
Improving Population Management through Pharmacist-Primary Care Integration: A Pilot Study

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Follow the Money: Impact of Payment Reform and Health Policy on Pharmacy Practice

Background

- 75% of all primary care visits include prescribing or continuing medications
- Given the association between polypharmacy and drug-related problems, there is a critical need to improve primary care prescribing.

Abstract

Pharmacists have unique skills that may benefit primary care practices. The objective of this demonstration project was to determine the impact of integrating pharmacists into patient-centered medical homes, with a focus on population management. Pharmacists were partnered into 5 primary care practices in Vermont 1 day per week to provide direct patient care, population-based medication management, and prescriber education. The main measures included a description of drug therapy problems identified and cost avoidance models. The pharmacists identified 708 drug therapy problems through direct patient care (336/708; 47.5%), population-based strategies (276/708; 38.9%), and education (96/708; 13.6%). Common population-based strategies included adjusting doses and discontinuing unnecessary medications. Pharmacists' recommendations to correct drug therapy problems were accepted by prescribers 86% of the time, when data about acceptance were known. Of the 49 recommendations not accepted, 47/49 (96%) were population-based and 2/49 (4%) were related to direct patient care. The cost avoidance model suggests \$2.11 in cost was avoided for every \$1.00 spent on a pharmacist (\$373,092/\$176,690). There was clear value in integrating pharmacists into primary care teams. Their inclusion prevented adverse drug events, avoided costs, and improved patient outcomes. Primary care providers should consider pharmacists well suited to offer direct patient care, population-based management, and prescriber education to their practices. To be successful, pharmacists must have full permission to document findings in the primary care practices' electronic health records. Given that many pharmacist services do not involve billable activities, sustainability requires identifying alternative funding mechanisms that do not rely on a traditional fee-for-service approach. (*Population Health Management* 20xx;xx:xxx-xxx)

Citation:

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Background

Rationale

- Evidence suggests that pharmacists in **ambulatory settings** reduce hospital and emergency department admissions, nonscheduled health services, number and cost of drugs, and improves prescribing.
- Pharmacists have been shown to optimize patient outcomes and improve patient safety.
- With innovative care and payment models (PCMHs and ACOs), there are new opportunities to integrate the unique skills of pharmacists into **primary care teams**.

Objective

- To determine the impact of integrating pharmacists into patient-centered medical homes, with a focus on population management.
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Methods: Study Design

- Observational design with no control group
- Data from January 2012 through August 2013
- Approved by the Committees on Human Research at the University of Vermont

Methods: Population

- The participants (pharmacists and primary care practices) were recruited by **convenience sample** to represent the typical primary care environment of Vermont.
 - Eligible pharmacists' inclusion criteria:
 1. Vermont pharmacy license
 2. Work near their physician partner practice
 3. Have approval from their supervisor for the release time needed for participation.
 - Pharmacists were not required to have experience or specialty training in ambulatory care.
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Methods: Setting

- Primary care practices were selected to ensure diversity across demographic variables within Vermont
 1. Geography (rural, urban, multiple counties)
 2. Practice type (internal medicine, family medicine)
 3. Practice ownership (hospital owned, Federally Qualified Health Center, private practice)
 4. Progress toward or achievement of National Committee for Quality Assurance Patient-Centered Medical Home certification.
 - At baseline, practices did not have access to a pharmacist specific to the practice.
 - A physician champion was identified at each practice to assist the pharmacist with integration into the practice.
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Methods: Study Protocol

- The intervention involved partnering a pharmacist 1 day per week (0.2 full-time equivalent [FTE]) in the primary care practice
 - Pharmacists were required to participate in primary care using 3 strategies:
 1. Direct patient care
 2. Educating prescribers
 3. Population-based strategies
 - The pharmacists met by conference call for weekly discussions throughout the project.
 - Pharmacist interventions were entered into:
 - A) Health Insurance Portability and Accountability Act-compliant Assurance software (Medication Management Systems, Inc., Golden Valley, MN)
 - B) Or de-identified Microsoft Excel spreadsheets (Microsoft Corporation, Redmond, WA)
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Methods: Endpoints

Primary Endpoints:

- Description of the pharmacists' identified drug therapy problems
- Pharmacists' recommendations
- Estimated costs avoided

Secondary Endpoints:

- Classification of pharmacist recommendations
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Methods: Statistical Analysis

- There were no a priori hypotheses
- Analyses were conducted in Microsoft Excel 2010

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Results

TABLE 1. PRACTICE AND PHARMACIST CHARACTERISTICS

<i>Practice</i>	<i>Practice Type</i>	<i>Approx. Annual Visits</i>	<i>Rural/Urban*</i>	<i>Practice Ownership</i>	<i>Pharmacist Type</i>	<i>Pharmacist employed by same organization as practice</i>
1	Internal Med Resident	23,000	Urban	University hospital	Hospital	Yes
2	Internal Med	22,500	Urban	University hospital	Hospital	Yes
3	Family Med Resident	30,000	Urban	University hospital	College of Pharmacy Faculty	No
4	Family Med	19,100	Rural	Critical access hospital	Hospital	Yes
5	Family Med	12,200	Rural	FQHC	Community	Yes

*Rural definitions: Office of Rural Health Policy at the Health Resources and Services Administration. List of Rural Counties and Designated Eligible Census Tracts in Metropolitan Counties. <ftp://ftp.hrsa.gov/ruralhealth/Eligibility2005.pdf> Accessed: March 14, 2014. FQHC, Federally Qualified Health Center.

- Seven sites and 8 pharmacists enrolled (at 1 site 2 pharmacists shared the 0.2 FTE)
- 5 sites included in final analysis
- Two sites were excluded because they contributed less than 6 months of data to the project
- One site was excluded because it had difficulty developing the needed relationship and scope of pharmacist activities to successfully collect meaningful data.

Results: Primary Outcomes

Drug therapy-related problems

- The pharmacists identified 708 drug therapy problems

Pharmacists' recommendations were accepted by prescribers 86% of the time

TABLE 2. PHARMACIST-IDENTIFIED DRUG THERAPY PROBLEMS

<i>Drug Therapy Problem</i>	<i>N (%)</i>
Dosage Too High	150 (21.2)
Nonadherence	105 (14.8)
Unnecessary Drug Therapy	100 (14.1)
Specific Interventions Missing (eg, curbside consult)	96 (13.6)
Different Drug Needed	72 (10.2)
Education Needed	53 (7.5)
Additional Drug Therapy Needed	50 (7.1)
Drug Information Question	39 (5.5)
Adverse Drug Reaction	24 (3.4)
Dosage Too Low	19 (2.7)
Total	708 (100)

Results: Primary Outcomes

Cost avoidance

- The recommendations resulted in an estimated \$373,092 of avoided costs.
- The results suggest that \$2.11 in cost was avoided for every \$1.00 spent on a pharmacist (\$373,092/\$176,690).

TABLE 4. COSTS AVOIDED		
<i>Recommendations</i>	<i>Costs Avoided per Recommendation</i>	<i>N</i>
Manage an untreated diagnosis	\$1923.08	61
Prevent or manage an adverse drug event	\$696.94	128
Average of any intervention	\$568.21	168
Manage a drug interaction	\$412.18	54
Adjust a dose or frequency	\$375.77	100
Reduce duplication of therapy	\$175.53	1
Discontinue a drug not indicated	\$94.92	117
Provide information only	\$0.00	30
Total		659
Reference for cost data: Lee AJ, Boro MS, Knapp KK, Meier JL, Korman NE. Clinical and economic outcomes of recommendations in a Veterans Affairs medical center. Am J Health Syst Pharm. 2002;59:2070–2077.		

Results: Secondary Outcomes

Classification of pharmacist recommendations

- The drug therapy problems were classified according to recommendations made to prescribers

TABLE 3. EXAMPLES OF PHARMACIST RECOMMENDATIONS

Recommendation	Example
Untreated diagnosis	Patient on simvastatin 80 mg for longer than 1 year. Patient's LDL has not been at goal of <100 since 2008. Recommended to change to a more potent statin (rosuvastatin 10 mg daily). This change was made. Repeated lipid panel 3 months later revealed LDL = 80.
Prevent or manage adverse drug event	Enoxaparin dose unclear. The discharge instructions stated 50 mg twice daily and patient was on 120 mg once daily in the hospital. Based on patient's weight and renal function, 40 mg once daily is recommended for DVT prophylaxis. Specialist physician adjusted the dose to 40 mg once daily.
Average of any intervention	85-year-old female. Reviewed med list with patient. Patient admits to regularly taking all meds each day and understands indications. Answered questions regarding losartan and association with increasing potassium (including potassium content in foods).
Avoid drug interaction	Patient on simvastatin 40 mg + gemfibrozil 600 mg twice daily. Lipid panel revealed TG = 265 (ranged from 210–350 since 2003). Patient also has uncontrolled diabetes that could be impacting TG control. Suggested discontinuing gemfibrozil. Gemfibrozil was discontinued.
Adjust dose or frequency	Suggested reassessment of zolpidem dose and duration of treatment. Consider decrease in dose to 5 mg. Physician decreased dose to 5 mg and is considering discontinuing.
Drug not indicated	Chart review did not reveal evidence of Zollinger-Ellison Syndrome, recurrent PUD, prevention of NSAID induced peptic ulcer, or GERD with esophagitis, ongoing symptoms, or complications such as Barrett's esophagus. Recommended tapering of patient's proton pump inhibitor. Physician agreed with the recommendation.
Information Only	Question from physician: How often is thrombocytopenia seen in patients on plaquenil that's attributable to the med? All medications in the 4-aminoquinoline class including plaquenil can cause thrombocytopenia. Most information is based on long-term use and FDA postmarketing reports. Thrombocytopenia occurs in approximately 1% of patients who take plaquenil.

DVT, deep vein thrombosis; FDA, Food and Drug Administration; GERD, gastroesophageal reflux disease; LDL, low-density lipoprotein; NSAID, nonsteroidal anti-inflammatory drug; PUD, peptic ulcer disease; TG, triglycerides.

Discussions and Conclusions

- The findings of this study support the growing body of evidence confirming the value of pharmacists' activities in primary care.
- Primary care providers should consider pharmacists well suited to offer direct patient care, population-based management, and education in their practices.
- Pharmacist inclusion is feasible, prevents adverse drug events, reduces costs, and improves patient outcomes.
- The most successful sites included specialty-trained academic pharmacists and pharmacists employed by the same organization as the practice

Reported limitations:

- Data regarding prescriber acceptance of interventions and long-term outcomes are incomplete.
 - Patient denominators as well as most patient characteristics are unknown because de-identifiers utilized across organizations
 - Only 5 practices included
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Critique: General

Positives:

- Title and abstract reflect study findings
- Provides relevance for study and cites rationale based on previous studies
- The principal investigator (AK) and a coauthor (CM) independently reviewed each pharmacist intervention and assigned the codes and categories. Discrepancies were resolved through discussion among the coauthors.

Negatives

- Abstract only mentions 2 out of the 3 main measures (excludes pharmacists' recommendations)
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Critique: Study Design

Positives:

- Pharmacist inclusion criteria clear

Negatives

- Convenience sample is not representative of the larger population leading to potential biases in the results
 - Study protocol vague
 - Pharmacists' efforts varied by location and left to the discretion of the pharmacist and physician champion in each practice
 - Secondary endpoints not well defined
 - Primary care practice inclusion/exclusion criteria not clear
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Critique: Results/Discussion

Positives

- Recognized limitations of their study
- All results were clearly reported in tables
- Utilized other studies to support their findings

Negatives

- Interpretation of study findings not clear
 - Gaps in data - Missing acceptance data for 350 out of 708 pharmacist recommendations
 - Total number of patients encountered unknown
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