacy
 Weaver-Densford Hall, Room 7-175
 308 Harvard Street, SE
 Minneapolis, MN 55455

Phone: (612) 624-2140

Email: isett001@umn.edu

Your name: _____

Your primary practice site: _____

Date & Meeting Site You Will Attend _____

What educational programs did you complete to assist with your practice? _____

What educational programs would help you in your practice in the future? _____

How did you learn about the MN MTM Care Program?
 (Please describe): _____

Please indicate your level of agreement with the following statements pertaining to your MN MTM Program practice:

- Being a MN MTM provider has been a positive experience.
- I have been able to identify patients who need this service.
- I have been able to recruit patients who need this service.
- The care process I have established is working well.
- I am satisfied with the documentation system I am using.
- I am satisfied with the State of MN Help Desk.

| | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|--|----------------|-------|---------|----------|-------------------|
| Being a MN MTM provider has been a positive experience. | 1 | 2 | 3 | 4 | 5 |
| I have been able to identify patients who need this service. | 1 | 2 | 3 | 4 | 5 |
| I have been able to recruit patients who need this service. | 1 | 2 | 3 | 4 | 5 |
| The care process I have established is working well. | 1 | 2 | 3 | 4 | 5 |
| I am satisfied with the documentation system I am using. | 1 | 2 | 3 | 4 | 5 |
| I am satisfied with the State of MN Help Desk. | 1 | 2 | 3 | 4 | 5 |

The following have been barriers to providing care to patients in my practice:

| | | | | | |
|--|---|---|---|---|---|
| Finding time to provide the service | 1 | 2 | 3 | 4 | 5 |
| Level of payment for the service | 1 | 2 | 3 | 4 | 5 |
| Management support for my practice | 1 | 2 | 3 | 4 | 5 |
| Space and workflow for providing the service | 1 | 2 | 3 | 4 | 5 |
| Learning the patient care process | 1 | 2 | 3 | 4 | 5 |
| Learning my documentation system | 1 | 2 | 3 | 4 | 5 |
| Developing physician relationships | 1 | 2 | 3 | 4 | 5 |
| Communicating with physicians | 1 | 2 | 3 | 4 | 5 |
| Patient resistance to receiving the service | 1 | 2 | 3 | 4 | 5 |
| Identifying patients who need the service | 1 | 2 | 3 | 4 | 5 |
| Patient co-payments for prescription drugs | 1 | 2 | 3 | 4 | 5 |

I would recommend that my colleagues become program providers 1 2 3 4 5

The greatest opportunity the MN MTM program offers is: _____

Appendix H: MDH QCare Cost Savings Estimates (Cardiac care and Diabetes care)

Estimated statewide annual savings from QCare standards for cardiac care and diabetes care (a)

Prepared by Minnesota Department of Health, Health Economics Program
July 2006

| SUMMARY | |
|---|----------------------|
| Total, Cardiac care | \$86,829,857 |
| Total, Diabetes care | \$66,007,441 |
| GRAND TOTAL | \$152,837,298 |
| Estimated total health care spending in Minnesota, 2006 | \$30,536,900,000 |
| Savings as % of total health care spending | 0.5% |

| CARDIAC CARE: | |
|--|---------------------|
| <u>Number of people affected</u> | |
| Population of adults age 18+ (1) | 3,914,917 |
| Estimated prevalence of coronary artery disease in MN (2) | 5.1% |
| Estimated number of adults with coronary artery disease | 199,661 |
| Current estimated % of coronary artery disease patients receiving optimal care (3) | 38% |
| Number of CAD patients receiving optimal care now | 75,871 |
| QCare standard for % receiving optimal care | 90% |
| Number of CAD patients who will receive optimal care under QCare standard | 179,695 |
| Difference between # receiving optimal care under QCare vs. now | 103,824 |
| <u>Cost savings per patient (4)</u> | |
| Cases saved per 1,000 CAD patients with hypertension | 75.5 |
| Percent of CAD patients with hypertension | 82% |
| Overall cases saved per 1,000 CAD patients (with and without hypertension) | 61.9 |
| Cost savings per event saved | \$13,509 |
| Overall cost savings per patient: cost savings per event * cases saved | \$836 |
| <u>Total estimated cost savings</u> | |
| Number of additional patients receiving optimal care | 103,824 |
| Cost savings per patient | \$836 |
| Total cost savings: number of patients * cost savings per patient | \$86,829,857 |

| | |
|--|------|
| Estimated MN prevalence using ratio to national from BRFSS | 5.1% |
| NHANES National prevalence: | 6.9% |
| <u>BRFSS:</u> | |
| US (CAD prevalence, adults over age 18) | 4.5% |
| MN (CAD prevalence, adults over age 18) | 3.3% |
| Ratio of MN to US | 0.73 |

| | |
|--|--------|
| Towers Perrin cost estimate (2004 costs) | 11,755 |
| Annual adjustment for health care spending growth (based on growth in national health expenditures projected by CMS) | 7.2% |
| Cost savings per case, adjusted to 2006 | 13,509 |

a) Estimated statewide annual savings from QCare standards for cardiac care and diabetes care were obtained from Ms. Julie Sonier, Director, Health Economics Program, Division of Health Policy, Minnesota Department of Health

Appendix H: MDH QCare Cost Savings Estimates (Cardiac care and Diabetes care)

| DIABETES CARE: | | |
|---|---------------------|--|
| National estimated savings from optimal care for 80% of patients with diabetes, over 30 years (5) | \$150,000,000,000 | |
| Annual savings (assumes savings each year are the same) (6) | \$5,000,000,000 | |
| Savings as % of annual US health care spending | 0.29% | → Annual savings 5,000,000,000 |
| <u>Adjustment to savings estimate to account for lower diabetes prevalence in MN:</u> | | |
| National estimated savings as % of total health care spending | 0.29% | |
| Ratio of diabetes prevalence in MN to national | 0.79 | → Annual US health care spending 1,700,000,000,000 |
| Adjusted savings estimate, accounting for lower diabetes prevalence | 0.23% | → Savings as % of US health care spending 0.29% |
| <u>Adjustment to savings estimate to account for MN patients already receiving optimal care:</u> | | |
| Percent of MN patients receiving optimal care (8) | 6% | |
| QCare standard for % receiving optimal care | 80% | |
| Improvement needed (percentage points) | 74% | |
| Adjustment applied to savings estimate: Improvement as % of QCare standard | 93% | |
| Adjusted savings estimate (as % of total MN health care spending), accounting for patients already receiving optimal care (9) | 0.22% | |
| <u>Total estimated cost saving</u> | | |
| Rough estimate of 2006 health care spending in Minnesota (10) | \$30,536,900,000 | |
| Estimated % of MN health care spending saved | 0.22% | |
| Savings estimate from achieving QCare standard | \$66,007,441 | |

Notes and sources:

- /1 Based on 2004 estimates from U.S. Bureau of the Census, and assuming growth of 0.7% per year in 2005 and 2006 (same as overall population growth from 2003 to 2004)
- /2 Prevalence of coronary artery disease was estimated by adjusting the national prevalence rate from the National Health and Nutrition Examination Survey (NHANES) by the ratio of the percentage of adults in MN vs nationally who report ever having had a heart attack or angina in the Behavioral Risk Factor Surveillance System telephone survey. This adjustment was made because NHANES is considered a more reliable source than BRFSS, but no state specific estimates are available from NHANES.
- /3 Estimate based on measure calculated by HealthPartners for its members with CAD. (No statewide measure for optimal care for CAD currently exists.)
- /4 Estimates for number of cases saved per 1,000 patients, cost savings per event, and % of CAD patients with hypertension are from Towers Perrin, Cardiac Care Analysis Savings Estimates prepared for Bridges to Excellence, December 29, 2003. MDH used only the savings estimate associated with blood pressure control, which accounted for a majority of the savings estimated for optimal cardiac care. As a result, the MDH estimate is likely conservative because it does not include savings from achieving other aspects of optimal care. Towers Perrin estimated cost savings of \$11,755 per event for 2004. MDH adjusted this figure to 2006 by applying projected national spending growth rates of 7.2% per year from CMS between 2004 and 2006.
- /5 National estimate developed using Archimedes model, a complex mathematical model that evaluates effects of interventions on disease incidence and progression.
- /6 Assuming the same savings each year likely overstates savings in early years and understates savings in later years.
- /7 Diabetes prevalence rates for 2005 from Behavioral Risk Factor Surveillance System
- /8 MN Community Measurement, 2005 Health Care Quality Report, revised measure for optimal diabetes care.
- /9 The national baseline for % of patients currently receiving optimal care is unknown. This downward adjustment to the MN savings estimate likely understates the potential savings in MN (the adjustment assumes the national baseline is zero, while the true baseline is likely higher).
- /10 Minnesota Department of Health, Health Economics Program. Most recent complete estimate is \$24.8 billion in 2003. Growth from 2004 through 2006 estimated at 7.2% per year.

Fiscal Note Request Worksheet

Bill #: HF 979 Title: MA Cover medication therapy management services
 Companion Author: Abeler Agency: Human Services
 #: 973
 Urgent: Due Date: Committee:
 Consolidated: Lead Agency: Contact Person: Char Sadlak 651-296-5599

What version of the bill are you working on?
 (Changing the version of the bill will automatically create a new fiscal note request.)

(The following four fiscal impact questions must be answered before an agency can sign off on a fiscal note.)

| Fiscal Impact | Yes | No |
|--|------------|-----------|
| State (Does this bill have a fiscal impact to your Agency?) | X | |
| Local (Does this bill have a fiscal impact to a Local Gov Body?) | | X |
| Fee/Dept Earnings (Does this bill impact a Fee or Dept Earning?) | | X |
| Tax Revenue (Does this bill impact Tax Revenues?) | | X |

| Dollars (in thousands) | FY05 | FY06 | FY07 | FY08 | FY09 |
|--|------|------|-------|-------|-------|
| Expenditures | | | | | |
| Fund-General | | 52 | (104) | (250) | (321) |
| Fund | | | | | |
| Fund | | | | | |
| Less Agency Can Absorb | | | | | |
| Fund | | | | | |
| Fund | | | | | |
| Fund | | | | | |
| Net Expenditures | | | | | |
| Fund-General | | 52 | (104) | (250) | (321) |
| Fund | | | | | |
| Fund | | | | | |
| Revenues | | | | | |
| Fund-General | | 12 | 20 | 0 | 0 |
| Fund | | | | | |
| Fund | | | | | |
| Net Cost <Savings> | | | | | |
| Fund-General | | 40 | (124) | (250) | (321) |
| Fund | | | | | |
| Fund | | | | | |
| Total Cost <Savings> to the State | | 40 | (124) | (250) | (321) |

| | FY05 | FY06 | FY07 | FY08 | FY09 |
|-----------------------------|------|------|------|------|------|
| Full-Time Equivalent | | | | | |
| Fund-General | | .50 | 0 | 0 | 0 |
| Fund | | | | | |
| Fund | | | | | |
| Total FTE | | .50 | 0 | 0 | 0 |

Bill Description

This bill provides MA coverage for medication therapy management for a recipient taking four or more medications to treat or prevent two or more chronic medical conditions, or for a recipient with a drug therapy problem identified or prior authorized by the commissioner that has resulted in or is likely to result in significant nondrug program costs. It lists the criteria that pharmacists must meet in order to be eligible for reimbursement for medication therapy management.

The bill allows the commissioner to enroll individual pharmacists as MA providers, for purposes of reimbursement for medication therapy management services. Allows the commissioner to establish contact requirements between the pharmacist and recipient.

The bill requires the commissioner, after receiving recommendations from specified groups, to establish a nine-member Medication Therapy Management Advisory Committee, to advise the commissioner on the implementation and administration of medication therapy management services. Specifies membership and governance of the committee.

The bill also requires the commissioner to evaluate the effect of medication therapy management on quality of care, patient outcomes, and program costs, and to include a description of MA savings. Requires the evaluation to be submitted to the legislature by December 15, 2007 and allows the commissioner to contract with a vendor or academic institution in order to complete the evaluation.

Assumptions

See attached worksheets.

Expenditure and/or Revenue Formula

Fiscal Analysis: SF 973 and HF 979
2005 Session

| | |
|--|---------|
| Projected MA enrollees not in managed care, excluding those with Medicare Rx coverage | 130,000 |
| Est. half meet inclusion criteria* | 65,000 |
| Est. 10% get PC services at full operation | 6,500 |
| Est. 2 encounters per recipient | 13,000 |

Annual MA Program Costs

| Reimbursement Level | Distribution of Encounter s | Number of Encounters | Cost per Encounter | Service Payments |
|---------------------|--------------------------------------|----------------------------|--------------------------|---------------------|
| Level 1 | 20.00% | 2,600 | 37.08 | 96,408 |
| Level 2 | 30.00% | 3,900 | 48.02 | 187,278 |
| Level 3 | 30.00% | 3,900 | 63.03 | 245,817 |
| Level 4 | 15.00% | 1,950 | 90.84 | 177,138 |
| Level 5 | 5.00% | 650 | 108.44 | 70,486 |
| Total | 100% | 13,000 | 59.78 | 777,127 |

Annual MA Cost Avoidance**

| Type Of Events Avoided | Minimum Events Avoided | Maximum Events Avoided | Mid-range Events Avoided | Cost per Event | Program Savings |
|------------------------|------------------------------|------------------------------|--------------------------------|----------------------|--------------------|
| Hospitalizations | 40.0 | 60.0 | 50.0 | 14,000 | 700,000 |
| Emergency room visits | 165.0 | 210.0 | 187.5 | 455 | 85,313 |
| Urgent care visits | 120.0 | 150.0 | 135.0 | 135 | 18,225 |
| Clinic office visits | 4800.0 | 5400.0 | 5100.0 | 80 | 408,000 |

Appendix I

| | | | | | |
|-----------------------|-------|-------|-------|--------|-----------|
| Laboratory tests | 275.0 | 360.0 | 317.5 | 25 | 7,938 |
| Home care visits | 16.0 | 30.0 | 23.0 | 265 | 6,095 |
| LTC facility stays | 10.0 | 18.0 | 14.0 | 13,786 | 193,004 |
| Total Program Savings | | | | | 1,418,574 |

| MA Costs (Savings) by FY | FY 2006 | FY 2007 | FY 2008 | FY 2009 |
|---|----------|-----------|-------------|-------------|
| Phase-in service costs | 15% | 70% | 100% | 100% |
| Phase-in cost avoidance | 5% | 60% | 90% | 100% |
| Rx Service Cost | 116,569 | 543,989 | 777,127 | 777,127 |
| Effect on other services | (70,929) | (851,144) | (1,276,717) | (1,418,574) |
| Net MA Eld. & Dis. Basic Cost | 45,640 | (307,156) | (499,590) | (641,447) |
| Federal Share | 22,820 | (153,578) | (249,795) | (320,724) |
| State Share | 22,820 | (153,578) | (249,795) | (320,724) |
| Administrative Costs | | | | |
| Contract for Evaluation | | 50,000 | | |
| Provider Enrollment and training (.50 FTE) | 29,000 | | | |
| Total Admin Costs | 29,000 | 50,000 | 0 | 0 |
| Total Gen. Fund Costs | 51,820 | (103,578) | (249,795) | (320,724) |
| Admin. Reimbursement | 11,600 | 20,000 | 0 | 0 |
| Net Gen. Fund cost | 40,220 | (123,578) | (249,795) | (320,724) |

* Expected patient encounter projections based on the provision of pharmaceutical care to 20,761 patients (59,361 patient encounters) from 1994 – 2004. Data on file in the Peters Institute of Pharmaceutical Care at the University of Minnesota includes 29,986 drug therapy problems identified and resolved by pharmacists throughout the United States and 12 foreign countries.

** Health care savings projections based on a 2000-2004 data set of 4,105 adults, private sector insured patients (10,223 patient encounters) taking at least four drugs to treat or prevent two chronic medical conditions (12,608 drug therapy problems).

Long-Term Fiscal Considerations

Local Government Costs

References/Sources

I have reviewed the content of this fiscal note and believe it is a reasonable estimate of the expenditures and revenues associated with this proposed legislation.

Appendix J: QCare Cost Savings Estimates for MTMS - Diabetes care

Estimated statewide annual savings from QCare standards for diabetes care

Prepared by Minnesota Department of Health, Health Economics Program
July 2006

| DIABETES CARE: | | |
|---|----------------------|------------------------|
| National estimated savings from optimal care for 80% of patients with diabetes, over 30 years (5) | \$150,000,000,000 | |
| Annual savings (assumes savings each year are the same) (6) | \$5,000,000,000 | |
| Savings as % of annual US health care spending | 0.29% | |
| <u>Adjustment to savings estimate to account for lower diabetes prevalence in MN:</u> | | |
| National estimated savings as % of total health care spending | 0.29% | |
| Ratio of diabetes prevalence in MN to national | 0.79 | |
| Adjusted savings estimate, accounting for lower diabetes prevalence | 0.23% | |
| <u>Adjustment to savings estimate to account for MN patients already receiving optimal care:</u> | | |
| Percent of MN patients receiving optimal care (8) | 6% | # of Persons 13,270 |
| QCare standard for % receiving optimal care | 80% | 176,938 |
| Improvement needed (percentage points) | 74% | 163,668 |
| Adjustment applied to savings estimate: Improvement as % of QCare standard | 93% | |
| Adjusted savings estimate (as % of total MN health care spending), accounting for patients already receiving optimal care (9) | 0.22% | |
| Number of people in MN (11) | 5,167,101 | |
| Number of people in MN (Over 18 years) (11) | 3,813,321 | |
| Number of people with diabetes in MN (Over 18 years) | 221,173 | |
| <u>Total estimated cost saving</u> | | |
| Rough estimate of 2006 health care spending in Minnesota (10) | \$30,536,900,000 | |
| Estimated % of MN health care spending saved | 0.22% | |
| Savings per year estimate from achieving QCare standard | \$66,007,441 | |
| Savings per year estimate for each person from achieving QCare standard | \$403.30 | |
| Number of Medicaid patients with diabetes achieving Q Care Standard | 41 | |
| % of Medicaid patients assumed to be at goal before MTM | 6.0% | |
| Number of additional Medicaid patients with diabetes achieving Q Care Standard | 38 | |
| Savings per year estimate from achieving QCare standard | \$ 15,325.46 | |
| Savings over 30 year estimate from achieving QCare standard | \$ 459,763.74 | |

Notes and sources:

/1 Based on 2004 estimates from U.S. Bureau of the Census, and assuming growth of 0.7% per year in 2005 and 2006 (same as overall population growth from 2003 to 2004)

/2 Prevalence of coronary artery disease was estimated by adjusting the national prevalence rate from the National Health and Nutrition Examination Survey (NHANES) by the ratio of the percentage of adults in MN vs nationally who report ever having had a h

/3 Estimate based on measure calculated by HealthPartners for its members with CAD. (No statewide measure for optimal care for CAD currently exists.)

/4 Estimates for number of cases saved per 1,000 patients, cost savings per event, and % of CAD patients with hypertension are from Towers Perrin, Cardiac Care Analysis Savings Estimates prepared for Bridges to Excellence, December 29, 2003. MDH used onl

/5 National estimate developed using Archimedes model, a complex mathematical model that evaluates effects of interventions on disease incidence and progression.

/6 Assuming the same savings each year likely overstates savings in early years and understates savings in later years.

/7 Diabetes prevalence rates for 2005 from Behavioral Risk Factor Surveillance System

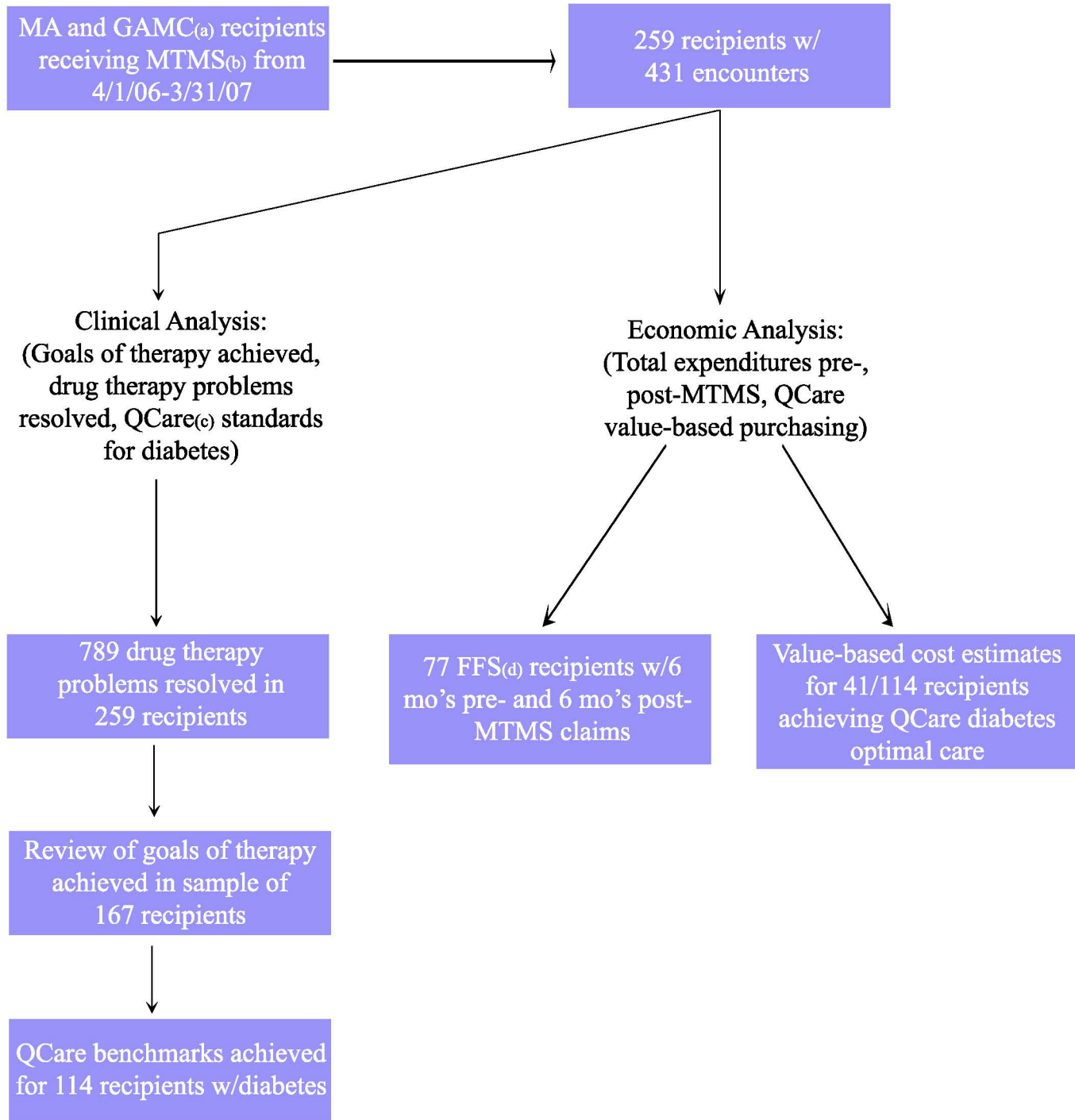
/8 MN Community Measurement, 2005 Health Care Quality Report, revised measure for optimal diabetes care.

/9 The national baseline for % of patients currently receiving optimal care is unknown. This downward adjustment to the MN savings estimate likely understates the potential savings in MN (the adjustment assumes the national baseline is zero, while the tr

/10 Minnesota Department of Health, Health Economics Program. Most recent complete estimate is \$24.8 billion in 2003. Growth from 2004 through 2006 estimated at 7.2% per year.

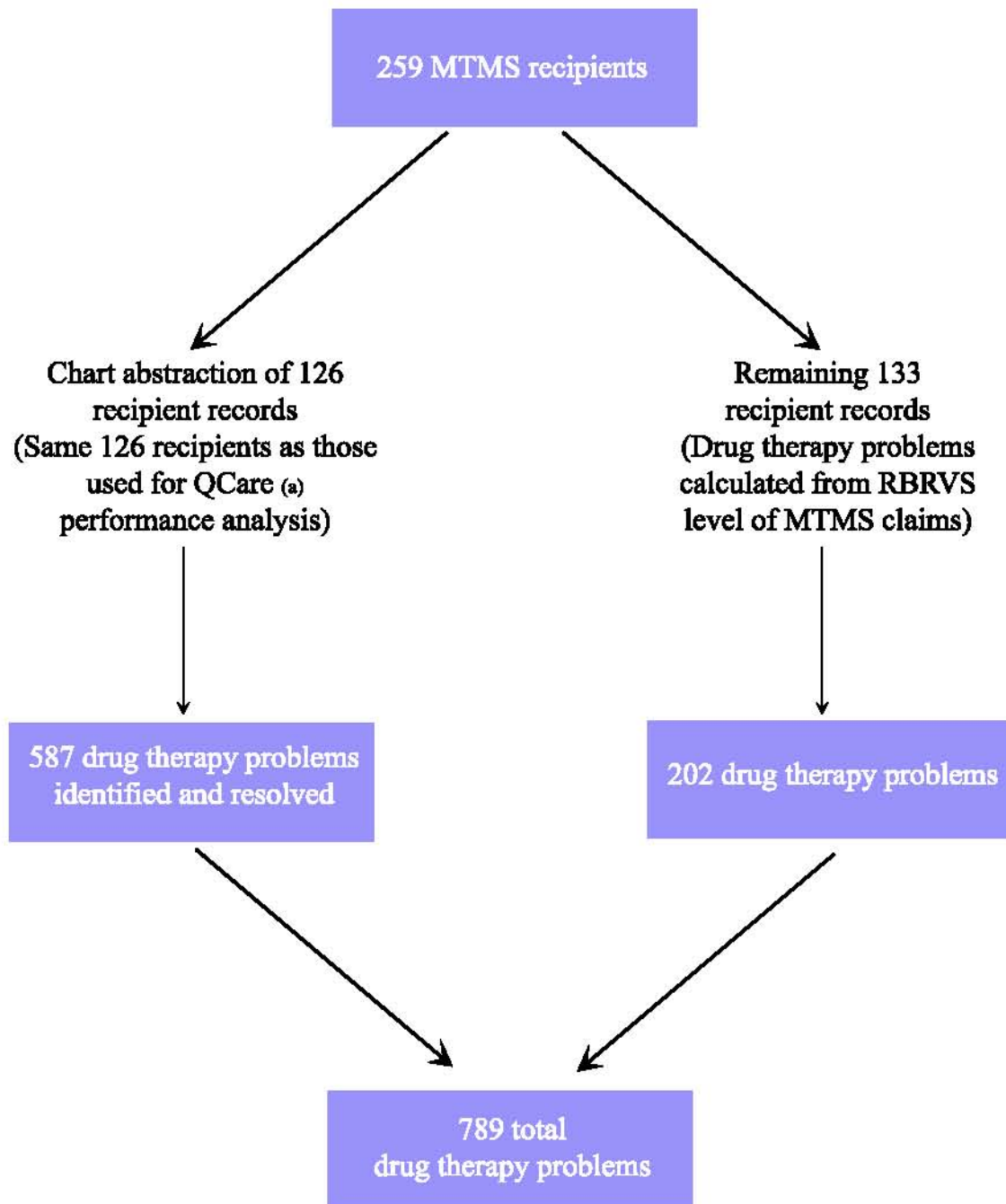
/11 Minnesota population from 2006 U.S. Census Bureau of 5,167,101 less 26.2% persons age 18 and under.

Figure 1: Study Flow Diagram
Evaluation of the Minnesota MTM Care Program



- (a) MA = Medical Assistance; GAMC = General Assistance Medical Care
(b) MTMS = Medication Therapy Management Services
(c) QCare = Quality Care and Rewarding Excellence
(d) FFS = Fee for Service

**Figure 2: Drug Therapy Problem Analysis Flow Diagram
Evaluation of the Minnesota MTM Care Program**



(a) QCare = Quality Care and Rewarding Excellence

Figure 3.
Demographic Distribution of MTMS Recipients

| Race | Count |
|-----------------|--------------|
| Black | 90 |
| White | 125 |
| Asian | 27 |
| Native American | 9 |
| Unknown | 8 |
| TOTAL | 259 |

| Age | Count |
|--------------|--------------|
| 19 and under | 5 |
| 20-29 | 19 |
| 30-39 | 29 |
| 40-49 | 49 |
| 50-59 | 106 |
| 60-69 | 47 |
| 70+ | 4 |
| TOTAL | 259 |
| 64 and under | 250 |
| 65+ | 9 |

| Gender | Count |
|---------------|--------------|
| Male | 92 |
| Female | 167 |
| TOTAL | 259 |

Figure 4. Change in Health Expenditures Before and After MTM Services

% Change in Expenditures

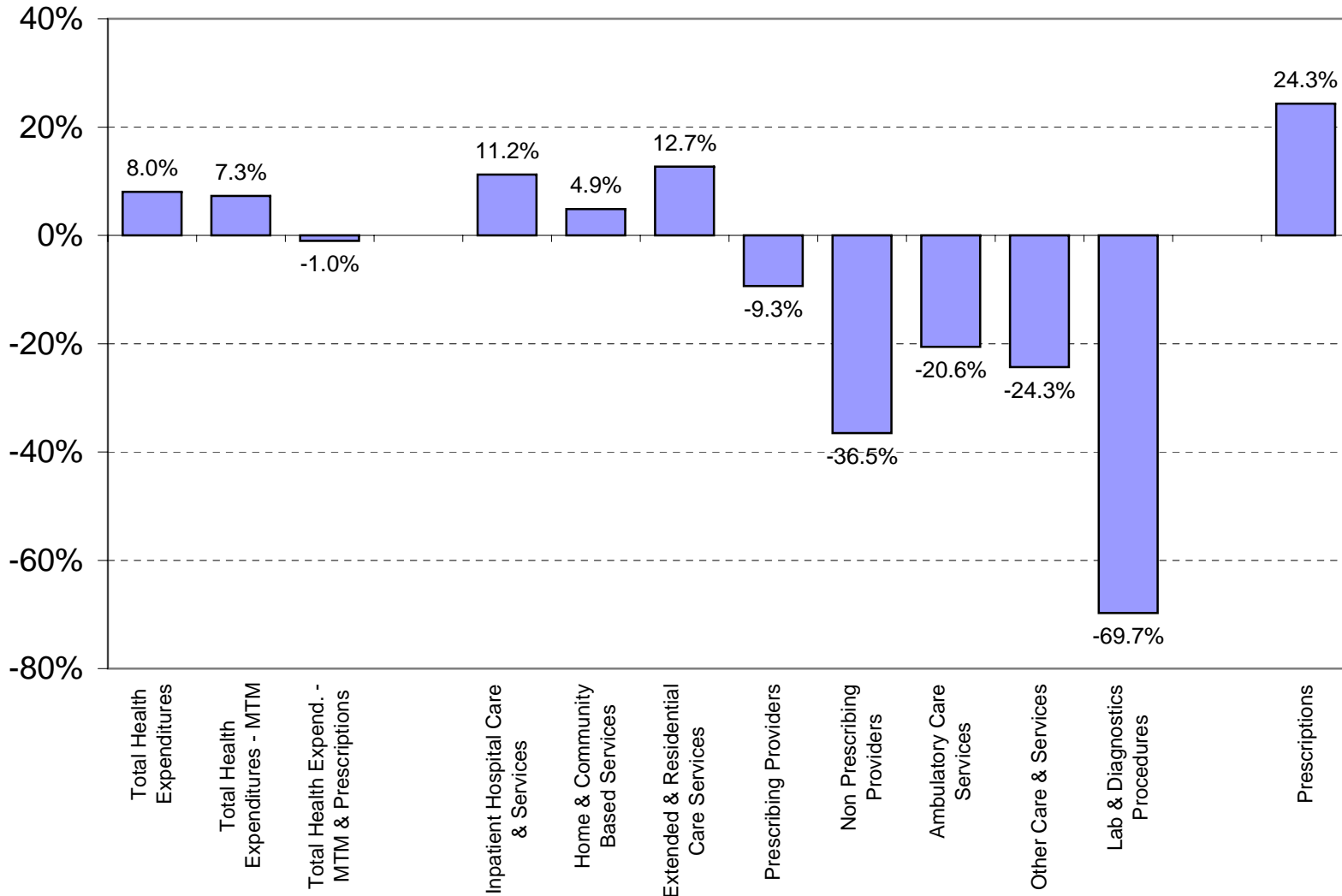
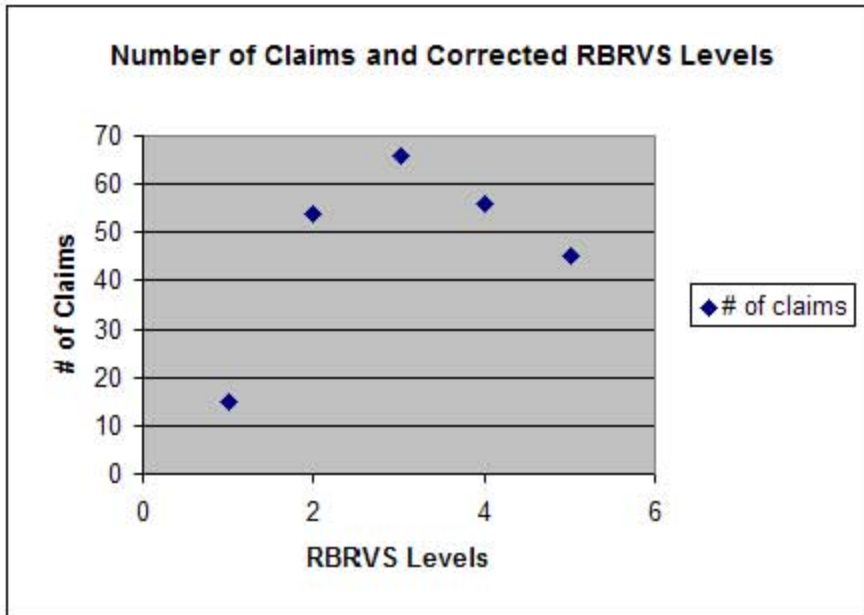


Figure 5.
MTMS RBRVS claims submitted for the 236 claims submitted among 126 records reviewed by chart abstraction

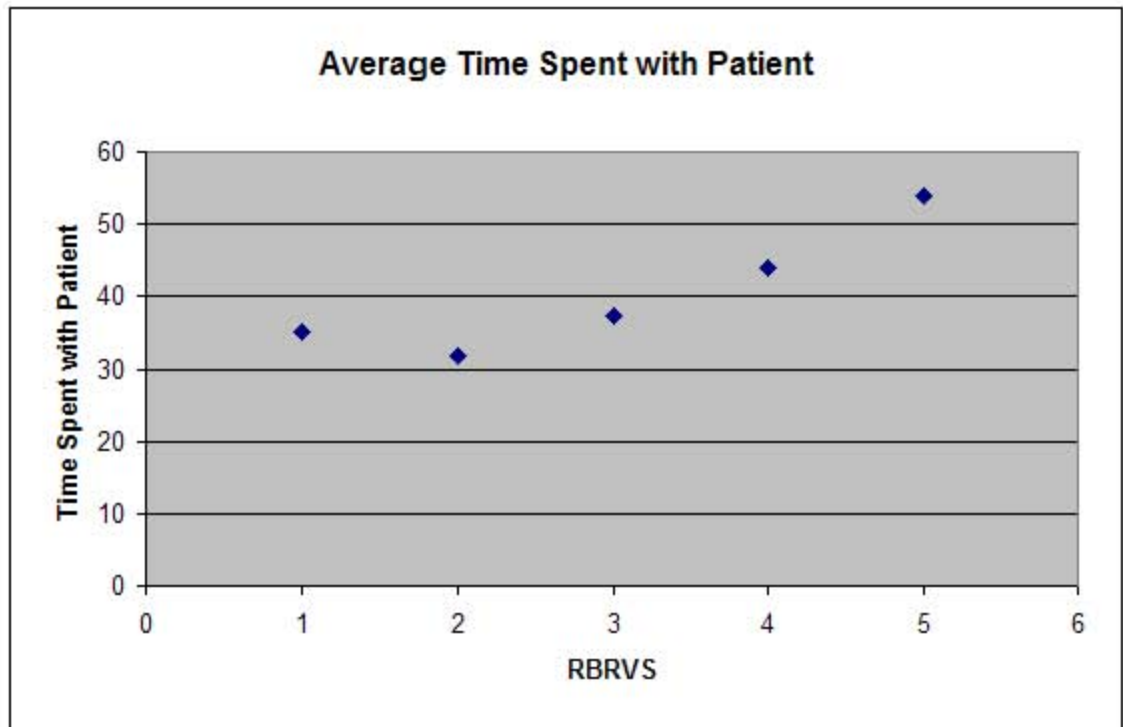
| RBRVS | 1 | 2 | 3 | 4 | 5 |
|-----------------------|----|----|----|----|----|
| # of claims (n = 236) | 15 | 54 | 66 | 56 | 45 |



Claims matching submitted RBRVS – 141/236 (59.7%)
 Number of underreported claims - 72/236 (30.5%)
 Number of over reported claims - 11/ 236 (4.7%)
 Number of over reported claims due to unsubstantiated drug therapy problem
 - 12/236 (5.1%)

Figure 6.
Distribution of time spent with recipients as a function of the submitted RBRVS
MTMS claim reviewed by chart abstraction

| RBRVS | 1 | 2 | 3 | 4 | 5 |
|-------------------------|----|-------|------|------|----|
| Time with Patient | 35 | 31.67 | 37.2 | 44.1 | 54 |
| (n = 224 ^a) | 10 | 51 | 65 | 55 | 43 |



a (n = 224 instances in which the documentation element of, "time spent with patient," was recorded among the 236 MTMS recipient records reviewed by chart abstraction)

Table 1: Minnesota Medicaid Compensation Grid.

| Level | Assessment of Drug-related needs | Identification of Drug Therapy Problems | Complexity-of-Care Planning & FU Evaluation | Approx. Face-to-Face Time | Bill CPT Code | Units | Rate |
|-------|--|---|--|---------------------------|--------------------|---------|----------------------|
| 1 | Problem-focused - at least 1 medication | Problem-focused - 0 drug therapy problems | Straightforward – 1 medical condition | 15 min. | 0115T or 0116T | 1 unit | \$52.00 or \$34.00 |
| 2 | Expanded Problem – at least 2 medications | Expanded Problem – at least 1 drug therapy problem | Straightforward – 1 medical condition | 16-30 min. | 0115T or 0116T | 1 unit | \$76.00 or \$58.00 |
| | | | | | 0117T | 1 unit | |
| 3 | Detailed – at least 3-5 medications | Detailed – at least 2 drug therapy problems | Low complexity at least 2 medical conditions | 31-45 min. | 0115T or 0116T and | 1 unit | \$100.00 or \$82.00 |
| | | | | | 0117T | 2 units | |
| 4 | Expanded Detailed – at least 6-8 medications | Expanded Detailed – at least 3 drug therapy problems | Moderate Complexity – at least 3 medical conditions | 46-60 min. | 0115T or 0116T and | 1 unit | \$124.00 or \$106.00 |
| | | | | | 0117T | 3 units | |
| 5 | Comprehensive - \geq 9 medications | Comprehensive – at least \geq 4 drug therapy problems | High Complexity – at least \geq 4 medical conditions | 60+ min. | 0115T or 0116T and | 1 unit | \$148.00 or \$130.00 |
| | | | | | 0117T | 4 units | |

Example 1: Pharmacist performs MTMS for a new patient with four medications and two medical conditions, and identifies two drug therapy problems. Bill a Level 3 service:

TABLE 2. ICD-9-CM CONDITION CODES LISTED ON RECIPIENTS' FIRST (INITIAL VISIT) MTMS CLAIMS ^a

Top 20 most frequently listed

| ICD-9 Code | Number | |
|------------|--------|--|
| 250 | 98 | Diabetes |
| 401 | 81 | Hypertension |
| 272 | 68 | Hyperlipidemia |
| 311 | 30 | Depression |
| 493 | 26 | Asthma |
| 477 | 25 | Allergic rhinitis |
| 530 | 23 | Esophagitis |
| 300 | 20 | Anxiety |
| 780 | 15 | General symptoms/Alteration of consciousness |
| 269 | 14 | Nutritional deficiencies |
| 244 | 12 | Hypothyroidism |
| 307 | 11 | Special symptoms/Not specified elsewhere |
| 724 | 11 | Unspecified disorders of the back |
| 733 | 11 | Other disorders of bone and cartilage |
| 719 | 10 | Other joint disorders |
| 496 | 8 | Chronic airway obstruction |
| 296 | 6 | Affective psychoses |
| 564 | 6 | Functional digestive disorder |
| 715 | 6 | Osteoarthritis |
| 784 | 6 | Symptoms involving head and neck |

a) Up to four ICD-9 codes can be included in an MTMS claim.

Table 3:
Profile of MTMS Providers During Year One of the Minnesota Medicaid Medication Therapy Management Care Program (4/1/06 – 3/31/07)

| Practitioner Name | Sites of Care | No. of Recipients (Patients) | No. of Encounters (Visits) | No. of Drug Therapy Problems |
|--------------------------|---|-------------------------------------|-----------------------------------|-------------------------------------|
| Schweim, Kelly | Fairview/University Medication Management Clinic - Minneapolis | 36 | 60 | 140 |
| Skoglund, Krissa | Health Partners Specialty Center and Wabasha Clinic - St. Paul | 27 | 54 | 95 |
| Paterson, Nicole | Fairview Ridges Medication Therapy Management - Burnsville | 18 | 40 | 82 |
| Ekstrand, Molly | Fairview Northeast and Ridges Medication Therapy Management | 15 | 41 | 73 |
| Moyer, Lisbeth | Health Partners Midway Clinic - St. Paul | 27 | 34 | 44 |
| Rukavina, Paull | Fairview Highland Park Medication Therapy Management - St. Paul | 12 | 32 | 50 |
| Kilgore, Carolyn | Fairview Hiawatha Medication Therapy Management - Minneapolis | 15 | 29 | 38 |
| Brummel, Amanda | Fairview Crosstown and Uptown Medication Therapy Management | 13 | 23 | 46 |
| Peltier, Amber | Health Partners Riverside Clinic, and Bloomington Clinic | 12 | 17 | 32 |
| Close, Kerry | Fairview Oxboro - Bloomington Medication Therapy Management | 16 | 18 | 20 |
| Groen, Sarah | Health Partners West Clinic, and Bloomington Clinic | 8 | 12 | 20 |
| Schwartzwald, Laura | Medicine Shoppe Pharmacy - Brainerd | 6 | 7 | 21 |
| Scheiner, Shellina | Health Partners Maplewood and Como Clinic - St. Paul | 6 | 6 | 15 |
| Busker, Amy | Fairview Oxboro - Bloomington Medication Therapy Management | 4 | 6 | 18 |
| Iverson, Paul | Iverson Corner Drug - Bemidji | 6 | 8 | 10 |
| Pereira, Chrystian | Smiley's Clinic - Minneapolis | 6 | 6 | 5 |
| Moon, Jean | North Memorial Broadway Clinic - Minneapolis | 4 | 4 | 8 |

| | | | | |
|-------------------------------|--|------------|------------|------------|
| Harris, Ila | Bethesda Clinic – St. Paul | 4 | 5 | 7 |
| Johnson, Michelle | Goodrich Pharmacy - Anoka, St. Francis | 1 | 2 | 9 |
| Eischens, Karla | Iverson Corner Drug - Bemidji | 2 | 2 | 8 |
| Zimmerman, Jodie | Fairview Ridges Medication Therapy Management - Burnsville | 3 | 3 | 5 |
| Mohr, Corinne | Mayo Clinic Pharmacy - Rochester | 2 | 2 | 6 |
| Kreiger, Carrie | Mayo Clinic Eisenberg Pharmacy - Rochester | 2 | 3 | 6 |
| Schlichte, Allison | Fairview Crosstown Medication Therapy Management - Edina | 2 | 3 | 6 |
| Reidt, Shannon | Bethesda Clinic - St. Paul | 2 | 3 | 5 |
| Okerlund, Ryan | Iverson Corner Drug - Bemidji | 2 | 2 | 3 |
| Isetts, Brian | Red Wing Corner Drug - Red Wing | 1 | 2 | 3 |
| Pederson, Jan | Hugo's Family Pharmacy - Thief River Falls | 1 | 1 | 4 |
| Boyko Frandson, Kara | Health Partners Como Clinic - St. Paul | 1 | 1 | 3 |
| Traynor, Andy | Fremont Clinic - Minneapolis | 1 | 1 | 3 |
| Weisenberg, Alan | Cash Wise Pharmacy - Hutchinson | 1 | 1 | 2 |
| Weckwerth, Kristin | Mayo Clinic Pharmacy - Rochester | 1 | 1 | 2 |
| Traynor, Laura | Gateway Clinic - Moose Lake | 1 | 1 | 0 |
| Wix, Kelly | Mayo Clinic Pharmacy - Rochester | 1 | 1 | 0 |
| TOTALS: 34 Pharmacists | | 259 | 431 | 789 |

Table 4.

Summary of Drug Therapy Problems from Desk Review Analysis
(n = 587 drug therapy problems from 126 chart abstracts)

Indication - 139

- Unnecessary drug therapy - 21
 - No valid medical indication - 12
 - Duplicate therapy - 8
 - Treat avoidable adverse reaction - 1
- Need for additional drug therapy - 118
 - Synergistic therapy - 48
 - Untreated condition - 40
 - Preventive therapy - 30

Effectiveness - 221

- Ineffective drug - 47
 - More effective drug available - 43
 - Dosage form inappropriate - 4
- Dosage too low - 174
 - Dose too low - 89
 - Needs additional monitoring - 53
 - Dosage interval too infrequent - 22
 - Incorrect administration - 10

Safety - 90

- Adverse drug reaction - 46
 - Undesirable reaction - 34
 - Unsafe drug for patient - 7
 - Drug interaction - 3
 - Incorrect administration - 2
- Dosage too high - 44
 - Dose is too high - 19
 - Frequency inappropriate - 7
 - Needs additional monitoring - 17
 - Duration of therapy too long - 1

Compliance - 137

- Noncompliance - 137
 - Patient does not understand - 42
 - Patient prefers not to take - 30
 - Patient forgets - 26
 - Drug product not available - 21
 - Cannot afford drug product - 15
 - Cannot swallow/administer - 3

TABLE 5:
Medications and Indications Associated with Unnecessary Drug Therapies (n = 21):

Diabetes (3)

Glipizide – 1, Glyburide – 1, Humalog – 1

Constipation (3)

Senna – 2, Docusate/Senna plus Equate – 1

Depression (2)

Celexa plus Cymbalta – 1, Wellbutrin – 1

Nutritional deficiencies (2)

Vitamin B, Zinc Picolin, Beta Carotene, Multivitamin, Pantothenic – 1
Vitamin C, Vitamin C with rose hips, Vitamin E – 1

Allergic rhinitis (2)

Advair – 1, Niaspan plus Grape seed – 1

Hypertension (1)

Lisinopril plus Prinizide – 1

Hyperlipidemia (1)

Fish oil – 1

Insomnia (1)

Temazepam plus Amitriptyline – 1

Prevent MI/Stroke (1)

Vitamin D – 1

COPD/Emphysema (1)

Advair – 1

Anemia (1)

Ferrous Gluconate - 1

Arthritis (1)

Devils claw plus Alfalfa – 1

Asthma (1)

Sprivia – 1

Pain (1)

Oxycodone plus Fentanyl – 1

**Table 6. Drug Therapy Problems by Chart Abstracts: Medical Indications Involved in Order of Most frequently encountered:
(n= 587 drug therapy problems)**

Diabetes – 250

- Diabetes Mellitus – 211
- NIDDM – 27
- Diabetes with neurological manifestations – 8
- Pre-diabetes – 3
- Disease management - 1

Hyperlipidemia – 60

Hypertension – 44

Depression – 21

- Depression – 18
- Manic depression – 2
- Depressive disorder – 1

Prevent MI/stroke – 21

Pain – 19

- Back pain – 9
- Intermittent/short-term pain – 3
- Pain – 4
- Chronic pain – 1
- Hip pain – 1
- Knee pain - 1

Sleep condition – 16

- Sleep disorder – 10
- Insomnia – 5
- Sleep apnea – 1

Asthma – 15

Osteoporosis – 11

- Osteoporosis prevention – 6
- Osteoporosis treatment – 5

Smoking cessation – 10

HIV – 9

Constipation - 8

GERD – 8

Arthritis – 7

Nutritional deficiencies – 7

Osteoarthritis – 7

Neuropathy - 7

- Neuropathy - 4
- Neuralgia – 2
- Peripheral neuropathy – 1

Headache – 5
 Migraine – 3
 Headache prophylaxis - 2
Heart conditions – 5
 Coronary artery disease - 2
 Angina - 2
 Atrial fibrillation – 1
Infections – 5
 Infection management – 3
 Hepatitis C – 1
 Pneumonia – 1
Allergies – 5
 Allergic rhinitis – 3
 Allergies – 2
Anxiety – 4
Pneumovax – 4
Anemia – 3
Fibromyalgia – 3
Hypothyroidism - 3
Skin conditions – 3
 Contact dermatitis – 1
 Skin problem – 1
 Pruritus – 1
Schizoaffective disorder – 3
Edema – 2
Estrogen replacement – 2
COPD - 2
Microalbuminuria – 2
Other – 2
Renal/kidney management – 2
Crohn’s disease – 1
Irritable bowel syndrome – 1
Diarrhea – 1
Gastritis – 1
Gout – 1
Hyperparathyroidism – 1
Muscle spasm – 1
Nausea/vomiting – 1
Post-traumatic stress disorder – 1
Hepatic encephalopathy – 1
Irritable bowel syndrome – 1
TMJ – 1

TABLE 7.
Quality of Care Performance Benchmark Chart Abstraction Summary

QCare Diabetes

Recipients with Diabetes (n = 81)

A₁C Goals Met – 66/81 (81.5%)

LDL Goals Met – 62/81 (76.5%)

Blood Pressure Goals Met – 74/81 (91.4%)

Aspirin Use Goals Met – 76/81 (93.8%)

No Tobacco Use Goals Met – 56/81 (69.1%)

Number of recipients achieving each criteria level:

Met only 1 of 5 criteria – 1/81 (1.2%)

Met 2/5 criteria – 5/81 (6.2%)

Met 3/5 criteria – 8/81 (9.9%)

Met 4/5 criteria – 36/81 (44.4%)

Met all 5 criteria – 31/81 (38.3%)

QCare Diabetes w/CHD

Recipients with Diabetes and CHD (n = 33)

A₁C Goals Met – 22/33 (66.7%)

LDL Goals Met – 22/33 (66.7%)

Blood Pressure Goals Met – 29/33 (87.9%)

Aspirin Use Goals Met – 29/33 (87.9%)

No Tobacco Use Goals Met – 19/33 (57.6%)

Number of recipients achieving each criteria level:

Met 1/5 criteria – 1/33 (3.0%)

Met 2/5 criteria – 6/33 (18.2%)

Met 3/5 criteria – 6/33 (18.2%)

Met 4/5 criteria – 10/33 (30.3%)

Met all 5 criteria – 10/33 (30.3%)

QCare CHD

Patients with CHD (n = 11)

LDL Goals Met – 2/11 (18.2%)

Blood Pressure Goals Met – 11/11 (100%)

Aspirin Use Goals Met – 4/11 (36.4%)

No Tobacco Use Goals Met – 6/11 (54.5%)

Number of recipients achieving each criteria level:

Met 1/4 criteria - 2

Met 2/4 criteria - 6

Met 3/4 criteria - 3

Met all 4 criteria – 0

Table 8. Health Expenditures Before and After MTM Services

| <i>By Provider type</i> | n = | Pre-Expend. | Post-Expend. | Difference | % Difference | % Distrib. | % Distrib. |
|--|-----|-----------------------|-----------------------|---------------------|--------------|-----------------------|-----------------------|
| | | Mean | Mean | in Expend. | in Expend. | of Expend. | of Expend. |
| | | Pre (-5 mo. to 0 mo.) | Post (1 mo. to 6 mo.) | Post-\$ less Pre-\$ | Diff./Pre-\$ | Pre (-5 mo. to 0 mo.) | Post (1 mo. to 6 mo.) |
| <i>Expenditure per Recipient per Month</i> | | | | | | | |
| Total Health Expenditures | 77 | \$ 3,027.17 | \$ 3,270.80 | \$ 243.63 | 8.0% | 100.0% | 100.0% |
| Total Health Expenditures - MTM | 77 | \$ 3,027.17 | \$ 3,247.65 | \$ 220.48 | 7.3% | 100.0% | 99.3% |
| Total Health Expend. - MTM & Prescriptions | 77 | \$ 2,037.16 | \$ 2,017.00 | \$ (20.15) | -1.0% | 67.3% | 61.7% |
| Inpatient Hospital Care & Services | 77 | \$ 720.05 | \$ 800.79 | \$ 80.74 | 11.2% | 23.8% | 24.5% |
| Home & Community Based Services | 77 | \$ 707.47 | \$ 741.97 | \$ 34.50 | 4.9% | 23.4% | 22.7% |
| Extended & Residential Care Services | 77 | \$ 22.80 | \$ 25.70 | \$ 2.90 | 12.7% | 0.8% | 0.8% |
| Prescribing Providers | 77 | \$ 265.36 | \$ 240.55 | \$ (24.81) | -9.3% | 8.8% | 7.4% |
| Non Prescribing Providers | 77 | \$ 247.10 | \$ 156.89 | \$ (90.21) | -36.5% | 8.2% | 4.8% |
| Ambulatory Care Services | 77 | \$ 13.07 | \$ 10.38 | \$ (2.69) | -20.6% | 0.4% | 0.3% |
| Other Care & Services | 77 | \$ 48.78 | \$ 36.92 | \$ (11.86) | -24.3% | 1.6% | 1.1% |
| Lab & Diagnostics Procedures | 77 | \$ 12.52 | \$ 3.79 | \$ (8.73) | -69.7% | 0.4% | 0.1% |
| Prescriptions | 77 | \$ 990.02 | \$ 1,230.65 | \$ 240.63 | 24.3% | 32.7% | 37.6% |
| MTM Services | 77 | \$ - | \$ 23.15 | \$ 23.15 | 0.0% | 0.0% | 0.7% |
| <i>Total Expenditure for All Recipients</i> | | | | | | | |
| Total Health Expenditures | | \$ 233,092.38 | \$ 251,851.94 | \$ 18,759.56 | 8.0% | 100.0% | 100.0% |
| Total Health Expenditures - MTM | | \$ 233,092.38 | \$ 248,286.84 | \$ 15,194.46 | 6.5% | 100.0% | 98.6% |
| Total Health Expend. - MTM & Prescriptions | | \$ 156,861.07 | \$ 155,309.34 | \$ (1,551.73) | -1.0% | 67.3% | 61.7% |
| Inpatient Hospital Care & Services | 77 | \$ 55,443.76 | \$ 61,660.96 | \$ 6,217.20 | 11.2% | 23.8% | 24.5% |
| Home & Community Based Services | 77 | \$ 54,475.30 | \$ 57,132.00 | \$ 2,656.70 | 4.9% | 23.4% | 22.7% |
| Extended & Residential Care Services | 77 | \$ 1,755.85 | \$ 1,979.14 | \$ 223.29 | 12.7% | 0.8% | 0.8% |
| Prescribing Providers | 77 | \$ 20,433.02 | \$ 18,522.63 | \$ (1,910.38) | -9.3% | 8.8% | 7.4% |
| Non Prescribing Providers | 77 | \$ 19,026.33 | \$ 12,080.50 | \$ (6,945.83) | -36.5% | 8.2% | 4.8% |
| Ambulatory Care Services | 77 | \$ 1,006.45 | \$ 799.21 | \$ (207.24) | -20.6% | 0.4% | 0.3% |
| Other Care & Services | 77 | \$ 3,756.17 | \$ 2,842.99 | \$ (913.18) | -24.3% | 1.6% | 1.1% |
| Lab & Diagnostics Procedures | 77 | \$ 964.19 | \$ 291.91 | \$ (672.28) | -69.7% | 0.4% | 0.1% |
| Prescriptions | 77 | \$ 76,231.31 | \$ 94,760.05 | \$ 18,528.74 | 24.3% | 32.7% | 37.6% |
| MTM Services | 77 | \$ - | \$ 1,782.55 | \$ 1,782.55 | 0.0% | 0.0% | 0.7% |

TABLE 9: MTMS Provider Self-assessment Responses

Response rate: 80% (24/30 responses)

1. Use of electronic medical record - 22/24 (91.7%)
 - 16 using Assurance
 - 5 using EPIC
 - 3 using Allscripts
 - 1 using Practice Partner
2. Current/resolved medical conditions – 24/24 (100%)
3. Drug allergies – 24/24 (100%)
4. Physician contact information – 24/24 (100%)
5. Date of visit/time spent with patient – 24/24 (100%)
6. Time spent with patient - 100%
7. List of all drugs - 100%
8. Doses/directions/uses - 100%
9. Medical devices - 19/24 (79.2%)
10. Alcohol/Tobacco use - 100%
11. Environmental factors - 17/24 (70.8%)
12. Assessment of Drug Therapy Problems - 100%
13. Written care plan - 23/24 (95.8%)
14. Information delivered to patient - 100%
15. Use of an appointment scheduling system - 23/24 (95.8%)
16. Use of patient consent to treatment (HIPAA) forms - 20/24 (83.3%)
17. Use of a claims reconciliation process - 23/24 (95.8%)
18. Use of collaborative practice agreements - 17/24 (70.8%)
 - 12 for Diabetes
 - 8 for Lipids
 - 6 for HTN
 - 6 for Asthma
 - 5 for Smoking Cessation
 - 4 for Anticoagulation
 - 2 for COPD
 - 1 for Anemia
 - 1 for GERD
 - 1 for therapeutic interchange protocol
 - 1 with a universal collaborative practice agreement
19. Prescriber communications - 14/24 (58.3%)

Twelve respondents communicate with physicians mainly through the electronic medical record. Two respondents stated that mainly use cover letters.
20. Marketing material - 14/24 (58.3%)

Brochures, posters, articles.

TABLE 10: Documentation Analysis by Chart Abstraction

Comparison of Chart Abstracts to MTMS Statutory and Regulatory Requirements
Chart Abstraction Data (n = 126 records)

1. Use of an electronic medical record – 126/126 (100%)
2. List of current and resolved conditions – 104/126 (82.4%)
3. List of drug allergies – 126/126 (100%)
4. Physician contact information – 124/126 (98.4%)
5. Date of visit 126/126 (100%)
6. Time spent with patient – 123/126 (97.6%)
- 7a. List of drugs in use by patient – 118/126 (93.7%)
- 7b. Drugs linked with corresponding indications for use – 75/126 (59.5%)
8. Doses/directions of medications – 126/126 (100%)
9. Medical devices – 92/126 (73.0%)
- 10a. Alcohol Use – 114/126 (90.5%)
- 10b. Tobacco Use– 117/126 (92.9%)
11. Environmental Factors – 126/126 (100%)
12. Drug Therapy Problems – 126/126 (100%)
13. Care Plan Description – 126/126 (100%)
14. Instructions to Patient – 126/126 (100%)