Asthma Friendly Pharmacies: A Model to Improve Communication and Collaboration among Pharmacists, Patients, and Healthcare Providers

Tricia M. Berry, Theresa R. Prosser, Kristin Wilson, and Mario Castro

ABSTRACT *Pharmacists, with expertise in optimizing drug therapy outcomes, are valuable components of the healthcare team and are becoming increasingly involved in public health efforts. Pharmacists and pharmacy technicians in diverse community pharmacy settings can implement a variety of asthma interventions when they are brief, supported by appropriate tools, and integrated into the workflow. The Asthma Friendly Pharmacy (AFP) model addresses the challenges of providing patient-focused care in a community pharmacy setting by offering education to pharmacists and pharmacy technicians on asthma-related pharmaceutical care services, such as identifying or resolving medication-related problems; educating patients about asthma and medication-related concepts; improving communication and strengthening relationships between pharmacists, patients, and other healthcare providers; and establishing higher expectations for the pharmacist's role in patient care and public health efforts. This article describes the feasibility of the model in an urban community pharmacy setting and documents the interventions and communication activities promoted through the AFP model.*

KEYWORDS *Asthma, Community pharmacy, Pharmacists, Pharmaceutical care, Collaboration, Communication*

INTRODUCTION

Healthy People 2010 (HP 2010)^{1,2} targets several areas for improving asthma outcomes, including reducing asthma-related hospitalizations and urgent care visits and increasing the proportion of persons receiving asthma care consistent with the National Asthma Education and Prevention Program (NAEPP) guidelines.³ Studies in the United States have documented that pharmacists can positively impact outcomes identified as HP 2010 targets by educating patients and addressing medication-related problems. Pharmacists who have extensive training in pharmacotherapy and patient counseling are readily available to the public (i.e., no need for appointments or fees for a brief consultation in the pharmacy) and have access to individual patient drug-usage data. Intensive interventions by clinic-based pharmacists have been shown to decrease hospitalizations,^{4–6} decrease emergency department (ED) visits,^{5,6} and improve quality-of-life scores.⁶ These clinic-based

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pharmacist asthma interventions consisted of multiple appointments with dedicated time for asthma education.

The few reports describing and evaluating models of asthma interventions by community pharmacists⁷⁻⁹ involved fairly intensive interventions reaching only a small group of patients. Patients were required to enroll in the program and schedule a series of 20- to 30-minute appointments. The pharmacist maintained separate records to document data, interventions, and results. Pharmacist participants found that this model increased staff workload, was inconsistent with the usual dispensing workflow, and required significant additional training. In addition, pharmacist activities were relatively isolated from the healthcare providers writing prescriptions. Consequently, the reported number of patients affected by an individual pharmacy was small (e.g., fewer than ten at some pharmacies), and the number of pharmacists adopting or maintaining the models was limited. Moreover, these studies had mixed results: one⁹ showed a decrease in emergency visits and hospitalizations, improved asthma control, and cost savings; another⁸ showed an increase in patients' peak expiratory flow values and satisfaction with pharmacist-provided care, but no improvement in quality of life and an increase in the total number of breathing-related ED visits.

With approximately 250 million people entering a community pharmacy every week,¹⁰ community-based pharmacists have vast, largely untapped potential to deliver educational messages and address asthma-related medication problems. However, barriers to harnessing this potential are significant. The typical community pharmacy's workflow focuses on dispensing a drug product with brief patient contact. In addition, communicating with providers by phone is indirect and inefficient to resolve medication-related issues.

The authors conducted a survey¹¹ of community pharmacists in the St. Louis metropolitan area during the planning phase of the Controlling Asthma in St. Louis (CASL) project, one of the seven Controlling Asthma in American Cities projects funded by the Centers for Disease Control and Prevention. Project planners identified pharmacists as potential partners for increasing communication and linkages between different parts of the fragmented healthcare system. Survey responses revealed that pharmacists were interested in participating in CASL and in studying the feasibility of an area-wide model that integrated brief asthma interventions for all patients with respiratory prescriptions into the routine workflow of community pharmacies. Implementation, however, faced several challenges: (1) the need for pharmacist and technician education, (2) a lack of patient education materials, (3) staffing and workflow constraints, and (4) a need for administrative support. The Asthma Friendly Pharmacy[®] (AFP) model was specifically designed to overcome these barriers as well as the limitations experienced by previous programs.

METHODS

Model Design. The AFP protocol was reviewed and approved by the Institutional Review Committee at St. Louis College of Pharmacy. The goal of the AFP model was to use, at each step of the dispensing process, both pharmacists and technicians to effectively and efficiently deliver routine, brief (i.e., 3–5 minute) interventions to all patients (adults and children) with inhaled-medication prescriptions. Table 1 lists the AFP model interventions, which were selected from the NAEPP guidelines based on their relative importance for promoting positive asthma outcomes, consistency with

TABLE 1 Asthma-Friendly Pharmacy® model interventions

Pharmacist communicates/intervenes with primary care provider when:
Medication refill pattern indicates
–Overuse of short-acting beta-agonists (quick relievers)
–Non-adherence to/need for controller medication
–Salmeterol or formoterol without a controller (monotherapy)
Adverse effects of prescribed medications are identified or suspected
Smoking cessation is advised
Over-the-counter or prescription smoking cessation aid is recommended
Holding chamber or spacing device for metered-dose inhaler is recommended
Asthma action plan is needed
Oral corticosteroids were prescribed by emergency/urgent care
Pharmacist provides patient education to:
Explain the role of medications (i.e., role of quick relief vs. long-term controller)
Emphasize the correct medication regimen and importance of adherence
Assess/review respiratory device technique
Explain or assess understanding of asthma action plan
Provide smoking cessation counseling
Recommend strategies to avoid/minimize adverse effects of prescribed medications
Reinforce post-emergency/urgent care follow up with primary care provider

pharmacist education and role, and ease of integration into the typical community pharmacy workflow. A pharmacist’s appropriate role is the monitoring and promotion of proper asthma medication use. Medications, such as short-acting beta agonists that provide quick relief of asthma symptoms (relievers) should be available to and carried by all children with asthma. Overuse of relievers (monthly refills or more than one canister per month) indicates poor control and suggests the need for a preventive medication to reduce airway inflammation (controller medications), most commonly inhaled corticosteroids. Certain medications (salmeterol or formoterol) should only be taken with an inhaled corticosteroid and not alone (monotherapy). Because pharmacists are in a position to observe medication use, one of their important functions is the identification of refill patterns indicating inappropriate use and the notification of healthcare providers. Furthermore, some inhaled asthma medications require a separate spacing device to ensure delivery of the medication to the lungs. Pharmacists can recommend prescription of these devices and demonstrate their appropriate use. The AFP model did not limit these interventions to patients with asthma because some interventions, such as education on device technique or smoking cessation, applied to patients with other indications.

The AFP workflow design (Figure 1) integrated AFP interventions into the typical community pharmacy workflow with adaptation to individual pharmacy needs. New intra-pharmacy tools facilitated communication between technicians and pharmacists on different shifts. For example, the AFP model introduced a “bag tag” reminder for completed prescriptions to indicate the need for communication with the pharmacist at the time of pick-up. A fax template (Figure 2) that could be individualized for each pharmacy was created to facilitate more efficient, effective communication and collaboration with healthcare providers. The pharmacist could use the template to send to the patient’s healthcare provider information about medication use, problems noted, and indications for a new prescription (e.g., a new controller), when needed. The physician could, at a convenient time, write a

FIGURE 1. Asthma Friendly Pharmacy general workflow.

new prescription in the form's designated area and fax it back to the pharmacy. The fax served as a legal prescription when returned with the necessary information.

Model Partners. The Saint Louis University Health Communication Research Laboratory helped to develop child-oriented patient education materials, such as

Asthma Friendly Pharmacy®

4588 Parkview Place • St. Louis, MO 63110

(314) 367-8700 • Fax (314) 367-2784

To (physician): _____**Date:** _____**Re:** Patient name: _____

Address: _____

Phone: _____

DOB: _____

As an asthma friendly pharmacy, we are committed to providing the highest level of pharmacy services to our patients with asthma. It is our goal to work with you and the patient to ensure safe and effective medication use. Based on the review of the patient's profile and/or a discussion with the patient/caregiver, the following issue(s) regarding his/her asthma therapy have been noted.

Patient's Name: _____ Date: _____

PLEASE REVIEW AND REPLY TO THE PHARMACY.**Please consider prescribing a:**

- ☐ Spacing device
☐ Long-term controller regimen (e.g., an inhaled corticosteroid, leukotriene modifier)
☐ Smoking cessation aid (e.g., bupropion)

R_x_____
*substitution permitted*_____
*dispense as written***PLEASE REVIEW - REPLY IF PHARMACIST'S ACTION IS NEEDED.****INCLUDE IN PATIENT'S CHART PER CLINIC DOCUMENTATION PROCEDURE.**

- ☐ The patient is not currently aware of an asthma action plan (AAP) prescribed. For your convenience, I have attached an AAP. If you would like the patient to receive education on this plan with the standard medication counseling provided, please complete the AAP and return to the pharmacy fax number above.
- ☐ Potential overuse of short-acting beta-agonist noted _____
- ☐ Potential non-adherence to a prescribed long-term controller regimen identified _____
- ☐ Patient education on appropriate device provided ☐ MDI ☐ DPI ☐ Spacing device ☐ Peak flow meter
 Demonstrated technique was: ☐ Poor/inadequate ☐ Acceptable ☐ Excellent
- ☐ Potential medication side effect noted _____
- ☐ The AAP was reviewed as requested _____
- ☐ Smoking cessation was advised for: patient / household member _____
- ☐ OTC nicotine replacement recommended _____
- ☐ Prednisone prescribed by ED/urgent care/hospital provider _____

This fax is intended only for the use of the individual or entity to which it is addressed and may contain information that is privileged, confidential, or exempt from disclosure under applicable law. Any distribution, dissemination, or copying of this communication by anyone other than the intended recipient is strictly prohibited. If you have received this information in error, please immediately notify us by telephone. Receipt by anyone other than the intended recipient is not a waiver of any attorney/client or work-product privilege.

FIGURE 2. Asthma Friendly Pharmacy® fax template.

bookmarks and stickers, to offer brief, timely, consistent AFP-related messages (e.g., Message of the Month) and promote communication between pharmacists and individuals with asthma. These culturally appropriate materials, written at a fourth-grade reading level, were provided to children, adolescents, and adults with asthma and caregivers of children with asthma. Specially designed marketing materials, including

AFP brochures, pledge plaques, and window logo decals, alerted patients to the pharmacy's participation in the AFP model and the specific services offered. The plaques were strategically located in the pharmacy counseling, dispensing, or waiting areas; the window decals and logos were posted near the pharmacy counter, at the drive-through window, and by the front door. Brochures were stapled to prescription bags and also distributed at health fairs, other outreach events, and Community Asthma Program (CAP) physician sites.¹² CAP, which is also part of CASL, is a St. Louis-based intervention to help primary care physician practices implement the NAEPP guidelines. The CASL program, including AFP and CAP, targeted St. Louis City and three adjacent urban zip codes based on statewide data showing the highest rates of ED visits and hospitalizations for people with asthma. These zip codes also corresponded to the lowest income areas in the region.

The AFP model linked closely with the St. Louis College of Pharmacy's experiential program. Pharmacy students received orientation to and participated in the AFP model during community pharmacy-based experiential curricular requirements. Pharmacist participants were recruited from a pool of existing preceptors and others eligible to become preceptors for the college's experiential programs. Participation as a preceptor in the experiential program, however, was not required for enrollment in the AFP model. In many cases, pharmacists were recruited based on their practice location (e.g., practicing near a CAP physician site or within a CAP clinic pharmacy). Interested pharmacists in other parts of the St. Louis metropolitan area (Missouri and Illinois) participated as well. Chain pharmacy administrators, after learning about the AFP model, identified potential pharmacies and pharmacist champions to spearhead implementation efforts at their respective sites.

Training. Initially, AFP leaders at St. Louis College of Pharmacy provided a 3-to-4-hour orientation to groups of pharmacist champions from individual sites. Content included a description and logistics of the AFP model, rationale and background of AFP interventions, and communication strategies for brief, effective patient interactions and messages. As the model matured, AFP training for pharmacist champions was integrated into routine pharmacist-preceptor development and training for the St. Louis College of Pharmacy experiential programs.

Pharmacist champions were also invited to participate in training programs for local primary care providers implementing CAP. A secondary goal of these face-to-face contacts between pharmacists and physicians was to encourage these healthcare professionals to appreciate the potential for complementary interaction between CAP and AFP. The AFP leaders oriented CAP physician providers to the AFP fax form to explain the importance of pharmacist communication in achieving desired asthma outcomes.

All other pharmacist and technician staff at each site received 30- to 60-minute training sessions designed to orient staff and adapt the workflow model for the specific pharmacy. AFP leaders scheduled additional onsite follow-up sessions as needed to promote model implementation and institutionalization.

Data Collection. Each pharmacy site used a data collection form (Figure 3) to record the weekly numbers and types of interventions. Sites submitted forms weekly or monthly, depending on sites' preference, by mail or fax to the AFP-model leaders, or occasionally AFP-model leaders picked up documentation forms during site visits.

EDUCATIONAL ACTIVITY	MON	TUES	WED	THURS	FRI	SAT	SUN	TOTALS
Number of patients/time spent (minutes)								
Role of medications								
Medication regimen								
Compliance aids								
Metered dose inhaler (MDI) / dry powder inhaler (DPI) device technique								
Nebulizer technique								
Spacing device (w/MDI) technique								
Peak flow meter usage								
Asthma action plan (AAP)								
Smoking cessation – advised to quit								
Smoking cessation – over-the-counter (OTC) therapy recommended								
Side effects/strategies to avoid								
Post-hospitalization /Emergency department follow-up with PCP (primary care provider)								
Other								
TOTALS

ASTHMA FRIENDLY PHARMACY

Pharmacy Site: _____

Week of: _____

FOR AFP LEADER USE ONLY

Entered: _____

Date: _____

COMMUNICATION WITH PHYSICIANS (FAXES)	MON	TUES	WED	THUR	FRI	SAT	SUN	TOTALS
Need for spacing device								
Need for a controller regimen								
Smoking cessation – prescription therapy requested								
Need for asthma action plan								
Potential over use of short-acting beta-agonist (SABA)								
Nonadherence to controller regimen								
Salmeterol monotherapy identified								
Documentation of device/AAP education								
Potential side effects noted								
Smoking cessation advised								
OTC nicotine therapy recommended								
Prednisone prescription identified								
Other								
TOTALS

ASTHMA FRIENDLY PHARMACY

Pharmacy Site: _____

Week of: _____

FOR AFP LEADER USE ONLY

Entered: _____

Date: _____

FIGURE 3. Intervention documentation form.

A pharmacy student assistant or staff member entered the data into the AFP Access database. Data were summarized by site, time period, and intervention type for inclusion in reports to key stakeholders, such as CDC, corporate participants, and individual participating pharmacy sites. During their site visits, the AFP model

leaders gave site staff feedback about the pharmacy’s interventions to help them appreciate the cumulative effect of documentation. In addition, electronic and mail AFP newsletters, sent at 1- to 3-month intervals, encouraged pharmacist champions to continue participation and record interventions.

Resources. Two AFP leaders [0.2–0.3 total full-time equivalents (FTEs)] developed and oversaw AFP model implementation. Duties included pharmacy participant recruitment, AFP tool and education material development, initial group training for champions, and onsite staff training and follow up. Approximately halfway through the funding period, a consulting pharmacist (0.1–0.25 FTE) was added to assist with site visits and peer training. Additional expenditures included \$25,000 for the development of pharmacy staff education materials, including patient asthma messages and a training video; \$3,000–\$4,000 per year for pharmacy staff incentives, such as \$25–\$50 for food during pharmacy site visits; and \$2,000–\$10,000 annually for marketing materials such as brochures and media placements.

RESULTS

Of the 47 pharmacist champions, 86 pharmacists, and 104 pharmacy technicians at 65 pharmacies trained on the AFP model, 30 (64%) pharmacy champions, 64 (74%) pharmacists, and 91 (88%) technicians met the definition of “actively participating” (i.e., providing intervention data) in the AFP model at the end of the 5-year project period (Table 2). During the last 3 years of the project, 429 pharmacy students were trained and participated in the AFP model during their experiential rotations.

From 2002–2008, 42 pharmacies (2 independent, 2 clinic, 23 chain, and 15 grocery) submitted data on patient and pharmacist interventions, documenting a total of 2,419 patient and 1,284 provider interventions. As shown in Figure 4, the total number of interventions recorded increased each year with a dramatic shift in the ratio of patient to provider interventions observed in year 5.

AFP staff tracked the content of education messages and the types of intervention provided by pharmacists. Patients most frequently received education on the role of the medication (controller vs. quick relief), the medication regimen,

TABLE 2 Number and types of participants trained and active in the Asthma Friendly Pharmacy® model

Participant type	Total trained, <i>n</i>	Active at model’s end, ^a <i>n</i> (%)
Pharmacist champion ^b	47	30 (64)
Other pharmacists ^c	86	64 (74)
Pharmacist technician ^d	104	91 (88)
Pharmacy	65	25 ^e (45)

^aActive participation at end required submission of intervention data in the last year of the model
^bEach site identified a pharmacist champion who participated in initial orientation and training and spearheaded the implementation at the pharmacy
^cOther pharmacists included non-champion pharmacists on staff at the pharmacy who received orientation to AFP processes
^dPharmacy technicians are support staff within the pharmacy who were also trained on AFP processes
^eFrom 2002–2008, 42 different pharmacies (80%) submitted data on patient and pharmacist interventions at some point during the project period

FIGURE 4. Asthma Friendly Pharmacy® patient and provider interventions per year.

device technique, and side effects (Figure 5). The most common provider interventions (Figure 6) addressed the following specific medication-related concerns: overuse of short-acting beta-agonists; non-adherence to prescribed controller medications; the need for a controller medication; and the need for follow up on prednisone prescriptions after hospitalization, ED, or urgent-care visits for asthma exacerbations. Responses from providers to these faxes were not tracked. Many provider interventions were categorized by the pharmacists as “other.” Because such high use of this category was unexpected, details about these interventions was not requested prospectively. Upon retrospective review, it is likely that many of these issues related to barriers to medication acquisition and third party payment (e.g., formulary, authorization for extra quick relief medication at school, or approval for a spacing device) that were resolved by the pharmacist.

FIGURE 5. Asthma Friendly Pharmacy®: Number and type of patient education interventions 2002–2008.

FIGURE 6. Asthma Friendly Pharmacy®: Number and type of provider interventions 2002–2008.

DISCUSSION

The AFP model sought to overcome the challenges encountered by earlier pharmacy-based programs while taking into account motivators and needs communicated by St. Louis area community pharmacists. This approach effectively integrated routine, brief asthma interventions into the daily community pharmacy workflow, increased exchanges between pharmacists and providers, successfully reached a large number of patients, and initiated and maintained a network of AFP pharmacies over its 5 years.

The successful implementation and maintenance of the AFP model benefited from a strong partnership with substantial, ongoing support from St. Louis College of Pharmacy's experiential program. This partnership offered a mechanism for identifying potential pharmacist champions and sites, and for implementing and sustaining training. In addition, pharmacy students' participation in the AFP model during their required community pharmacy-based education and training offered additional staffing and support for AFP interventions.

The FTE resources allocated to coordination were small and split between two or more people who had multiple other responsibilities, limiting the reach of the model and its structure. In addition, pharmacy staff turnover and transfers were considerably greater than anticipated. The transfer of a pharmacist champion could result in either the loss of an AFP site or the addition of a new one, requiring significant training for staff at sites new to the model and for new pharmacists at existing sites. Frequent orientation sessions were required to accommodate other new hires. These continuing changes led to the development of a pilot training video and plans for online modules and a more comprehensive training video.

Although recording and reporting intervention data required minimal effort, pharmacy personnel were unaccustomed to tracking AFP productivity data. Consequently, significant under-reporting of interventions is suspected.

Why the ratio of patient to provider interventions changed over time is unknown (Figure 4). Data were self-reported by participating pharmacists and

pharmacy students, and individual participants changed significantly over time. While some participant change was due to pharmacy staff, most was attributable to pharmacy student rotation through AFP sites during the students' 5-week experiential assignments. Differences between the approaches of pharmacy students and pharmacists might also have affected the type of intervention. Changes in implementation at the sites over time, such as increased comfort level with integrating the model into workflow, a higher percentage of pharmacy students participating in the model and submitting interventions, or more complete documentation of provider interventions, might also have had an impact.

Several lessons may benefit others interested in adapting this model. Obtaining corporate or administrative buy-in was essential to the institutionalization of the model at chain or grocery store pharmacies. Shifting the philosophy of community pharmacy practice from a product focus to a patient-and-clinical focus required the modification of pharmacy staff processes, behaviors, and attitudes. A pharmacist champion at each site was critical to developing initial enthusiasm for the model, planning a site-specific workflow, orienting staff, and reinforcing procedures to encourage long-term behavior change. Implementing and sustaining the model and tracking model processes at individual sites required initial training and onsite follow-up sessions provided by facilitators who could structure, adapt, and reinforce activities.

An AFP leader was needed to promote and coordinate the overall model, provide initial and ongoing training, reinforce and encourage necessary long-term behavior changes, and supply quarterly feedback reports. Having an AFP leader who was a member of, or worked with members of, the experiential program at the college of pharmacy contributed to the integration of the AFP model into the experiential curriculum. A minimum 0.5 FTE who can dedicate a majority of effort to the model is recommended.

The purpose of AFP was to evaluate the feasibility of implementing an area-wide model using community pharmacists to provide brief asthma interventions. Potential areas for future evaluation include the following: (1) the effect of AFP model interventions on asthma outcomes; (2) acceptance of pharmacist interventions by providers and patients; (3) pharmacist and technician participant satisfaction with the model; (4) changes in the frequency, efficiency, and effectiveness of relationships, expectations, or communication between pharmacists and prescribers or pharmacists and patients; (5) measurement of the model's productivity (e.g., ratio of potential to actual interventions provided); and (6) characteristics of pharmacies and pharmacists who implement the model successfully. Whether the pharmacy students exposed to this model of practice during training will be more likely to adopt a more patient-focused model of practice throughout their career is another unknown. Finally, the application of this general AFP model to other diseases (e.g., hypertension, diabetes) and the expansion of the pharmacist's role to other patient-focused activities are other areas for further exploration.

The AFP model aligns well with rotation goals of the St. Louis College of Pharmacy program and is on the road toward institutionalization. Training community pharmacist preceptors and students in AFP processes continues, with close interaction with college faculty. All student pharmacists in their final year participate in the AFP model during a required 5-week community pharmacy rotation. While at the community pharmacy site, students are expected to work with pharmacist preceptors to identify and document the asthma-related patient interventions listed in Table 1. Many ongoing expenses associated with training staff will be integrated into the

experiential program office's training budget. The AFP model is seeking additional funding from a state foundation to expand beyond its current catchment area.

CONCLUSION

The AFP model provides a template for a structured community pharmacy-based patient-care experience that can be integrated into the curriculum of other colleges of pharmacy. This approach can be adapted to a variety of community pharmacy settings (e.g., chain, grocery, independent pharmacies). Moreover, because many of the asthma interventions, such as correct respiratory device technique, adherence to inhaled corticosteroid medications, and tobacco cessation, apply equally to chronic obstructive pulmonary disease, the model could be extended to that population as well.

ACKNOWLEDGEMENT

This project was supported through a cooperative agreement with the Centers for Disease Control and Prevention, US Department of Health and Human Services, under program announcement 03030.

Disclaimer. The findings and conclusions in this manuscript are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

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