Implementation of the

Pharmaceutical Case Management Model

in a Private Sector Health Plan

Final Report Presented to
The Community Pharmacy Foundation

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3 Executive Summary

3.1 Background

Pharmaceutical case management (PCM) is a model of care which was initially implemented for Iowa Medicaid beneficiaries in 2000 through funds appropriated by the state legislature. PCM is a robust medication therapy management program that provides collaborative care to patients at high risk for experiencing adverse events from their medications. In 2000, PCM was an innovative model of care delivered by pharmacists in the community setting. Almost 10 years later, PCM is still a strong program provided by pharmacists across Iowa. Pharmacists providing these services receive monetary compensation for PCM provided to eligible patients. PCM patients must meet the eligibility criteria of taking four or more scheduled, non-topical, prescription medications and must have at least two of the following chronic conditions: congestive heart failure, ischemic heart disease, diabetes mellitus, hypertension, hyperlipidemia, asthma, depression, atrial fibrillation, osteoarthritis, gastroesophageal reflux disease, peptic ulcer disease, and chronic obstructive pulmonary disease. Also, they cannot reside in a nursing home.

PCM achieved success in the Iowa Medicaid program by significantly improving medication safety.[1] Other states, including Missouri and Minnesota, have implemented Medicaid medication therapy management programs modeled after Iowa Medicaid PCM. Through partnership with Wellmark Blue Cross and Blue Shield (Wellmark), the Iowa Farm Bureau Federation (Farm Bureau), the University of Iowa College of Pharmacy, and funding from the Community Pharmacy Foundation, an 18 month pilot project was conducted to determine the benefits of implementing PCM in a private sector health plan. The PCM model of care in this pilot project remained the same as Iowa Medicaid PCM service types and frequencies. Differences between Iowa Medicaid PCM and the

private sector pilot project include reimbursement (only pharmacists are eligible for reimbursement, whereas physicians and pharmacists are eligible for reimbursement in the Medicaid program), as well as additional collaboration with case managers and disease managers through Wellmark. The primary objectives of this pilot project were to 1) describe the effect of PCM on the appropriateness of medication for people in a private insurance group, 2) characterize the drug-related problems (DRPs) identified by pharmacists performing PCM services, 3) compare health care utilization among people eligible for the PCM service, 4) assess the effect of PCM on patients' self reported health status, and 5) assess pharmacist barriers to delivering PCM services.

3.2 Findings

Significant findings include:

1. Private sector patients meeting the same eligibility criteria as Medicaid patients had higher levels of health:
   - ✓ Patients' baseline medication appropriateness index (MAI) scores were 0.3 whereas baseline MAI scores in Medicaid beneficiaries were 9.6.
   - ✓ Patients were 58.7 years old and were taking 4.7 medications on average whereas Medicaid beneficiaries were 52.5 years old and taking 7.5 medications on average.
   - ✓ Subjectively, feedback from pharmacists participating in the pilot project revealed a lower perceived need by the pharmacists for eligible patients to receive PCM services.
2. Pharmacists encountered several barriers to providing PCM services to eligible private sector patients:
   - ✓ Patients overall health was higher, patients did not perceive need for service.
   - ✓ 50% of pharmacies (43) had fewer than 5 eligible patients.

3. PCM had a weak effect on health care utilization, which may be related to the relatively low level of medication inappropriateness.
    - ✓ Patients receiving PCM services showed a significant increase in the number of prescription medications; however a corresponding increase in cost of medications was not shown.
4. PCM services provided an important, unique service to eligible private sector patients.
    - ✓ On average, almost three DRPs per patient were identified by pharmacists over the 18 month pilot period.
    - ✓ 89.3% of the identified drug therapy problems were resolved.

3.3 Recommendations

As medication therapy management (MTM) services continue to grow, PCM will meet a growing demand in the health care marketplace. PCM is a robust program providing comprehensive medication services throughout the year. Additionally, PCM serves to reduce overall health care costs and health care utilization. IPA should continue to educate pharmacists on the opportunities to provide PCM and other MTM programs to eligible patients in Iowa. IPA, large employers, and the profession of pharmacy should consider the barriers to implementing PCM in community pharmacy settings and evaluate the survey findings further, while taking alternative service delivery models into consideration. Additionally, future study of eligibility criteria should be considered for PCM and other MTM services. Although the study evaluation for this program suggested a limited need for PCM due to a relatively low level of medication inappropriateness, value was demonstrated by pharmacists identifying, on average, just under three DRPs per patient.

The project coordinators recommend implementation of PCM services as a continued benefit within Farm Bureau to patients with Wellmark coverage.

3.4 Conclusion

The implementation of PCM in a private sector health plan provided value to the eligible patients who received the service. This program also demonstrated the need for further assessment of community pharmacy practice and incorporation of PCM services at these sites. Future study on eligibility criteria for medication therapy management services, such as PCM will be important as the profession of pharmacy moves toward MTM standards.

4 Background

Implementation of PCM in a private sector health plan required building relationships with all project partners. IPA worked with the Iowa Farm Bureau Federation (Farm Bureau), a 100,000 member, private sector healthcare purchaser, who coordinates benefits through Iowa's largest insurer, Wellmark Blue Cross/Blue Shield (Wellmark) of Iowa. For the project evaluation, IPA worked with the University of Iowa.

The PCM model of care was operationalized in the Iowa Medicaid program in 2000 through funds appropriated by the state legislature. This model of care facilitates a cooperative relationship between pharmacists and physicians to manage patients at a high risk for experiencing medication related problems. Additional collaborations took place during this pilot project with disease managers and case managers already being utilized by Wellmark for eligible patients.

Most PCM program features were left unchanged during this 18 month pilot project. Pharmacist and pharmacy eligibility, as well as clinical patient eligibility requirements remained the same. One new eligibility criteria for this pilot project was the requirement for eligible patients to receive 50% or greater of their prescription medications from a PCM providing pharmacy. PCM service types, frequencies, and reimbursements also remained the same. One difference between the Medicaid PCM program and the private sector pilot was that only pharmacists were eligible for reimbursement in the pilot, whereas both pharmacists and physicians can file claims and be reimbursed for care provided in the Medicaid PCM program.

The need for expanding PCM services into the private sector has been demonstrated through slow uptake of medication therapy management programs through Medicare Part D and other payers, despite the success of PCM in Iowa Medicaid and other state Medicaid programs. Following the implementation of PCM in Iowa Medicaid, a complete

evaluation was submitted to the Iowa legislature as well as published in the *Journal of the American Pharmacists Association*.[1] This research provides solid evidence that PCM positively impacted the health status of Medicaid patients receiving the service.

The following summarizes the researchers' conclusions:

A. The PCM program significantly improved medication safety.

1. Statistically significant 12.5% improvement in the Medication Appropriateness Index was found in PCM patients compared to similar patients not receiving PCM. Improvement was documented in all 10 domains with statistical significance in 8 domains.
2. Statistically significant 24% decrease in use of medications considered to be inappropriate in the elderly (Beers criteria) was found in PCM patients over 60 years of age compared to their peers not receiving PCM.

B. Medication-related problems in these patients pose a significant public health risk as documented by:

1. SF 36 Physical Health Summary
2. SF 36 Mental Health Summary
3. Self-Reported Adverse Drug Reactions: PCM patients reported a three times higher rate than other elderly Iowans not on Medicaid
4. Drug-Drug Interaction Rate

C. Many patients received PCM services despite the implementation issues associated with a new program.

1. During the research, 943 patients received PCM services.
2. Pharmacists detected 2.6 medication-related problems per patient and made 3.8 recommendations per patient.
3. The most common recommendation was to start a new medication (52% of patients), followed by a medication change (36%) and medication discontinuation (33%).
4. Pharmacies serving the largest number of patients achieved the greatest improvements in care.

D. In the nine months of financial data studied, the short-term cost impact of PCM was budget neutral despite the cost of providing PCM services.

1. Pharmacies serving the largest number of patients documented a trend toward decreased ER and outpatient facility use. This was a secondary finding of the research and not statistically significant due to inadequate power.

5 Program Description

Pharmacies were considered PCM providers if they had applied and been approved for providing PCM services prior to the start date of the pilot project. PCM providing pharmacies have a pharmacist on staff eligible and trained to provide PCM services. Patients were considered eligible if they met the following clinical criteria: diagnoses with two of the following twelve disease states (congestive heart failure, ischemic heart disease, diabetes mellitus, hypertension, hyperlipidemia, asthma, depression, atrial fibrillation, osteoarthritis, gastroesophageal reflux disease, peptic ulcer disease, and chronic obstructive pulmonary disease); received regular prescriptions for at least four scheduled, non-topical medications; and did not reside in a nursing home. Additionally, patients were only eligible if their 'primary pharmacy' was a PCM providing pharmacy. For this pilot project, 'primary pharmacy' was defined as a pharmacy where 50% or greater of a patient's prescriptions were filled.

Although pharmacists participating in the pilot project were required to have previous experience as a PCM provider, an additional web-cast training was conducted in January 2006, to provide new information on program differences as well as review details of the PCM model of care. (Appendix A). The PCM model of care and reimbursement structure remained the same and was as follows:

Service Type	**Reimbursement**	**Maximum # of Payments**
Initial Assessment	$75	One per patient
Problem Follow-up Assessment	$40	Four per patient per 12 months
New Problem Assessment	$40	Two per patient per 12 months
Preventative Follow-up Assessment	$25	One per patient per 6 months

Pharmacies were required to sign a Business Associate Agreement with the Iowa Pharmacy Association for the protection of sharing patient specific information with IPA.

(Appendix B) IPA was also required to sign a Business Associate Agreement with Wellmark. IPA's role as the project administrator required IPA to collect submitted claims through the IPA website and process payments to pharmacies for PCM services provided.

In December 2005, IPA communicated with all PCM providers alerting them of the upcoming opportunity to be involved with the private sector PCM pilot project. Following approval from Wellmark's legal department, Wellmark extracted the data for eligible patients based on ICD-9 codes for diagnoses and prescription dispensing claims. This patient list was cross-walked with the list of PCM providing pharmacies to determine clinically eligible patients whose primary pharmacy was a PCM provider. In January 2006, PCM providers were notified of eligible patients from their pharmacies. Pharmacies were asked to 'accept' patients into their PCM program based on that pharmacy's capability to provide PCM services. Following pharmacies' acceptance or declination of patients into their PCM programs, 203 patients were 'accepted' at 55 pharmacies. The main reasons for pharmacists choosing to not accept patients included workforce issues and patient refusal. Workforce was a common issue voiced by many pharmacies, and the timing of the pilot project implementation overlapped with the introduction of Medicare Part D. The Farm Bureau PCM pilot project began on February 1, 2006, while Medicare Part D rolled out January 1, 2006. Patient refusal was a common issue, and pharmacists noted that patients were 'healthier' (compared to PCM eligible Medicaid patients) and didn't perceive a need for PCM services. Due to this common occurrence, the data set was reviewed and an error was discovered. In pulling prescription drug claims, NDC numbers were searched erroneously instead of searching for 4 unique AHFS drug codes. Therefore, a patient changing between brand and generic medications, two or more generics, or drugs within the same class were identified as eligible. After a second initial data pull (the first with incorrect drug codes),

480 patients were identified at 86 PCM providing pharmacies. The second data pull executed correctly in March 2006 identified 111 patients that were incorrectly identified as eligible to receive PCM services. After these two data pulls, 203 patients at 55 pharmacies were 'accepted' into the pilot project. Additionally in March 2007, a six month project extension was granted which yielded 132 new eligible patients. In total, 83 patients received PCM services at 29 pharmacies between February 1, 2006, and July 31, 2007.

Eligible patients received notice from Farm Bureau (Appendix C), and pharmacists received sample telephone and written scripts to utilize when contacting patients to inform them of the opportunity to receive PCM. Pharmacists then scheduled an appointment with the patient to conduct an "initial assessment." Because the error in the initial data pull was not identified before communication was sent out to accepted patients, 80 of the patients accepted into the program did not actually meet the eligibility criteria. Pharmacist feedback from telephone interviews after the first 2 months of the pilot project are contained in Appendix D. Six eligible pharmacies were assigned zero patients, and an additional 5-10 pharmacies voiced a desire for additional eligible patients.

PCM Model of Care

During the initial assessment, the pharmacist:

- ✓ Takes a medication history;
- ✓ Determines the indication for each medication and records progress toward achieving treatment goals;
- ✓ Assesses patient compliance;
- ✓ Detects any side effects or side effect risks that can be reduced (e.g., by changing dose, choosing lower risk medications, or using particular monitoring procedures);

- ✓ Assesses the need for regimen change, patient self-management education, and for administration and monitoring device training; and
- ✓ Makes recommendations to the physician about an action plan the team should consider and about preferred follow-up methods and frequency.
- ✓ The action plan may include a variety of activities based on the patient's needs and conditions. These activities may include:
    - Changes in medication regimen
    - Focused patient or caregiver education;
    - Periodic assessment for changes in the patient's condition;
    - Periodic monitoring of the effectiveness of medication therapy;
    - Patient self-management training;
    - Provision of patient-specific educational and informational materials;
    - Compliance enhancement; and
    - Reinforcement of healthy lifestyles.

The physician and pharmacist will finalize the action plan by approving or modifying the action plan proposed by the pharmacist. After the team agrees upon an action plan, the action plan is implemented and a "follow-up assessment" is scheduled with the pharmacist at the interval agreed upon by the team.

During the follow-up assessment, the pharmacist will assess progress toward achieving the objectives of the action plan and update the action plan as necessary. The pharmacist will communicate with the physician about any further action that may be needed and when the pharmacist should see the patient for additional follow-up. The physician and pharmacist will finalize a new action plan by approving or adjusting the modifications to the action plan proposed by the pharmacist.

During usual care of the patient as new medications are prescribed or medications are adjusted, new medication problems may arise. The "new problem assessment" is the

mechanism by which the pharmacist/physician patient assessment cycle of the PCM program can be reinitiated prior to an originally scheduled follow-up. This process allows for continual patient monitoring for medication-related issues. During the new problem assessment, the pharmacist will:

- ✓ Review the patient's medication history for changes;
- ✓ Identify any aspects of the new or adjusted medication that increases risk of side effects, compliance problems, or difficulty achieving treatment goals; and
- ✓ Make recommendations to the physician about an action plan the team should consider and about preferred follow-up methods and frequency.

If no active medication problems are identified, the pharmacist will schedule a six-month "preventative assessment" with the patient. This allows for periodic review of this high-risk patient's medication therapy. During the preventative follow-up assessment, the pharmacist will:

- ✓ Update the medication history;
- ✓ Assess patient compliance;
- ✓ Assess progress toward achieving treatment goals;
- ✓ Reinforce desired self-management behaviors;
- ✓ Detect new risk factors;
- ✓ Assess the need for regimen change and new patient education; and
- ✓ Make recommendations to the physician about an action plan the team should consider and follow-up methods and frequency.

Disease State Management and Case Management Collaboration

Prior to the pilot project start date, concern was raised by Wellmark and Farm Bureau as to the duplication of PCM services with pre-existing case management and disease state management services already provided to eligible patients. To clarify this

issue, IPA hosted a meeting in November 2005 with two PCM pharmacists, three Wellmark case managers, and members of the disease management team. During this meeting, PCM pharmacists explained their role and described how PCM services can augment disease management and case management programs. It was explained some overlap may occur when discussing disease states and lifestyle modifications, but PCM primarily focuses on medication management. Primary outcomes from the meeting included: education of providers as to details of PCM services, case management and disease management services; inclusion of 'flags' on patient records indicating PCM eligible, disease management (DM) eligible, or complex case management (CM) eligible. These flags would prompt providers (pharmacists, case mangers, and disease managers) to discuss the uniqueness of care they are providing. Pharmacists received an Excel spreadsheet page with eligible patients and personal information (date of birth, address, phone number, and primary pharmacy); the final two columns on this spreadsheet were checked 'x' in columns for DM or CM if patients were enrolled. DM and CM providers accessed patients through Wellmark's electronic records. Prompts were entered to alert CM and DM providers if a patient was enrolled in the PCM pilot project. PCM training provided to pharmacists in January 2006 highlighted the opportunity to collaborate with CM and DM providers to improve patient care.

When meeting with an eligible patient with a DM flag, PCM pharmacists were instructed to inform patients the service they were providing focuses on improving medication use and outcomes, and was different than the phone call they receive from a nurse and does not replace the printed materials they receive in the mail. PCM, DM, and CM providers all recognized that some information may be duplicated, but having patients hear information more than once (ie – lifestyle change) from more than one provider is positive reinforcement. Disease managers also received notification of

patients' charts carrying a PCM flag. They were instructed to ask these patients if they had met with a pharmacist to discuss their medication use and appropriateness. Pharmacists were also encouraged to refer patients into DM or CM programs if felt the services needed by a patient were outside of the scope of PCM.

Of the 480 patients identified as eligible patients in the PCM program, 161 (33.5%) were also enrolled in Wellmark's disease management program. Of the 203 accepted patients, 70 (34.5%) were enrolled in DM, and of the 83 patients who received PCM services, 41 (49.4%) were enrolled in DM. At the onset of the pilot project, Wellmark contracted with American Healthways for DM services. In March 2007, Wellmark changed DM providers to Matria. This change had a relatively small impact on the PCM pilot project as it was nearing completion. However, Matria clinicians were not educated on the PCM program and patient charts were no longer flagged.

During the initial meeting of PCM, DM, and CM providers; and at monthly team member project meetings, the collaboration of PCM and CM was discussed as an opportunity for providers to work together and improve care. Only 5 accepted patients in the PCM pilot (n= 203) were also eligible for case management services. These patients were traditionally of higher need and faced issues such as diagnoses associated with catastrophic events; progressive neuromuscular diseases, organ transplant, head and spinal injuries, or patients with chronic diagnoses experiencing frequent hospitalization and/or emergency room visits. Due to a small number of patients, robust collaboration was not experienced in this subgroup of patients. One patient passed away, one patient's coverage expired, and two were not provided PCM services. For one collaborative PCM/CM patient, a conference call was held on May 4, 2006, between the pharmacist and case manager. IPA staff participated on the call to document the collaboration. Although only one PCM/CM collaboration occurred, both the pharmacist

and case manager gave feedback that this was a positive intervention that improved their knowledge and ability to care for their mutual patient.

PCM Documentation and Billing

Another difference between the Iowa Medicaid PCM program and the private sector pilot project was the billing method and payment model. Documentation for PCM services is completed via the preferred method of the PCM provider. Some pharmacists document PCM electronically and save the files to CDs or computers, while others utilize paper charts. All pharmacists must thoroughly document the PCM services they provide as well as the communication they submit and receive from patients' physicians.

A web-based claims system was designed by IPA and QCI (Quality Consultants, Inc), IPA's web design company. From the IPA website, a link was provided for Wellmark/Farm Bureau PCM. To enter this site, users were required to enter a unique username and password. IPA assigned every participating pharmacist a username (IA pharmacist license number) and password (random alpha-numeric combination). Upon logging in to the Wellmark/Farm Bureau PCM page, the pharmacist completed an electronic claim by selecting the patient (from a drop down list specific to the user's pharmacy); selecting the type of PCM assessment (initial, problem follow up, new problem, or preventative follow up); date of assessment; estimated date of next encounter; completing two health status questions; and listing drug therapy problems and the status of each drug therapy problem.

Patient reported health status and drug therapy problem information was collected on the electronic claims for the purpose of completing the project evaluation. The two health status questions which PCM providers were trained to ask patients at each visit were: 1) Overall, how would you rate your health in the past month? 2) Overall, how would you rate your health in the past month compared to others your age? Patients

could respond Excellent, Very Good, Good, Fair, or Poor. Drug Therapy Problem type (unnecessary drug therapy, wrong dose, dosage too low, dosage too high, adverse drug reaction, inappropriate compliance, or need additional drug therapy), the associated medication and problem, and the status (resolved, pending, unresolved) were collected on the electronic claim form as well. The task of data entry could also be delegated to pharmacy technicians. The online claim forms did not replace PCM service documentation and care notes. Pharmacists were required to maintain separate documentation. In addition to claim forms on the IPA Wellmark/Farm Bureau PCM website, additional tools and study documents were made available. These included:

- ✓ Wellmark formulary link
- ✓ Fax to Physician cover letter (to print on pharmacy's letterhead) (Appendix E)
- ✓ Case Management / Disease Management Referral form (Appendix F)
- ✓ Optional Claims and Data Form (mirrored information collected online) (Appendix G)
- ✓ Optional Medication History Form (Appendix H)
- ✓ Sample Letter (To: patient/ From: pharmacist) (Appendix I)
- ✓ Sample Telephone Script (Appendix J)
- ✓ Farm Bureau PCM Training Handout (Appendix A)
- ✓ Optional PCM Fax Communication Form Between Providers (Appendix K)

Pilot Project Timeline

The 18 month pilot project for implementing PCM in a private sector health plan took place from February 1, 2006, through July 31, 2007. The pilot project was originally scheduled to last twelve months but was extended to 18 months due to low volume of claims and slow uptake of the program in February 2006. The most significant reason for slow uptake identified by pharmacists participating in the program was the start date of February 1, 2006, fell exactly one month after the implementation of Medicare Part D.

Because the criteria stipulated participating pharmacists must be working in a community (dispensing) pharmacy; all pharmacists involved in this project were challenged to educate themselves and their patients on the largest change to Medicare since its inception, while being asked to implement an additional patient care program at the same time.

Monthly Team Member Project Meetings

Project team members from IPA, Wellmark, Farm Bureau, and the University of Iowa conducted monthly meetings from February, 2006 to September, 2007. Meeting minutes are attached as Appendix L.

6 Program Objectives

From the initial grant submitted to the Community Pharmacy Foundation in September, 2004, the Business Plan (Appendix M) included six goals (A-F).

6.1 Goal A: Finalize business relationship with partners

IPA completed negotiations regarding contract parameters between Farm Bureau, Wellmark, and the University of Iowa to finalize each party's responsibilities. IPA was responsible for program oversight and administration, communication and training to participating pharmacists, and pharmacist payment pursuant to submitted claims. Farm Bureau was responsible for member communications and attendance at monthly meetings. Farm Bureau facilities were also used to host the online webcast training for pharmacists. Wellmark was responsible for generating data of Farm Bureau members that were eligible at PCM pharmacies. Wellmark was also responsible for generating prescription claim and medical service claim data for evaluation of medication appropriateness index and health care utilization in the study population. Bill Doucette, Professor, University of Iowa, College of Pharmacy, Division of Clinical and Administrative Pharmacy, completed the data evaluation from the pilot project. All project partners signed Business Associate Agreements outlining participation in the project.

6.2 Goal B: Establish evaluation methodology

The objectives of the project evaluation were (1) to describe the effect of PCM on medication appropriateness index (MAI), (2) to characterize the drug-related problems (DRPs) identified by pharmacists performing PCM services, (3) to compare health care utilization among people eligible for the PCM service (those who received PCM vs. those who did not), (4) determine eligible patients' self reported health status, and (5) to assess pharmacist barriers to delivering PCM services.

The data set generated from Wellmark included hospital, medical, and prescription drug claims from 1/1/05 to 7/31/07. The timeliness of data extractions provided by Wellmark proved to be a barrier to the project evaluation. Due to delays within Wellmark's legal department, the project evaluator waited 6 months from the anticipated date of receipt before study data was obtained. (projected date September 2007, actual date of data receipt March 2008) Additional data secured for the project evaluation came from IPA's website. This claim data included pharmacy, pharmacist, and patient name; assessment type and date; patient responses to two health status questions; and minimal information related to drug therapy problems. For DTPs, pharmacists could select unnecessary drug therapy, wrong dose, dosage too high, dosage too low, adverse drug reaction, inappropriate compliance, need additional drug therapy, or none. Brief explanations could be entered online, and pharmacists could select resolved, unresolved, or pending, as the DTP status. Lastly, pharmacists were asked to submit the following information for patients enrolled in the project: a printout of the patient's dispensing history from November 1, 2005 to July 31, 2007 and the patient's clinical chart. This information was de-identified by the pharmacist submitting the paperwork, or by a student pharmacist assisting with the project. Pharmacists were reimbursed $25/per patient upon receipt of project paperwork to the primary investigator.

6.3 Goal C: Operationalize PCM services

The PCM provider network was established through contacting the existing list of PCM providers for Iowa Medicaid through multiple mechanisms. The list was developed from IPA's database and the Medicaid PCM provider database. The initial list contained 181 PCM providers and 115 PCM pharmacies. Approximately 70% of counties had access to a PCM pharmacy. Pharmacists on this list were notified via fax (Appendix N), via email, and in the IPA *Journal* and *e-Rx newsletter*. This existing provider network

was shared with Wellmark to crosswalk with the list of eligible patients pulled from the data. For patients to be eligible, clinical criteria had to be met and greater than 50% of prescriptions had to be dispensed from a PCM pharmacy. Pharmacies also had to sign Business Association Agreements. Seven pharmacies that signed BAAs had zero eligible patients at their pharmacy. From the initial list of eligible patients, 83 patients received PCM services during the 18 month pilot period.

Pharmacists documented several reasons for low uptake of PCM services during this pilot project. The results of a 6 month follow up fax/telephone survey are attached as Appendix O. There were pharmacists that declined participation due to: bad timing (Medicare Part D implementation); too busy; short staffed; and too few eligible patients. There were also patients that declined participation because they felt it was unnecessary. In one community patients declined participation due to physician concern.

Farm Bureau members and Wellmark policyholders were notified of the PCM pilot program through Farm Bureau's *Spokesman* (Appendix P) and Wellmark's *Blue* (Appendix Q) print publications. IPA also conducted a press release at the American Pharmacists Association 2006 Annual Meeting.

6.4 Goal D: Maintain successful PCM operations

During the 18 month pilot program, service provision of PCM services remained mostly consistent and averaged approximately 10 claims per month. IPA continuously reached out to pharmacists via fax communication, emails, printed articles, and personalized phone calls. Communications strongly encouraged pharmacists to take advantage of the opportunity to provide PCM to patients enrolled in a private sector health plan. Tables 6.4a and 6.4b depict PCM claim summaries by month and by participating pharmacy. Table 6.4c shows average

PCM claims per patient by pharmacy. Lastly, Table 6.4d shows PCM assessment types per patient.

Table 6.4a - Pharmacy PCM Claims by Month

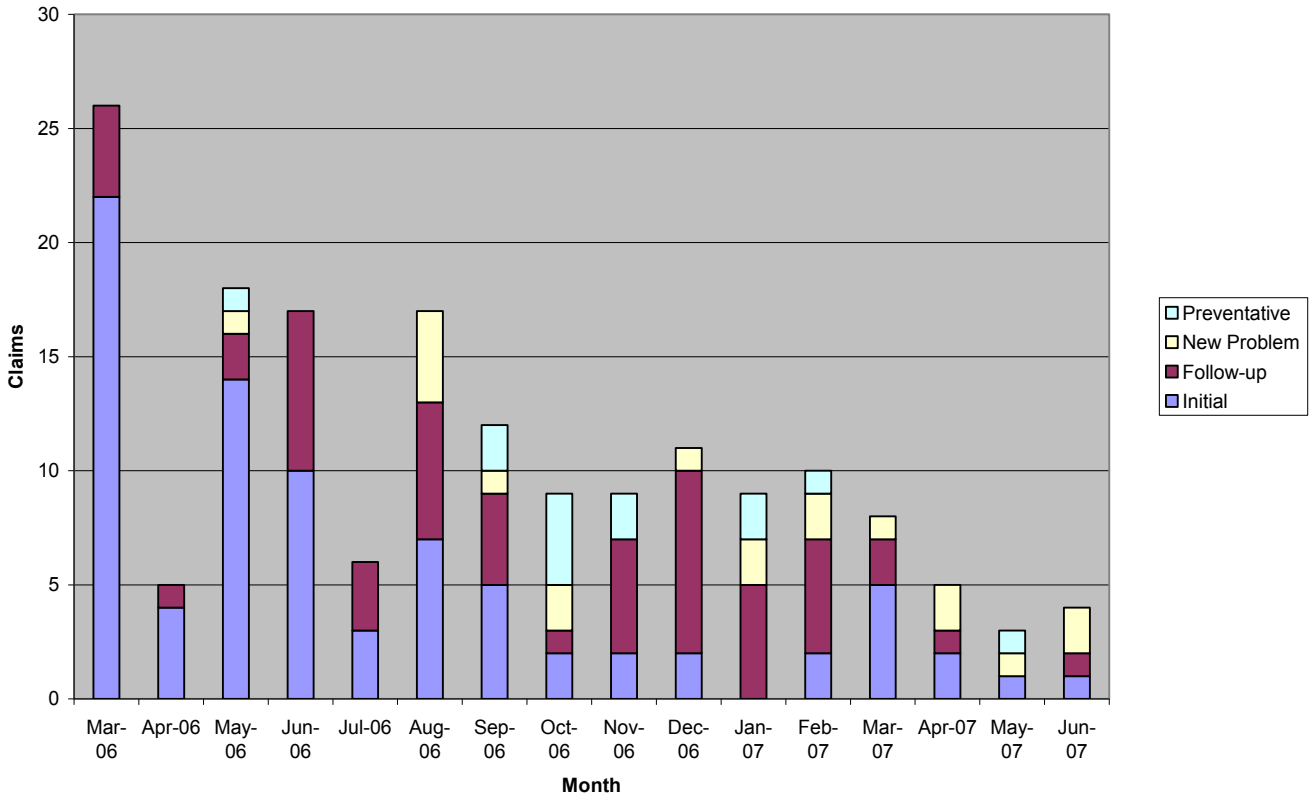


Table 6.4b - Total PCM Claims by Pharmacy

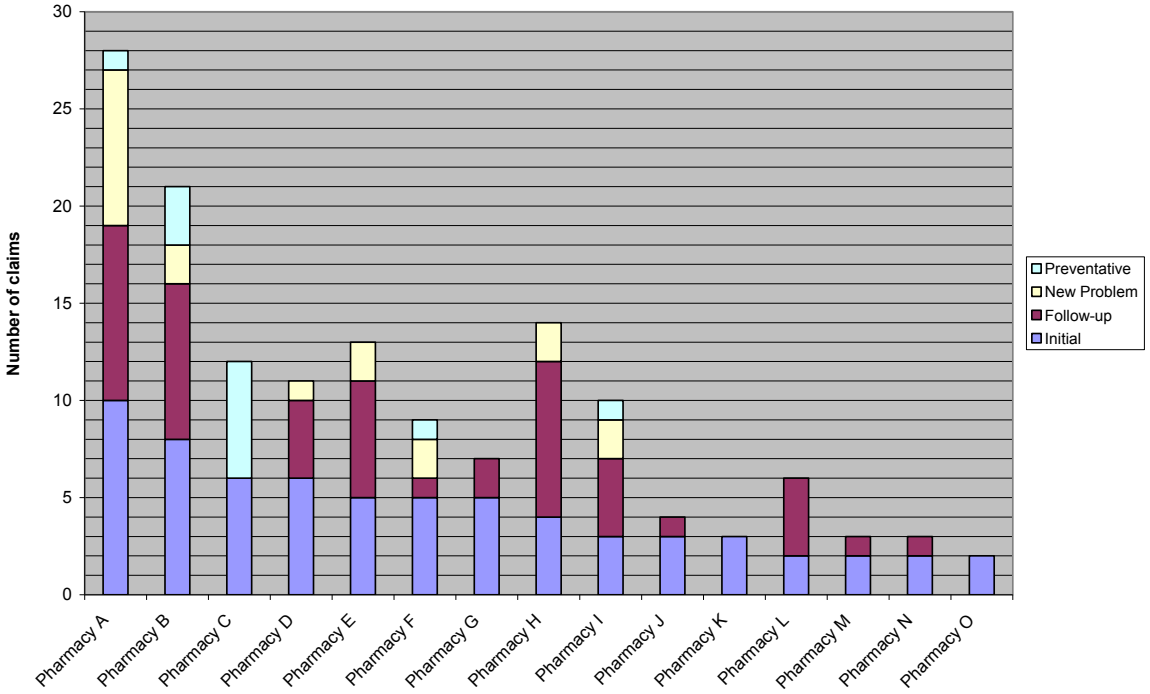


Table 6.4b - Total PCM Claims by Pharmacy, cont.

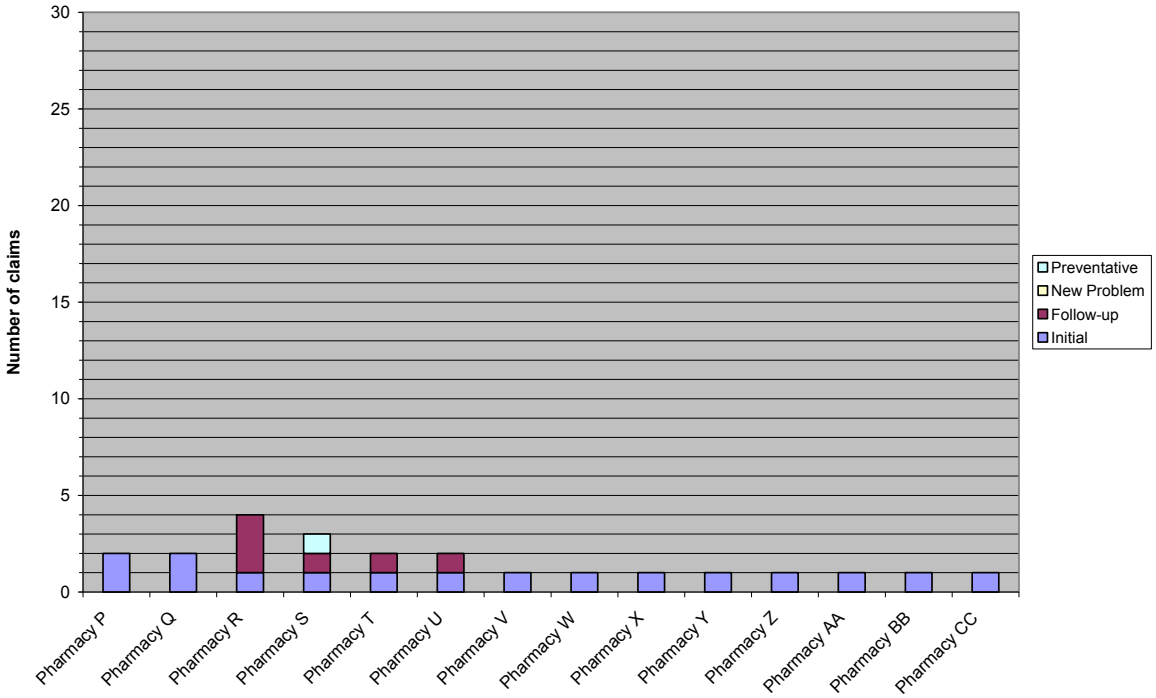


Table 6.4c - Average PCM Claims per Patient by Pharmacy

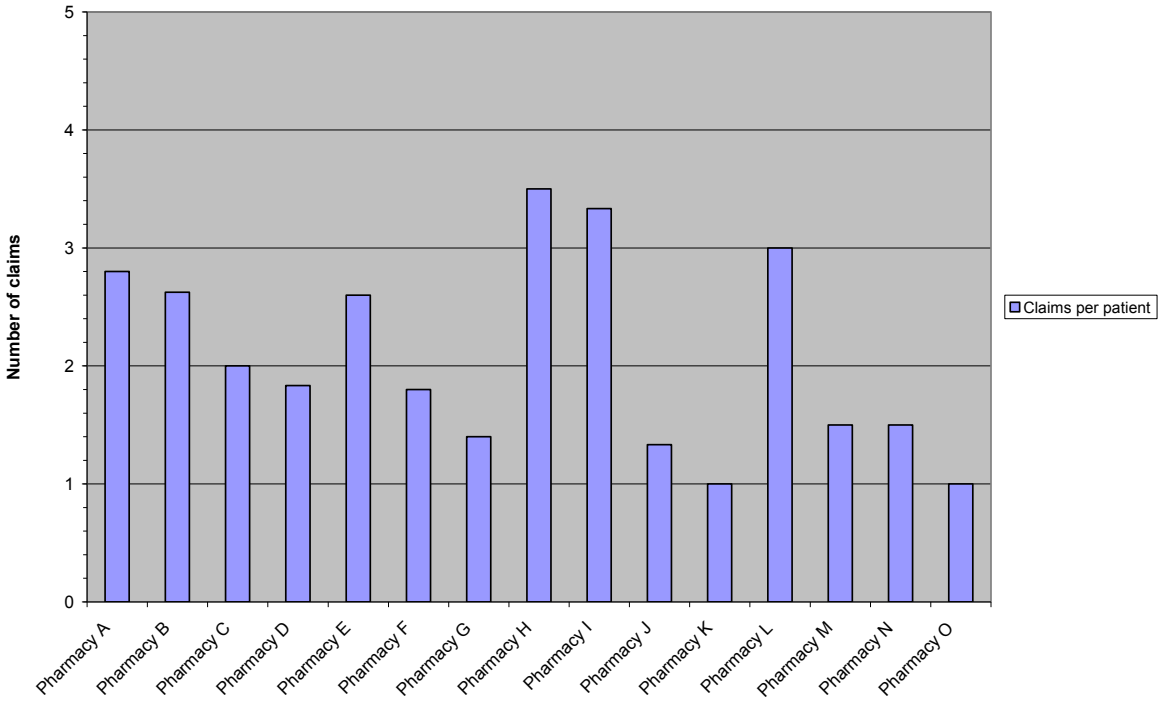


Table 6.4c - Average PCM Claims per Patient by Pharmacy, cont.

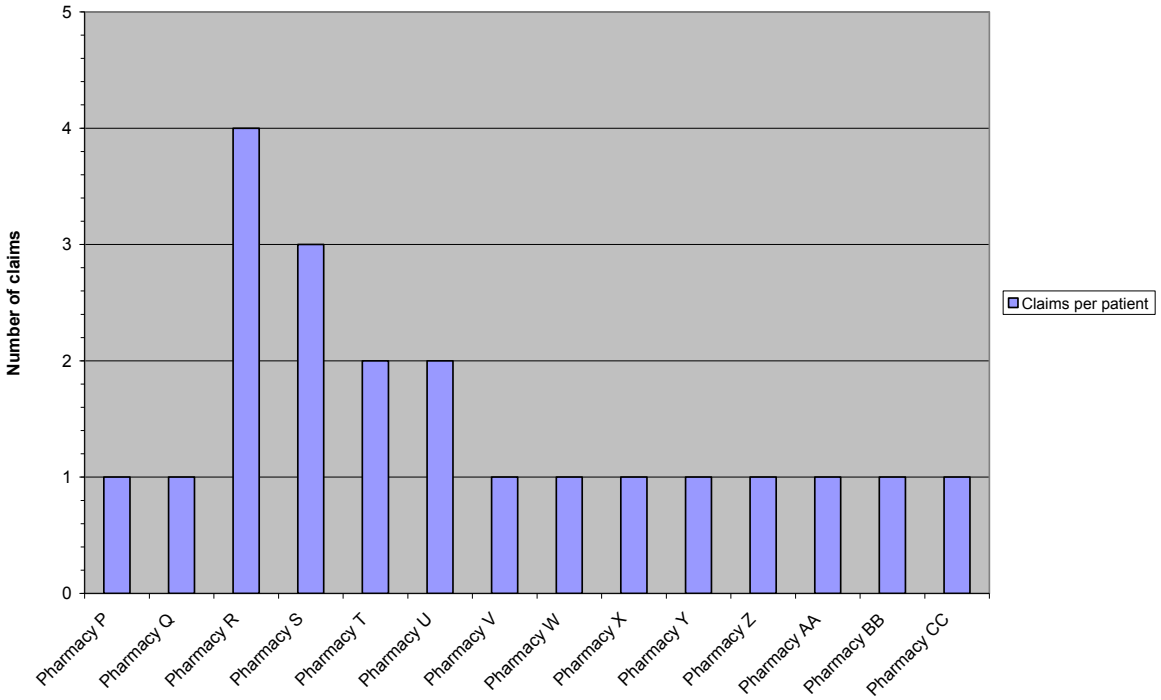
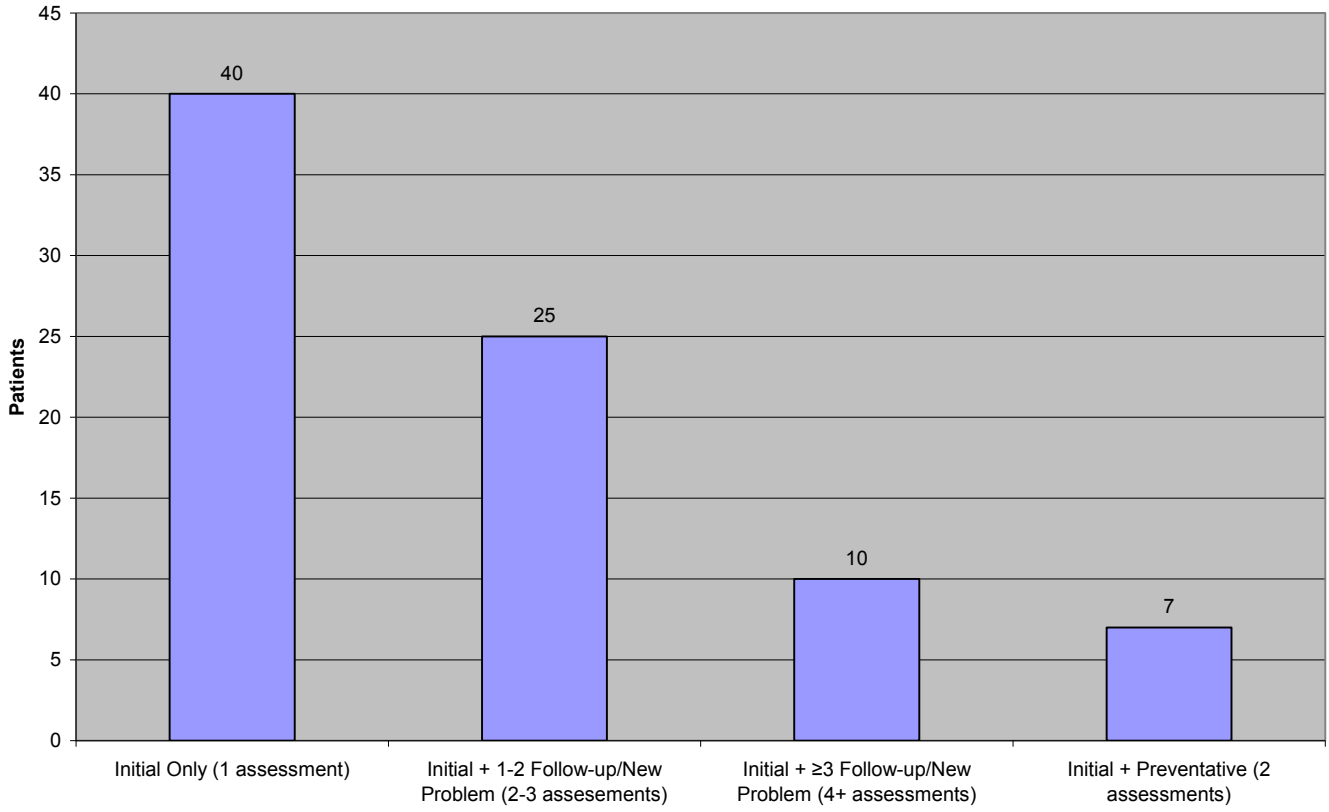


Table 6.4d - PCM Claims per Patient



6.5 Goal E: Establish value to PCM partners

Project objectives included within Goal E were to provide and document value to Farm Bureau and Farm Bureau members as well as create a process for PCM within Wellmark. To date, these goals have not been accomplished. Farm Bureau reported that they received no feedback (either negative or positive) from their members regarding the program.

The final grant report will be presented to project partners at a face to face meeting, date to be determined. Those invited will include IPA staff, Farm Bureau, Wellmark, and Bill Doucette from the University of Iowa. Project findings and perceived value of the program by project partners will be discussed during this meeting.

6.6 Goal F: Report and disseminate program findings

Project findings will be reported to all project partners and the profession of pharmacy. An abstract has been submitted to present a poster of findings at the 2009 APhA Annual Meeting. Additionally, IPA and the University of Iowa have plans to develop a manuscript for publication.

7 Data Collection

Several barriers were traversed before final collection of the data. Working with multiple partners and legal departments made it difficult to extract data in a timely fashion. The first data pull for eligible patients generated a list of 252 patients. Unfortunately, this extraction used NDC codes, rather than AHFS drug codes, as the variable for determining if a patient was taking four or more medications. This resulted in patients being identified that were not truly eligible (false positives). This occurred when patients changed doses of the same drug or switched drugs within the same drug class. This patient list was distributed to pharmacists, and these patients were contacted by both Farm Bureau and their pharmacist so they were included in the study, although some did not truly meet the clinical eligibility criteria for being at higher risk to experience drug therapy problems. Once this error was discovered, a second data pull was conducted that generated a list of 480 total patients. 140 patients appeared on the first and second data pulls. 111 patients were included that were not truly eligible, and it was determined that 80 of these patients had been 'accepted' by pharmacies into their PCM program. Patients that were not truly eligible but still received PCM were not excluded in the program evaluation.

Several surveys were conducted during the pilot project. For the project evaluation, a survey was sent to all participating pharmacies in August, 2007 to assess barriers and facilitators to implementing PCM within community pharmacies. (Appendix R) The response rate to this survey was 54.2%. (32 out of 59)

Pharmacies were also asked to submit project materials for the final evaluation. Pharmacies were offered $25 per patient for submitting de-identified medication dispensing records and patient charts. Project materials were submitted to the principal investigator for 46 out of 89 patients.

Lastly, data were collected from the submitted claims through IPA's website. These data included patient and pharmacy name; assessment type and date; patient responses to two health status questions; and brief information related to DTPs.

A major barrier to completing the final evaluation of this project included the delay in receiving data from Wellmark at the end of the study period. Requests for data and the establishment of a data use agreement began at the onset of the project. However, upon the completion of the 18 month pilot, continued requests occurred for an additional 6 month time period. The single largest delay came from Wellmark's legal department not signing a Data Use Agreement. With no Data Use Agreement, Wellmark could not release data to the principal investigator. Data were finally received in March 2008.

8 Budget and Narrative

Grant Request: $113,460
In-Kind: $ 18,750
Total Budget: $132,210

Professional Payment		**Budget**	**Request**	**Actual**
PCM Payments to Pharmacists		$62,500	$62,500	$10,790
Assumptions:	250 patients $250 average payment per patient			
PCM Payments to Physicians		$ 6,250	$ 0	$0
Assumptions:	10% of pharmacist payments IFBF's responsibility			
Evaluation Costs				
Evaluation Team Personnel				
Assumptions:	Research Director 0.1 FTE	$10,000	$10,000	$59,838
	Research Assistant 0.25 FTE	$ 9,000	$ 9,000	
Survey/Mailings/Communications		$ 500	$ 500	$ 1,500
Assumptions:	100 x $5			
Travel				
Assumptions:	5 meetings with partners	$ 500	$ 500	
	Poster Presentation	$ 2,000	$ 2,000	$ 2,500*
Administrative Costs				
Administrative Personnel				
Assumptions:	Program Director 0.2 FTE	$16,000	$16,000	$16,000
	Administrative Assistant 0.2 FTE	$ 5,000	$ 5,000	$ 6,000
Mailings/Communications				
Assumptions:	Recruitment 500 x $5	$ 2,500	$ 2,500	$ 7,024.55
	IFBF Notices 2 x $3000 (IFBF in-kind)	$ 6,000	$ 0	
	Payment 300 x $5 (Wellmark in-kind)	$ 3,000	$ 0	
	Training 140 x $15	$ 2,100	$ 2,100	$ 2,002.89
	Data Interfaces Upgrades (Partners in-kind)	$ 1,500	$ 0	
Web-based claim/billing development				$ 5,698.65
Travel				
Assumptions:	Training Meetings 10 x $300	$ 3,000	$ 3,000	$ 3,000
	Partner Meetings 18 x $20	$ 360	$ 360	$ 340
	Poster Presentation (IPA in-kind)	$ 2,000	$ 0	$ 0
Total		$132,210	$113,460	$114,694.09
Final		$152,000		

* at time of grant report submission, some expenses not yet posted

A few discrepancies exist between the requested budget amount and the actual project budget. The most important discrepancy relates to funds requested for payments to pharmacists for PCM services. The requested $62,500 assumed that, on average, pharmacists would provide an initial assessment and approximately four follow up assessments for 250 patients. ($250.00 per patient) In the pilot project, pharmacists

provided an average of 1.92 assessments to 83 patients. ($130.00 per patient) Additionally, payment made to the principal investigator increased significantly from the initial request for two reasons: to support a robust evaluation of the pilot project data and to support the assistance provided by the principal investigator with the project report. An unanticipated cost was for the development and support of an online claim submission and data collection website.

The poster presentation and travel to present the project poster at a national pharmacy meeting has not yet occurred. These monies will be spent in the spring of 2009 to present the poster at APhA's Annual Meeting. At the time of the grant report an abstract has been submitted to APhA.

9 Program Evaluation
(as submitted by William Doucette, PhD, Principal Investigator)

9.1 Executive Summary

This report evaluates the pharmaceutical case management (PCM) service offered to members of the Iowa Farm Bureau Federation. The objectives of this evaluation were (1) to describe the effect of PCM on the appropriateness of medication for people in a private insurance group, (2) to characterize the drug-related problems (DRPs) identified by pharmacists performing PCM services, (3) to compare health care utilization among people eligible for the PCM service (those who received PCM vs. those who did not), (4) assess the effect of PCM on self-reported health status, and (5) to assess pharmacist barriers to delivering PCM services. Health utilization included number of physician visits, number of hospital services, number of different prescription drugs, cost of physician visits, cost of hospital services, and cost of prescription drugs.

For Objective 1, PCM visit notes and dispensing records were used to identify drug-related problems and calculate Medication Appropriate Index (MAI) scores for 46 patients who received the PCM service. Paired t-tests were performed to compare MAI scores at the baseline (before PCM) and after the final PCM visit. In addressing Objective 2, PCM claims data provided information on the frequency and type of drug-related problems reported by pharmacists during PCM visits.

For Objective 3, medical and pharmacy claims data were used to compare two groups of patients: Group 1 (n=73), the intervention group (people who received PCM), and Group 2 (n=171), the comparison group (people who were eligible for PCM from February 1, 2006 to January 31, 2007 but did not receive PCM). Utilization for the 13-month period prior to initiation of the PCM service (Study Period 0, January 1, 2005 to January 31, 2006) and utilization for the 18-month study period after PCM initiation (Study Period 1, Feb 1, 2006 to July 31, 2007) were calculated. Utilization of each resource for Study Period 0 was compared using t-tests for Group 1 vs. Group 2. In addition, changes in utilization from Study Period 0 to Study Period 1 for Group 1 vs. Group 2 were compared using t-tests. For Objective 4, health status was collected by the pharmacists during PCM visits, using a single question in which the patients rated their health status as poor, fair, good, very good or excellent. To address Objective 5, a pharmacist fax survey was sent to 59 pharmacists who had been assigned patients eligible for PCM services. The survey used a 7-point Likert scale to have the pharmacists rate 16 potential barriers to providing PCM services.

The average MAI scores were relatively low, showing little medication inappropriateness for subjects who received PCM. No significant difference of MAI scores was found between the baseline and the final PCM visit. A total of 244 drug-related problems were identified from PCM claims, with “need for additional therapy” being the most common problem (30.3% of DRPs) and adverse drug reaction being next most prevalent (19.3% of DRPs).

For health utilization, the PCM group (Group 1) showed a significant increase in the number of prescription medications from Study Period 0 to Study Period 1, compared with the comparison group (Group 2). However, this increase in the number of medications was not seen for costs of medications. In summary, PCM had a weak effect on health utilization, which may be related to the relatively low level of medication inappropriateness seen with this population of patients.

Analysis of patient-reported health status showed similar numbers of people who reported decreased health status (N = 15) as the number who stated that their health status has improved (N = 16) during the time between their first PCM visit and their last.

Fax surveys were received back from 32 (54.2%) participating pharmacists. The respondents identified six factors as potential barriers to providing PCM services: pharmacist time availability, pharmacy staffing levels, pharmacy dispensing volume, patient willingness to receive PCM services, the ease of use of the pharmacy's system to document PCM services, and too few PCM patients to justify the cost of providing PCM services.

9.2 Objectives

The Iowa Pharmacy Association coordinated a program in which Iowa pharmacists provided pharmaceutical case management (PCM) services to members of the Iowa Farm Bureau Federation (IFBF). IFBF is a 100,000 member, private sector healthcare purchaser who coordinates benefits through Wellmark Blue Cross and Blue Shield of Iowa. The PCM service was initiated on February 1, 2006 and ended on July 31, 2007. This report describes an evaluation of the PCM services.

The objectives of this evaluation were (1) to describe the effect of PCM on the appropriateness of medication for people in a private insurance group, (2) to characterize the drug-related problems (DRPs) identified by pharmacists performing PCM services, (3) to compare health care utilization among people eligible for the PCM service (those who received PCM vs. those who did not), and (4) to assess pharmacist barriers to delivering PCM services.

9.3 Methods

IFBF beneficiaries were clinically eligible for PCM if they used at least four chronic medications, and had at least one of 12 disease states (congestive heart failure, atrial fibrillation, hypertension, ischemic heart disease, dyslipidemia, osteoarthritis, gastroesophageal reflux disease, peptic ulcer disease, depression, diabetes, asthma, or chronic obstructive pulmonary disease). Pharmacists who had provided PCM services for Iowa Medicaid program were eligible for participation in the program. Other pharmacists at new pharmacy locations also were eligible for participation if they met Medicaid PCM eligibility criteria. A final eligibility criterion was that at least 50% of a patient's prescriptions were dispensed at a PCM pharmacy. If at least 50% of a patient's

prescriptions were dispensed at a non-PCM pharmacy, the patient was assigned to the comparison group.

For the first objective, pharmacies providing the PCM service were contacted via email and asked to fax their PCM notes and dispensing records from November 1, 2005 through July 31, 2007. During PCM visits, drug-related problems were identified by participating pharmacists. Based on the PCM notes and dispensing records, a residency-trained pharmacist rated Medication Appropriate Index (MAI) for patients who received the PCM service. MAI scores were rated by assigning "appropriate", "marginally appropriate", or "inappropriate" to ten attributes of each medication.[2] The ten attributes include: indication, effectiveness, correct dosage, correct directions, practical directions, drug–drug interaction, drug-disease interaction, duplication, duration of treatment, and cost. Three methods of rating were applied – Hanlon MAI Score, Adapted MAI Score, and Balanced MAI Score.[2] The mean MAI scores for each patient were calculated. Paired T-tests were performed to compare three MAI scores at baseline (before PCM) and after the final PCM visit.

To describe the PCM services, PCM claim files were used to calculate the number of drug-related problems identified by pharmacists during PCM visits. The type of drug-related problems included: inappropriate adherence, need for additional therapy, unnecessary drug therapy, adverse drug reaction, dose too high, wrong dose, and dose too low.

For the second objective, medical and pharmacy claims from January 1, 2005 to July 31, 2007 were obtained from Wellmark Blue Cross and Blue Shield for IFBF members. These patients were divided into two groups: Group 1, the intervention group (people who received PCM), and Group 2, the comparison group (people who were clinically eligible for PCM from February 1, 2006 to January 31, 2007 but did not receive PCM).

Health utilization was measured in two ways: number of visits/services/drugs, and cost of visits/services/drugs. Specific health utilization included number of physician visits, number of hospital services, number of different prescription drugs, cost of physician visits, cost of hospital services, and cost of prescription drugs. These utilization data were aggregated for each patient from Wellmark claims. In addition, the data were cleaned by removing inconsistent records and outliers.

Utilization for the 13-month period prior to initiation of the PCM service (Study Period 0, January 1, 2005 to January 31, 2006) and utilization for the 18-month study period after PCM initiation (Study Period 1, February 1, 2006 to July 31, 2007) were calculated. Utilization of each resource for Study Period 0 was compared using t-tests for Group 1 vs. Group 2. In addition, changes in utilization from Study Period 0 to Study Period 1 for Group 1 vs. Group 2 were compared using t-tests.

During PCM visits the pharmacist asked patients to rate their health status over the past month. The question was, "Overall, how would you rate your health in the past

month?" The response categories were: poor, fair, good, very good, excellent. Pharmacists reported the response when filing the claim for the PCM visit. These data were provided in a de-identified file by IPA's PCM claim web site vendor.

A fax survey was sent out to 59 pharmacists approved as providers of pharmaceutical case management (PCM), a comprehensive medication management service, for a private insurance group. All of the pharmacists surveyed had been assigned patients, identified as eligible to receive PCM services. The survey measured: potential barriers to providing PCM, the number of PCM patients assigned and provided with PCM services, and the pharmacy setting. Potential barriers were rated on 16 items using a 7-point Likert scale (1=Very Strongly Disagree, 2= Strongly Disagree, 3=Disagree, 4=Neutral, 5=Agree, 6=Strongly Agree, 7=Very Strongly Agree). Descriptive statistics were calculated, including the percent of pharmacists agreeing with the presence of a potential barrier. A cut-off of 20% of respondents stating any level of agreement (I.e. agree, strongly agree, or very strongly agree) was used to identify potential barriers to providing PCM services.

9.4 Results

For Objective (1), the PCM notes and dispensing records of 46 patients who received the PCM service were collected. On average, these patients were 59 years old, used 4 to 5 medications, and had two PCM visits (Table 1). Twenty-seven patients were female (59%). A total of 160 visits were provided, or an average of 1.93 visits per patient receiving PCM services. For the 83 patients receiving PCM visits, 244 drug-related problems were identified, with "need for additional therapy" being the most common problem (30.3% of DRPs) (Table 2). The next two most prevalent types of problems were adverse drug reaction (19.3% of DRPs) and inappropriate adherence (17.6% of DRPs). This is an average of 2.94 drug-related problems per patient receiving PCM visits. The average Hanlon MAI Score was 0.30 at the baseline, and 0.26 after the final PCM visit (Table 3). No significant difference was found between the MAI scores at the baseline and after the final PCM visit.

According to Wellmark claims, there were 73 patients in Group 1 (PCM group) and 171 patients in Group 2 (comparison group). Cases were dropped from analyses if the age in the claims was below 18 or above 108, or if their utilization was viewed as an outlier on a scatter plot of each utilization variable. On average, patients were 59.5 years old in Group 1, and 57.1 years old in Group 2 (Table 4). Fifty-one patients in Group 1 were female (69.9%), and 106 patients in Group 2 were female (62.0%). For cost of physician visits during Study Period 0, Group 2 had significantly higher cost than Group 1 ($P<0.05$).

Changes in health care utilization were calculated using data of Study Period 1 minus data of Study Period 0 (Table 5). For number of different prescription drugs, T-tests were significant for Group 1 vs. Group 2, with Group 1 showing a larger increase in the use of prescription drugs during Study Period 1. However, this increase in the number of medications was not seen for costs of medications.

Baseline and a second health status rating were available for 51 people who had at least two PCM visits. Analysis of patient-reported health status showed similar numbers of people who reported decreased health status (N = 15) as the number who stated that their health status has improved (N = 16) during the time between their first PCM visit and their last.

Fax surveys were received back from 32 participating pharmacists. Using the 20% cut-off, the respondents identified six factors as potential barriers to providing PCM services: pharmacist time availability, pharmacy staffing levels, pharmacy dispensing volume, patient willingness to receive PCM services, the ease of use of the pharmacy's system to document PCM services, and too few PCM patients to justify the cost of providing PCM services (Table 6). Only one barrier was agreed upon by over half of the responding pharmacists: patient willingness to receive PCM services.

9.5 Discussion

For these private insurance beneficiaries, no significant difference was found between the medication appropriateness index scores at the baseline and after the final PCM visit. Compared with PCM service for Iowa Medicaid program [1], the MAI score was much lower in this program. In Iowa Medicaid program, the average MAI score for patients receiving PCM was 9.4 at baseline, and 8.3 at follow-up [1], whereas in this program, the average MAI score was 0.30 at the baseline, and 0.26 after the final PCM visit. Meanwhile, the number of medications was lower in this program as well. In Iowa Medicaid program, the average number of medications for patients receiving PCM was 7.5 at baseline, and 7.8 at follow-up [1], whereas in this program, the average number of medications was 4.7 at the baseline, and 4.6 after the final PCM visit. Though the same PCM eligibility criteria were used for both Iowa Medicaid program and this program, the need for PCM appears different. The IFBF members, on average, used fewer medications, and had considerably lower MAI score.

In addition, IFBF members may have greater resources than Iowa Medicaid beneficiaries to support their health. Thus, it seems that the eligibility criteria for PCM should vary across patient groups. More studies are needed for this issue. A single pharmacist rated the inappropriateness of medication use. Though this person was an experienced, residency-trained pharmacist, it is possible that her ratings of inappropriateness might have been consistently low. However, initial training cases of PCM suggest this was not the issue.

The PCM group (Group 1) showed a significant increase in the number of prescription medications from Study Period 0 to Study Period 1, compared with the comparison group (Group 2). However, the PCM group did not have a significant increase in the cost of prescription drugs, which indicates that less expensive medications were added for PCM group. This could arise from greater use of generics, or perhaps suggested use of generics by pharmacists at PCM visits. Overall, the finding is consistent with the low MAI scores, since it seems that on average, PCM had a weak effect on

health utilization. However, PCM did not significantly increase the cost of medications, or other health care services.

On average, almost three drug-related problems per patient were identified by pharmacists over the 18-month PCM service period. This is somewhat lower than the three drug-related problems per 12 months reported for PCM services delivered to Iowa Medicaid beneficiaries[3], though it is within the range of problems reported in the literature.[4-7] The type of drug-related problem differed between this private insurance group and Medicaid beneficiaries. In the private group, the need for additional therapy was higher (30.3% vs. 22.0%), but inappropriate adherence was lower (17.6% vs. 25.9%). Another difference was a higher rate of adverse drug reactions for the private group (19.3% vs. 11.1%). These findings, along with the MAI and utilization results, illustrate differences between the private group and Medicaid group, despite the use of the same PCM eligibility criteria.

Workload issues were the most common barriers inhibiting pharmacists' ability to provide PCM. Pharmacists indicated that workflow and human resource constraints were the most common barriers to inhibiting the provision of PCM. With the current high volumes of dispensing required, pharmacists believed that they either did not have enough time or that the staffing levels were not adequate to allow them time to perform PCM services.

Patient related issues were identified as barriers to providing PCM services. The value of PCM services was not recognized by some patients, making them reluctant to receive such services. Given the emerging nature of PCM services, it is reasonable that many patients have not experienced them, which can contribute to low perceived value. Also, given the relatively low drug morbidity found in this population, limited patient demand is understandable.

In conclusion, MAI scores in this program were low, suggesting limited need for PCM services using these eligibility criteria. Overall, PCM services had a weak effect on health utilization, which appears to be related to the relatively low level of medication inappropriateness seen with this population of patients. Future study of additional eligibility criteria could better match PCM services with patient need.

Table 9.1
Characteristics of Patients Included in Medication Appropriateness Index (MAI) Analysis

Variable	N	Mean (SD)	Median	Range
Age (years)	46	58.7 (8.4)	61	31-67
No. of medications at baseline (before PCM)	46	4.7 (2.2)	4	1-12
No. of medications after the final PCM visit	45	4.6 (2.0)	4	1-11
No. of PCM visits	45	2.0 (1.3)	2	1-8

Table 9.2 Frequency of Drug-Related Problems

Drug-Related Problem Category	Frequency (%)
Adherence	
Inappropriate adherence	43 (17.6)
Indication	
Need for additional therapy	74 (30.3)
Unnecessary drug therapy	34 (13.9)
Safety	
Adverse drug reaction	47 (19.3)
Dose too high	9 (3.7)
Effectiveness	
Wrong drug	21 (8.6)
Dose too low	16 (6.6)
Total	244 (100)

Note: Among 244 drug-related problems, 218 (89.3%) were resolved.

Table 9.3
Comparison of Three MAI Scores at the Baseline and End

Calculation Method	Mean±Std at Baseline	Mean±Std at End	Difference	P-value
Hanlon [a]	0.30±0.27	0.26±0.25	0.04	0.20
Adapted [b]	0.56±0.45	0.50±0.46	0.05	0.31
Balanced [c]	0.43±0.31	0.38±0.31	0.04	0.14

Note: [a] 0 was assigned for appropriate or marginally appropriate use and 1 was assigned for inappropriate use.

[b] 0 was assigned for appropriate use and 1 was assigned for marginally appropriate or inappropriate use.

[c] 0 was assigned for appropriate use, 0.5 was assigned for marginally appropriate use, and 1 was assigned for inappropriate use.

Table 9.4
Comparison of Demographics and Health Care Utilization during Study Period 0 (Pre-PCM)

Variable	Group 1 (N=73) Mean ± Stnd Dev	Group 2 (N=171) Mean ± Stnd Dev
Age (years) [a]	59.5±7.0	57.1±8.7
Gender (% female)	69.9%	62.0%
No. of physician visits	27.5±16.9	30.7±20.2
No. of hospital services	11.6±11.7	11.7±19.2
No. of different Rx drugs	11.8±5.3	12.9±6.2
Cost of physician visits ($) [b]	1,895.8±1,553.0	2,566.0±2,892.0
Cost of hospital services ($)	2207.7±3,655.1	3,281.0±6.059.0
Cost of Rx drugs($)	2,613.8±1,875.0	2,745.3±1,984.1

Note: [a] Age was calculated for each patient using the claim date minus the date of birth.
[b] T-tests were significant: Group 2 cost > Group 1 cost.

Table 9.5
Comparison of Changes in Health Care Utilization from Study Period 0 to Study Period 1 [a]

Variable	Change in Group 1 (N=73) Mean ± Stnd Dev	Change in Group 2 (N=171) Mean ± Stnd Dev
No. of physician visits	11.6±26.6	3.9±34.5
No. of hospital services	5.2±25.6	4.6±24.8
No. of different Rx drugs [b]	3.1±5.2	0.3±7.5
Cost of physician visits ($)	983.9±2,578.0	488.1±4,251.5
Cost of hospital services ($)	1,307.3±5,989.3	1,245.1±10,170.6
Cost of Rx drugs ($)	981.6±1,377.8	594.6±2,047.8

Note: [a] Changes were calculated using data of Study Period 1 minus data of Study Period 0.

[b] T-tests were significant for Group 1 vs. Group 2, and Group 1 used more prescription drugs during Study Period 1.

Table 9.6
Potential Barriers to Providing PCM Services

Potential Barrier	Mean (SD)†	Percent Agree‡
Patients that I asked about PCM services declined to participate	4.38 (1.50)	53.1
I had adequate time to provide PCM services	3.88 (1.60)	40.6
Dispensing activities were too heavy to support me providing PCM services	3.78 (1.52)	40.6
Staffing levels did not allow me to provide PCM services	3.66 (1.45)	29.1
My pharmacy lacks a system to document PCM services that is easy to use	3.28 (1.42)	25.0
There are too few PCM patients to justify the cost of providing PCM services	3.48 (1.34)	22.6
I am concerned about local physician resistance to me providing PCM services	3.03 (1.36)	15.6
My pharmacy does not have a useful follow-up system for PCM services	2.97 (1.43)	15.6
Patients that were eligible for PCM services really didn't need them	3.50 (0.95)	12.5
Billing for PCM services was difficult to figure out	3.19 (1.38)	12.5
My pharmacy has inadequate space for providing PCM services	2.72 (1.67)	12.5
I was unable to collect the patient information I needed to provide PCM services	2.81 (1.38)	6.2
It was difficult to identify a patient as being eligible for PCM services	2.69 (1.15)	6.2
The management at my pharmacy does not support provision of PCM services	2.03 (1.43)	6.2
I do have sufficient experience to provide PCM services	5.91 (1.03)	3.1
I do not really know how to provide PCM services	2.06 (1.16)	3.1

†Scale: 1=Very Strongly Disagree 2=Strongly Disagree 3=Disagree 4=Neutral 5=Agree 6=Strongly Agree 7=Very Strongly Agree
‡Includes Agree, Strongly Agree and Very Strongly Agree

Table 9.7
Patient-Reported Health Status for PCM Recipients

Health Status	Baseline PCM Visit Frequency (%) (N = 90)	Final PCM Visit Frequency (%) (N = 51)
Excellent	6 (6.7)	4 (7.8)
Very Good	31 (34.5)	13 (25.5)
Good	38 (42.2)	32 (62.7)
Fair	12 (13.3)	1 (2.0)
Poor	3 (3.3)	1 (2.0)

Question: Overall, how would you rate your health in the past month?
Total frequency for final PCM visit equals 51 due to missing data (only one PCM visit or health status not reported in PCM claim).

Change in Patient-Reported Health Status (Baseline vs. Final PCM Visit)

Change Category	Frequency (%)
Decreased health status	15 (29.4)
No change in health status	26 (39.2)
Improved health status	16 (31.4)

N = 51

Analysis of patient-reported health status shows an equal number of people who decreased health status vs. improved health status between their first and last PCM visits. The largest proportion (39.2%) of PCM beneficiaries reported no change in health status. The impact of PCM services on health status is difficult to determine, in part due to a considerable level of missing data. The missing data resulted from 39 people having only a single PCM visit.

10 Discussion

Implementation of PCM in a private sector health plan demonstrated several significant findings. Pharmacists experienced several barriers to implementing PCM services for private-sector patients in their community pharmacy settings. Private sector patients meeting the same eligibility criteria as Medicaid patients had higher levels of health. Patients' baseline medication appropriateness index (MAI) scores were 0.3 whereas baseline MAI scores in Medicaid beneficiaries were 9.6. Additionally, subjective feedback from pharmacists participating in the pilot project revealed a lower perceived need by the pharmacists for eligible patients to receive PCM services.

PCM, and other MTM services, are provided by pharmacists, often in the community pharmacy setting, to patients at risk for developing drug therapy problems. Although face-to-face service is a standard of care with the Iowa Medicaid PCM program and a few other Medicare Part D programs, pharmacists experience numerous barriers when attempting to implement and robustly provide these services. For this project, the main barriers include patient declination (53.1% of participating pharmacists); inadequate time to provide the service (40.6%); heavy dispensing volume (40.6%); staffing issues (29.1%); lack of documentation system (25%); too few PCM patients to justify implementing service (22.6%); concern of physician resistance (15.6%); eligible patients had low need for service (12.5%); and inadequate space in pharmacy to provide PCM service (12.5%). Other service delivery methods including consultant pharmacists in the community pharmacy setting, consultant pharmacists in a setting other than the community pharmacy (ie clinic or medical office, or non-traditional setting), telephonic, or other tele-communication models should be evaluated against face-to-face PCM delivery in the community pharmacy setting to build on research done elsewhere.

Further research is also warranted to prove the need for eligibility criteria within MTM programs such as PCM. As MTM evolves, discussion about MTM standards, such as consistent billing mechanisms, consistent payment, and consistent eligibility criteria is needed. This pilot demonstrates that consistent eligibility criteria does not necessarily yield the same degree of risk among patients for developing drug therapy problems. Eligible Farm Bureau patients were on average, 58.7 years old taking 4.7 chronic medications; whereas Medicaid beneficiaries meeting the same eligibility criteria were on average, 52.5 years old taking 7.5 chronic medications. One method to consider would be elimination of eligibility criteria among MTM programs in the future. Due to low uptake of face-to-face pharmacist provided MTM in community pharmacy settings, patients may be better served by receiving PCM on a referral basis. In this proposed model, physicians could refer patients to a pharmacist for PCM services, pharmacists could identify patients with a need for the service, or patients could self refer into a program. The benefit of PCM in improving health care outcomes with a neutral budget is demonstrated in this pilot and other programs.[1,3] Therefore, healthcare provider and self-referral programs could be implemented to provide PCM to patients for whom risk is detected and a need is perceived. Study is warranted to learn what the uptake would be of a program with this criteria design. Additionally, as stated in the Joint Commission of Pharmacy Practitioners (JCPP) 2015 Vision, patients cannot be expected to demand a service they have never received. As PCM and other MTM programs evolve, patients must demand and seek these services, rather than pharmacists initiating contacting with a patient asking them to come into the pharmacy to receive a service they are providing at no cost to the patient. Additionally, cost-sharing models should be considered within MTM programs, so the value of the service is greater perceived by patients.

Although PCM had a weak effect on health utilization, there are factors that should be taken into consideration when reading this statement. The evaluation included only 83 patients that received the PCM service, and a percentage of those did not meet the eligibility criteria, but were included in the pilot program. Patients in the pilot program also had a low level of medication inappropriateness and a lower need for the service. It is more difficult to see a significant effect of a service such as PCM in patients with limited need. Lastly, each patient in the intervention group receiving PCM received, on average, 1.93 PCM assessments. It has been shown that a higher impact on health utilization corresponds with higher intensity of PCM services.[1] Lastly, patients receiving PCM services in this pilot showed a significant increase in the number of prescription medications; however a corresponding increase in cost of medications was not shown.

PCM services provided an important, unique service to eligible private sector patients. On average, almost three DRPs per patient were identified by pharmacists over the 18 month pilot period. It is positive to note that even with the low intensity of PCM services, 89% (218 of 244) drug therapy problems were resolved. This high percentage shows that pharmacists providing PCM services are adept.

To stimulate patient demand for PCM services, pharmacists must increase capacity for providing these services. Further discussion of the most cost-effective and patient accessible service delivery model is warranted. Until patients perceive a need, and ultimately realize a value from PCM services, they will not demand it. Without patient demand, PCM and other MTM services will struggle to become a standard of practice in community pharmacy settings. Today there are handfuls of pharmacies that serve as our profession's 'Centers of Excellence,' but we have not yet achieved a state where these services are the standard of care at all community pharmacies.

11 Conclusions and Recommendations

PCM, and other MTM programs will continue to develop and present opportunities for pharmacists to be compensated for managing patients' medication therapy regimens. As pharmacists transition from the dispensing role in community pharmacies to the role of health care providers, programs such as medication therapy management programs will need to become a standard of care that patients expect to receive from pharmacists. This project demonstrated that implementing PCM in a private sector health plan provided value to the eligible patients who received the service, while also demonstrating a low uptake of the service by eligible patients. This project also demonstrated the need for further assessment of community pharmacy practice and incorporation of PCM services at these sites. Future study on eligibility criteria for medication therapy management services, such as PCM will be important as the profession of pharmacy moves toward MTM standards.

As PCM has shown to be a valuable service to patients who elect to receive the service, project coordinators recommend that PCM be implemented as a long-term benefit in private health care plans. A meeting between Wellmark, Farm Bureau, IPA, and the Principal Investigator to discuss project outcomes and perceived value by Wellmark and Farm Bureau will be scheduled to discuss this recommendation.

With the implementation of PCM as a long-term benefit, additional recommendations will be made to Wellmark and Farm Bureau. As previously discussed, community pharmacists currently face numerous barriers to providing PCM and other MTM services routinely amidst the dispensing workflow that currently exists in most community pharmacies. Additional points of access should be considered for where PCM providers can provide the service to patients.

Additionally, as demonstrated through the large variation in health status and medication appropriateness index between patients in the Iowa Medicaid program and patients in the private sector pilot project using the same eligibility criteria, consideration of the need for pre-determined eligibility should be considered in a long-term PCM program.

As medication therapy management (MTM) services continue to grow, PCM will meet a growing demand in the health care marketplace. PCM is a robust program providing comprehensive medication services throughout the year. Additionally, PCM serves to reduce overall health care costs and health care utilization. IPA should continue to educate pharmacists on the opportunity to provide PCM and other MTM programs to eligible patients in Iowa. IPA, large employers, and the profession of pharmacy should consider the barriers to implementing PCM in community pharmacy settings and evaluate the survey findings further. Although the study evaluation for this program suggested a limited need for PCM due to a relatively low level of medication inappropriateness, value was demonstrated by pharmacists identifying, on average, just under three DRPs per patient.

12 References

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13 Appendices

A. Wellmark/Farm Bureau PCM training webcast

B. Business Associate Agreement

C. Farm Bureau notification to patients

D. Pharmacist Feedback at 2 months via telephone interview

E. Fax to physician cover letter

F. Case Management / Disease Management Referral form

G. Optional Claims and Data Form

H. Optional Medication History Form

I. Sample Letter (To: patient/ From: pharmacist)

J. Sample Telephone Script

K. Optional PCM Fax Communication Form Between Providers

L. Monthly project team member meeting minutes

M. Business Plan: Implementation of the PCM Model in a Private Sector Heath Plan

N. Fax notification to PCM providers

O. 6 month follow up survey responses

P. *Spokesman* Publication

Q. *Blue* Publication

R. Pharmacist Follow up Survey