

The Coulee Region Community Pharmacy Asthma Intervention Study

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Asthma, an inflammatory airway disease, ranks among the most common chronic medical conditions in the United States, one that has created significant public health concern over the past two decades. In the United States, 7.7% of the total adult population had asthma in 2003.¹ In that same year, the prevalence of asthma in adults living in Wisconsin totaled 7.5%, slightly lower than the national rate but higher than many other states.¹

In 1998, the National Heart, Lung, and Blood Institute estimated indirect and direct monetary costs for asthma totaling \$11.3 billion. Indirect costs, estimated at \$3.8 billion, accounted for costs related to morbidity and mortality. The national mortality rate in 2002 was 1.5 per 100,000 people; this compares with a slightly higher rate of 1.85 per 100,000 people in the state of Wisconsin.² Estimated direct costs total \$7.5 billion, with one half of costs generated by emergency department visits and hospitalizations. According to the Centers for Disease Control and Prevention, in 2004 asthma contributed to 1.8 million emergency department visits, one million hospital outpatient department visits, 13.6 million visits to office-based physicians, and 3,780 deaths. The financial burden of asthma management in Wisconsin is estimated to be roughly \$209 million annually, with \$90 million accounting for indirect expenditures and \$119 million accounting for direct medical expenditures.²

To combat the increasing financial and public health burden attributable to asthma, the National Asthma Education and Prevention Program (NAEPP) has called on pharmacists to assist with helping patients gain control of their asthma symptoms. NAEPP has released specific recommendations for community pharmacists in an effort to provide direction for pharmacy practices patient education about asthma medications; instruction about proper technique for inhaling medications; monitoring medication use and refill intervals to identify patients with poorly controlled asthma; deterrence from purchasing nonprescription inhalers and instead encouraging such patients to seek medical care; appropriate peak flow meter use; and increasing patient comprehension and use of asthma management plans.³

Considering the significant burden of asthma in Wisconsin and the call from the NAEPP for community pharmacist assistance in controlling this burden, we designed a study to examine the utility of telefacsimile communication between community pharmacists and health care professionals regarding excessive use of short-acting beta agonists (SABAs).

Abstract

Objective. To determine whether community pharmacist-initiated interventions containing a recommendation to adjust prescribed asthma therapy are more helpful to prescribers than similar communications without such a recommendation.

Design. Prospective, multicenter, quasi-experimental design with posttest.

Setting. Wisconsin and Minnesota.

Patients and Participants: 33 community and clinic pharmacies throughout the Coulee Region of Wisconsin and Minnesota enrolled eligible patients from October 1, 2004, to January 31, 2005. Patients were between 12 and 60 years of age, had used three or more short-acting beta-agonist (SABA) canisters within the previous 90 days, and did not meet any exclusion criteria.

Interventions. Based on an evaluation of each patient's inhaler technique and adherence to controller medications, pharmacists sent to the prescriber a fax containing a recommendation (for patients with proper technique and appropriate adherence to prescribed controller medications) or information (for those who had any combination of inappropriate inhaler technique or inappropriate adherence).

Main Outcome Measure. Health care professionals' yes-or-no response to the question, "Do you find this form helpful for making clinical decisions?"

Results. Pharmacists offered to enroll 235 patients who were identified as meeting preliminary inclusion criteria. Of those, 112 people met exclusion criteria, 28 were not interested in their pharmacists' involvement, 13 stated that they did not have time to participate, 11 took the forms home but did not return them, and 11 other patients were excluded by the pharmacists for other reasons. The remaining 60 patients were enrolled in the study, 60 faxes were sent from 16 pharmacies, and 40 of those were analyzed further. For 24 recommendation faxes sent, prescribers rated 15 as helpful (62.5%) and 4 as not helpful (16.7%). Of 16 informational faxes sent, 10 were marked helpful (62.5%) and 2 were marked not helpful (12.5%).

Conclusion. Recommendation and informational faxes were overall helpful to health care professionals in making clinical decisions. Respondents found the two types of faxed interventions as equally helpful, suggesting that pharmaceutical care initiated by community pharmacists is helpful to prescribers.

Keywords. Asthma, community and ambulatory pharmacy, prescribers, communications, technology, adherence, patient education.

OBJECTIVE

The purpose of this study was to determine whether community pharmacist-initiated interventions containing a recommendation to adjust prescribed asthma therapy are more helpful to prescribers than similar communications without such a recommendation.

METHODS

Design/Setting

The Coulee Region Community Pharmacy Asthma Intervention Study was conducted as a prospective, multicenter, quasi-experimental study with a posttest design. The study, approved by two local institutional review boards, was conducted over a four-month period from October 1, 2004, to January 31, 2005, in the Coulee Region of Wisconsin and Minnesota. Of 48 community and clinic pharmacies located in this area, 33 agreed to participate in the study.

Pharmacist Training

Before the study began, pharmacists and pharmacy technicians who agreed to participate attended a training session during which they were introduced to the study protocol. Discussions centered on the latest guidelines in asthma treatment, including new concepts in asthma treatment and how community pharmacists can assist in controlling the asthma burden. A refresher demonstration on proper technique of inhaler devices was performed to ensure everyone was up to date. Most of the training session focused on how to properly incorporate study interventions into daily practice.

Pharmaceutical Care Interventions

Patients who refilled their SABAs three or more times within the previous 90 days were identified through drug use reviews by participating pharmacists. Each patient's prescription profile was examined for patients' age, use of oral steroids, and refills for SABAs. If a patient had refilled their SABAs three or more times in the previous 90 days, was between 12 and 60 years of age, and was not taking oral steroids regularly (daily or every other day), the community pharmacist offered to enroll the patient in the study.

Patients who agreed to participate were given a description of the study and methods, two copies of an informed consent document (one signed copy for the pharmacist's records and one copy for the patient), and a demographic survey. Upon completion of the informed consent and demographic survey, the pharmacist verified that the patient did not meet any of the remaining exclusion criteria, including needing an inhaler refill because of loss or need for a back-up, or presence of one or more of several lung abnormalities (chronic obstructive pulmonary disease [COPD], emphysema, bronchitis, bronchiolitis, upper airway obstruction/foreign body, pneumonia, tumor/neoplasm, pulmonary embolism, vocal cord dysfunction, lower respiratory tract viral infection, congestive heart failure, pulmonary fibrosis, cystic fibrosis, or structural lung conditions [one lung, pneumonectomy, lobectomy, partial lobectomy]).

If none of the exclusion criteria applied, the pharmacist evaluated the patient's inhaler technique. If the inhaler was not used correctly, the pharmacist counseled the patient on optimal technique.

At a Glance

Synopsis. Information and therapeutic recommendations about asthma care provided by pharmacists to prescribers via telefacsimile were helpful overall in clinical decision making, according to this study of 60 patients with poorly controlled asthma residing in Wisconsin and Minnesota. At 16 community and clinic pharmacies in the Coulee Region, pharmacists identified target patients by inspecting medication profiles for excessive use of short-acting beta-agonists or medication nonadherence and through direct observation of patients' inhaler technique. Recommendations to step up drug therapy were faxed to prescribers for patients who exhibited proper inhaler techniques and were adherent. Informational faxes were sent to professionals for patients who either demonstrated improper technique or were not adherent. Among responding health care professionals, 62.5% found each of the two types of communications to be helpful.

Analysis. The National Asthma Education and Prevention Program (NAEPP) recommends that pharmacists identify patients with poorly controlled asthma by monitoring patient medication use and refill intervals. Furthermore, pharmacists should assist patients with this common disease in gaining control of their symptoms through interventions including patient education on inhaler technique, medication and peak flow meter use, and asthma management plans. Pharmacist-initiated communication with patients' health care professionals by fax is a convenient means of communicating useful information in the busy community pharmacy settings, and results of this study indicate that the intervention was helpful to prescribers. The authors challenge colleagues nationwide to implement meaningful pharmaceutical care to help raise patients' and health care professionals' expectations regarding pharmacists' roles in health promotion.

In addition to observing inhaler technique, the pharmacist reviewed the patient's prescription profile to determine whether the patient was adherent to prescribed controller medications. The patient was considered adherent if two or more 30-day supply refills of at least one controller medication had been received within the past 90 days and nonadherent if fewer than two 30-day supply refills had been received within the preceding 90 days. Regardless of the predetermined definition of adherence, the pharmacist had the authority to classify the patient as adherent or nonadherent based on additional information (i.e., patient had been taking samples or doses had changed). Identification of nonadherent patients provided an opportunity to counsel on the importance of adherence to prescribed controller therapy. If the patient was not prescribed any controller medications, a classification of appropriate adherence was made.

Interventions

Pharmacists sent either a recommendation or informational fax to the patient's health provider, as outlined below.

Recommendation Faxes

The pharmacist recommended that the prescriber step up patients' scheduled drug therapy if these frequent users of SABAs exhibited proper technique of their SABA inhaler while their

refill record indicated appropriate adherence to prescribed controller medication. Such recommendations were made using a fax form (Figure 1) customized to each pharmacy that named the specific SABA involved and listed the patient's refill rate during the preceding 90 days for that medication. The form provided information on whether the patient had or had not been available for such a demonstration of inhaler technique, and if so, whether the patient had demonstrated proper or improper technique. The pharmacist was also able to provide information on appropriate or inappropriate adherence to prescribed controller medications and whether patients had received their prescriptions from multiple pharmacies.

As shown in Figure 1, the recommendation fax also included a snapshot of the current asthma guidelines and a listing of the preferred treatment based on the patient's asthma severity. A list of asthma medications the patient was currently taking was written in before the pharmacist signed the recommendation. The fax included a space for the health care provider to respond to the recommendation and indicated whether the form was deemed helpful or not.

Informational Faxes

The pharmacist sent an alternative informational fax (Figure 2) to the patient's health care provider for patients who exhibited any combination of inappropriate inhaler technique or adherence. This fax was similar to the recommendation fax mentioned above, the primary difference being that the pharmacist no longer recommended a step up in asthma therapy. Instead, this fax

stated, "I recognize that the patient's inhaler technique and/or adherence to controller medication(s) may be contributing to excessive use of SABA. Therefore, no recommendations at this time—information provided for your reference."

The form solicited health care provider feedback using the same questions as with the recommendation fax.

Documentation of Interventions

Pharmacists were required to document specific aspects of each intervention they performed. All patients who either declined to participate or met exclusion criteria were recorded on a log form. The pharmacist also recorded whether the patient exhibited proper inhaler technique and was adherent to prescribed controller medication(s), along with whether counseling was provided on optimal technique and importance of adherence to controller medication(s). Finally, a fax log recorded the date the original fax was sent to the health care provider, names of the patient and the recipient of the fax, the type of fax (either recommendation or informational), the initials of the pharmacist performing the intervention, and the date a response was received.

Measures

Data measuring the utility of pharmacists' interventions were collected from recommendation fax and informational fax responses (Figures 1 and 2). Results were tallied to fill in a distribution table comparing helpful versus not helpful for recommendation and informational faxes. Fisher's exact test calculated a probability value.

In addition, demographic information was obtained from completed surveys and from the pharmacist's evaluation of each intervention. Information concerning provider type and pharmacy characteristics was collected as needed throughout the study.

RESULTS

Pharmacists in 16 pharmacies offered to enroll 235 patients who were identified as meeting preliminary inclusion criteria (no patients were recruited in the other pharmacies). Of those, a total of 112 people met exclusion criteria: 61 were older than 60 years of age, 28 had COPD, and 23 potential enrollees did not meet other study criteria. Even though many of the remaining patients were willing to cooperate, 28 were not interested in their pharmacists' involvement, 13 stated that they did not have time to participate, and 11 took the forms home, stating they would return them at their next visit to the pharmacy, but none did. The pharmacist used professional discretion and excluded 11 other patients who they believed were not mentally capable of filling out the required survey.

For the remaining 60 patients, pharmacists acted on their assessments and the patient-supplied information by sending either recommendation or informational faxes to health care professionals.

Recommendation and Informational Faxes

Of the 24 recommendation faxes sent, 19 were returned and included in the probability calculation, with 15 (62.5%) prescribers coding the faxes as helpful and four (16.7%) as not helpful. The five other faxes were excluded from probability value calculation, specifically two (8.3%) faxes that were never returned and

FIGURE 1. RECOMMENDATION FAX FORM

Coulee Region Pharmacy Asthma Study
 Funded by The Wisconsin Asthma Coalition
 The Medicare Shoppe, 525 Cass St., La Crosse, WI 54601
 Phone: 608-784-3922 • Fax: 608-784-2242

Attention: _____ Date: ____/____/____
 Healthcare Provider: _____ Month: ____ Date: ____ Year: ____

Patient: _____ DOB: ____/____/____
 Last Name, First Name Month: ____ Day: ____ Year: ____

Based on my evaluation of the above patient, I have noticed an overuse of the following beta₂-agonist(s) _____ at a rate of _____ inhaler(s) per 90 days. Upon the patient's visit to the pharmacy I evaluated his/her inhaler technique and adherence to prescribed controller medication regimen.

Proper Technique _____ Inhaler Technique _____
 Appropriate Adherence to Controller Medications _____ Inappropriate Adherence to Controller Medications _____
 Patient not available for evaluation - Please consider review at next visit _____ Patient gets Rx's at multiple pharmacies _____

National Asthma Guidelines:

| | Days with Symptoms | Nights with Symptoms | Medications Required to Maintain Long-Term Care (Preferred Treatment) |
|---------------------|------------------------------|----------------------|--|
| Severe Persistent | Continuous | Frequent | High-dose inhaled corticosteroids & long-acting inhaled beta ₂ -agonist |
| Moderate Persistent | Days | ≥ 2 per month | Low to Medium dose inhaled corticosteroid & long-acting inhaled beta ₂ -agonist |
| Mild Persistent | ≥ 2 per week but < 2 per day | ≥ 2 per month | Low-dose inhaled corticosteroid |
| Mild Intermittent | ≤ 2 per week | ≤ 2 per month | No daily medication needed |

Source: (National Institutes of Health, 2002)

Based on guidelines from the National Institute of Health (NIH), I recommend that a step up in asthma therapy be implemented.
 Patient is currently taking: _____

(RP): Signature! _____

Healthcare Provider Response: Please choose one the following and fax back to 608-784-3922

Recommendation accepted - start with current pharmacy with new Rx _____
 Recommendation not accepted - Reason: _____
 I will have staff call and schedule an appointment with patient _____
 I will address your concerns at the patient's next scheduled visit on: _____
 Thank you for your input, but no change in therapy at this time _____
 Comments: _____

(Provider Signature) _____

Do you find this form helpful for making clinical decisions? Yes No

Thank you for your time and participation in this study!

three (12.5%) faxes that had no indication of the helpfulness of the recommendation.

Of the 16 recommendation faxes sent, 12 were returned and included in the probability calculation, with 10 (62.5%) prescribers coding the faxes as helpful and two (12.5%) as not helpful. The four other faxes were excluded from probability value calculation, specifically three (18.8%) faxes that were never returned and one (6.3%) fax that was without an indication of the helpfulness of the recommendation.

Combining the recommendation and informational faxes, 31 faxed interventions were analyzed further. Respondents indicated that 80.6% (n = 25) of these faxes were helpful.

No Response Rate

Pharmacists were encouraged to send second fax requests throughout the study as they felt necessary. However, even after two faxes, some health care professionals still did not respond. Overall, the study had a 12.5% nonresponse rate. The informational faxes were more likely to attract no response (18.8%) than were recommendation faxes (8.3%). The mean number of days required for health care professionals to respond to recommendation faxes was 7.94 days, compared with 12.16 days for informational faxes.

The utility of recommendation faxes was compared with the utility of informational faxes. Results showed 62.5% of recommendation faxes and 62.5% of informational faxes were helpful (P = .57, left-sided Fisher's exact test.)

Patient Factors

Of the 60 faxes sent to health care professionals, 24 (40.0%) provided recommendations for step-up therapy of asthma, and 16 (26.7%) were informational. Pharmacists sent the incorrect type of fax (i.e., recommendation instead of informational and vice versa) 8 times (13.3%) and sent faxes in error for 12 patients who met exclusion criteria (20%). These 20 incorrect faxes were excluded from final analysis (Figure 3).

Table 1 lists the demographics of 31 patients for whom faxes were sent during the four-month study period and analyzed here. Most patients were white, but otherwise the patients represented a broad swath of ages, education levels, smoking histories, and SABA refill rates, and the final sample was nearly evenly split along gender lines.

According to information provided on patient questionnaires and obtained in pharmacist assessments, 97% of patients stated that they knew how to use their inhaler properly (Table 2), and the pharmacist concurred for 84% of patients after they demonstrated their techniques. All but one patient stated that they had a good understanding of how their medications worked. Interestingly, 71% of these patients exhibited appropriate adherence to controller medications.

Pharmacists provided counseling about inhaler technique for 29% of the 31 patients. However, when the patient demonstrated improper technique, pharmacist counseling frequency increased to 75%. Likewise, counseling on the importance of adherence to prescribed controller medication(s) occurred 45% of the time. However, when the patient exhibited poor adherence, pharmacist counseling increased to 60%.

Health Care Professionals' Responses

The majority of the 31 analyzed faxes were sent to nonspecialty physicians, as shown in Table 1, but small numbers of faxes also went to nurse practitioners and specialty physicians (i.e., pulmonologists and allergists). There was no statistical trend between the nature of the fax sent to each type of health care professional.

According to the patient survey, specialty physicians were more likely to review the patient's inhaler technique (80%) than were nonspecialty physicians (35%) and nurse practitioners (20%). Collectively, 75% of health care professionals who reviewed inhaler technique at the patient's last visit marked either the recommendation or informational fax helpful. Regardless of the type of fax, specialty physicians rated the fax form as helpful 100% of the time, as did 86% of nonspecialty physicians and 40% of nurse practitioners.

Throughout the study, second fax requests sent by the community pharmacists were encouraged. None of these went to nurse practitioners, while 83% were directed to nonspecialty physicians, and 17% to specialty physicians. All responses received from second fax requests were marked as helpful.

DISCUSSION

This study was designed to identify patients who were using SABAs excessively and help them gain control of their asthma symptoms through pharmacist-initiated collaboration with the prescribing health professional. All patients enrolled were using their SABAs in excess, according to national asthma guidelines.

FIGURE 2. INFORMATIONAL FAX FORM

Coulee Region Pharmacy Asthma Study
 Funded by The Wisconsin Asthma Coalition
 The Medicine Shoppe, 528 Cass St., La Crosse, WI 54601
 Phone 608-784-5922 • Fax 608-784-2272

Attention: _____ Date: _____
 Healthcare Provider Month / Day / Year

Patient: _____ DOB: _____
 Last Name First Name Month / Day / Year

Based on my evaluation of the above patient, I have noticed an overuse of the following beta₂-agonist(s) _____ at a rate of _____ (inhaler(s)) per 90 days. Upon the patient's visit to the pharmacy I evaluated his/her inhaler technique and adherence to prescribed controller medication regimen.

Proper Technique: _____ Improper Technique: _____
 Appropriate Adherence to Controller Medication(s) _____ Inappropriate Adherence to Controller Medication(s) _____
 Patient not available for evaluation - Please consider review at next visit. Patient gives Rx's to multiple pharmacies.

| National Asthma Guidelines: | | | |
|-----------------------------|----------------------------------|----------------------------------|--|
| | Days with Symptoms Continuous | Nights with Symptoms Frequent | Medications Required to Maintain Long-Term Care (Preferred Treatment) |
| Severe/Persistent | | | High-dose inhaled corticosteroids & Long-acting inhaled beta ₂ -agonist |
| Moderate/Persistent | Daily | ≥ 5 per month | Low to Medium dose inhaled corticosteroid & long acting inhaled beta ₂ -agonist |
| Mild/Persistent | ≥ 2 per week but < 2 per day | ≥ 2 per month | Low-dose inhaled corticosteroid |
| Mild/Intermittent | < 2 per week | < 2 per month | No daily medication needed |

Source: (National Institutes of Health, 2002)

I recognize that the patient's inhaler technique and/or adherence to controller medication(s) may be contributing to excessive use of short-acting beta₂-agonists. Therefore, no recommendations at this time - information provided for your reference.

(HCP Signature)

Healthcare Provider Response: Please choose one the following and fax back to 608-784-2272

The patient's next appointment is scheduled for: _____

The patient does not have an appointment scheduled at this time. Thank you for the information.

I will have staff call and schedule an appointment with the patient.

Comments: _____

(Provider Signature)

Do you find this form helpful for making clinical decisions? Yes No

Thank you for your time and participation in this study!

Focus was placed on the most severely affected asthma patients, specifically those obtaining three or more canisters of SABAs per 90 days.

Information about the number of inhalers a patient uses per 90 days alone may not be an accurate representation of the need to contact the patient's health care provider with a recommendation to adjust existing drug therapy. We looked at two additional parameters before deciding to send either a recommendation or an informational fax: the patient's inhaler technique and the patient's adherence to prescribed controller medication. These additional parameters allowed a quick glimpse at the patient's asthma control. Nevertheless, the pharmacist may have benefited from looking at other information, such as the patient's Asthma Control Test score, before forming a decision about what type of intervention to perform.

The newest version of the Asthma Control Test states that a patient with a score of 19 points or less may have asthma that is not under control and recommends that the patient make an appointment to discuss the results with his/her health care professional. If a patient scores 20 points or more, asthma is considered well controlled. Alone, the Asthma Control Test may not prompt pharmacist-initiated interventions. However, combined with an evaluation of the amount of SABA used, the patient's inhaler technique, and the patient's adherence to controller medications, one can obtain a more complete picture of the patient's asthma control. Information about oral steroid usage, hospitalizations, emergency department visits, and missed days of work and/or school, or other activities in the past year because of breathing difficulties may also be beneficial. The community pharmacist should consider asking more questions to gain more insight before making a recommendation to change drug therapy.

When designing the study, we predicted that many patients could benefit from the selected interventions. Patients who refill one to two inhalers every month or sooner are not uncommon.

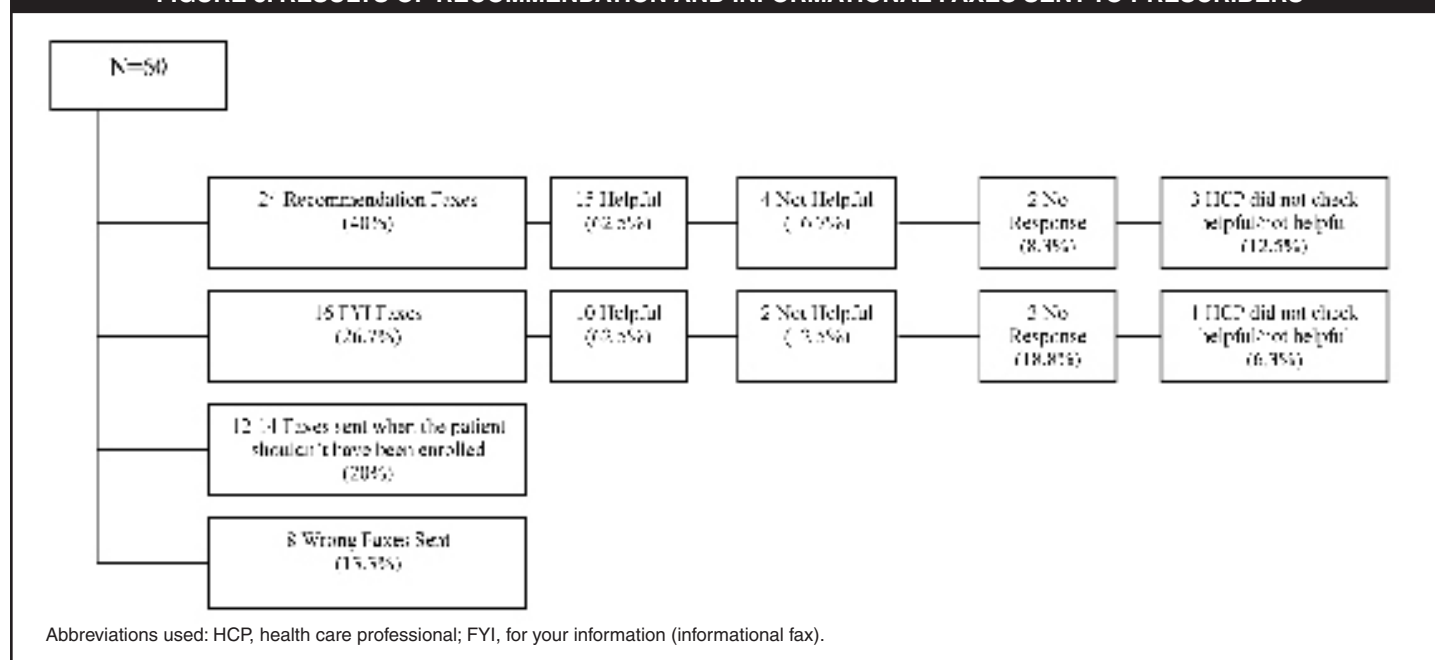
Study criteria eliminated a large number of these patients who were excessively using SABAs because of their age or a comorbid lung condition. Even so, our enrollment was not what we had anticipated. Perhaps the largest contributing factor to the lack of enrollment was that just 33 of the potential 48 pharmacies chose to participate in the study. Of those 33 pharmacies, only 16 performed at least one fax intervention.

We believe these disappointing results speak to the difficult process of changing the direction of a profession. As long as patient and provider expectations of community pharmacists remain stagnant, there really is no forthright reason to change our existing practices/behavior. However, as professionals we should constantly be searching for ways to improve our services and utility beyond dispensing. Without further motivation to change, pharmacy practice will likely continue to focus on volume and dispensing. We challenge our colleagues in the Coulee Region and throughout the nation to use opportunities such as Medicare Part D's medication therapy management services and projects of the American Pharmacists Association Foundation to help raise the expectations patients and health care professionals place on community pharmacists by implementing worthwhile pharmaceutical care into daily practice.

In today's busy practice setting, communication via telefacsimile is ideal. Considering the study's low no-response rate and the ease of communication, we recommend making pharmaceutical care interventions via fax. Not only is sending a fax convenient for the pharmacist to make the recommendation at his or her own pace, but the receiving health care professionals can view them at their convenience. One potential limitation to sending interventions via facsimile is the length of time it takes to receive a response. This study had a mean response time of eight to 12 days; a rather slow response time.

The recommendation and informational fax forms used in this study can be downloaded as a single document and used by

FIGURE 3. RESULTS OF RECOMMENDATION AND INFORMATIONAL FAXES SENT TO PRESCRIBERS





THE COMBINED ASTHMA CARE FAX AS WELL AS INSTRUCTIONS FOR USE CAN BE ACCESSED AT THE FOLLOWING WEBSITES:
WWW.CHAWISCON.SIN.ORG/ASTHMARESOURCES.HTM
WWW.PSWI.ORG

pharmacists wishing to implement this intervention.

Results showed specialty physicians found the faxed interventions to be most helpful, followed by nonspecialty physicians and then nurse practitioners. However, one important consideration that one should keep in mind is that specialty physicians and nurse practitioners were poorly represented, and the results could easily have been influenced by one individual's opinion. For the most part, the trend from all health care professionals determined that both fax interventions were helpful in making clinical decisions.

The design of the study required the pharmacist to observe and evaluate the patient's inhaler technique. However, subsequent pharmacist counseling on technique was optional. Likewise with regard to adherence, the pharmacist was advised to review the patient's prescription profile to determine adherence to prescribed controller medication(s). However, the pharmacist was not obligated to counsel on the importance of adherence to controller medication. This study showed that pharmacist-initiated directions on inhaler technique was not always performed. However, when the pharmacist observed improper technique, counseling rates were higher. With regard to adherence, counseling was slightly more frequent than instruction on inhaler technique and markedly improved when poor adherence was observed.

Even with the improvement in counseling rates for adherence, the results were less than impressive. Counseling with regard to inhaler technique and the importance of adherence to controller medications should be provided at every visit based on the patient's individual needs to reinforce how to maintain asthma control.

According to the demographic survey, 100% of patients stated that they thought their pharmacist did a good job explaining their medications. Despite this, pharmacies still have nonadherent patients. Patients may think that pharmacists are doing a good job, when in reality this may not be the case. Explaining the use of medications well does not necessarily have a direct influence on motivating a patient to be adherent. Perhaps the results of this study can be viewed as an opportunity to refine counseling goals based on the patient's individual needs.

LIMITATIONS

Perhaps the most unfortunate limitation of this study is its small sample size. We had a difficult time convincing pharmacies to participate. Furthermore, in the pharmacies that did participate, most pharmacists had a difficult time enrolling patients. The most common excuse noted by both pharmacies and prospective participants was that they were too busy to participate. Because the study involved only voluntary participation, one issue that could be raised is potential selection bias.

When making their recommendation to step up drug therapy, participating pharmacists were not required to consider that patients might be taking nonselective beta-blockers, nonsteroidal

TABLE 1. DEMOGRAPHIC CHARACTERISTICS OF PATIENTS

| | |
|--|---------------|
| No. Patients | 31 |
| Gender, no. (%) | |
| Men | 15 (48) |
| Women | 16 (52) |
| Age in years, mean (range) | 39.83 (17–58) |
| Educational level, no. (%) | |
| Some high school | 3 (10) |
| High school graduate | 12 (39) |
| More than high school | 14 (45) |
| No response | 2 (6) |
| Race/ethnicity | |
| White | 24 (78) |
| African American | 1 (3) |
| Asian | 1 (3) |
| No response | 5 (16) |
| Smoking status | |
| Smoker | 11 (35) |
| Nonsmoker | 20 (65) |
| Nonsmoker who previously smoked | 5 (25) |
| Albuterol refills per 90 days, mean (range) | 4.19 (3–11) |
| 3 inhalers, no. (%) | 13 (43) |
| 4 inhalers, no. (%) | 11 (36) |
| 5 inhalers, no. (%) | 2 (6) |
| 6 inhalers, no. (%) | 2 (6) |
| 7 inhalers, no. (%) | 2 (6) |
| 11 inhalers, no. (%) | 1 (3) |
| Patients who have had an appointment with their health care professional, no. (%) | |
| In the last 6 months | 13 (42) |
| In the last year | 20 (65) |
| Top reasons patients were not enrolled, no. (%) | |
| Met exclusion criteria | 112 (59) |
| Not interested in pharmacist involvement | 28 (14) |
| Did not have time | 13 (7) |
| Took forms and did not bring them back | 11 (6) |
| Low mental capacity | 11 (6) |
| Other | 16 (8) |
| Top exclusion criteria met, no. (%) | |
| Age greater than 60 | 61 (53) |
| Chronic obstructive pulmonary disease | 28 (24) |
| Other | 25 (23) |
| Uncontrolled patients,^a no. (%) | 31 (100) |
| Type of health care provider, no. (%) | |
| Nurse practitioner | 16 (5) |
| Nonspecialty physicians | 21 (68) |
| Specialty physicians ^b | 5 (16) |

a. Determined from Asthma Control Test.⁴

b. Pulmonologist or allergist.

TABLE 2. SURVEY OF PATIENTS' ASTHMATIC CONDITIONS

| Items | Alternatives | No. (%) |
|---|-----------------------------|----------|
| ■ In the past four weeks, how much of the time did your asthma keep you from getting as much done at work or home? | None of the time | 8 (26) |
| | A little of the time | 10 (32) |
| | Some of the time | 7 (23) |
| | Most of the time | 4 (13) |
| | All of the time | 2 (6) |
| ■ During the past four weeks, how often have you had shortness of breath? | None of the time | 12 (39) |
| | A little of the time | 12 (39) |
| | Some of the time | 6 (19) |
| | Most of the time | 1 (3) |
| | All of the time | 0 (0) |
| ■ During the past four weeks, how often did your asthma symptoms (wheezing, coughing, shortness of breath, chest tightness, or pain) wake you up at night or earlier than usual in the morning? | Not at all | 5 (16) |
| | Once or twice | 7 (23) |
| | Once a week | 4 (13) |
| | two to three nights a week | 6 (19) |
| | Four or more nights a week | 9 (29) |
| ■ During the past four weeks, how often have you used your rescue inhaler or nebulizer medication (such as albuterol)? | Not at all | 2 (6) |
| | Once a week or less | 3 (10) |
| | A few times a week | 12 (39) |
| | one or two times per day | 14 (45) |
| | three or more times per day | 0 (0) |
| ■ How would you rate your asthma control during the past four weeks? | Completely controlled | 2 (6) |
| | Well controlled | 9 (29) |
| | Somewhat controlled | 13 (43) |
| | Poorly controlled | 6 (19) |
| | Not controlled at all | 1 (3) |
| ■ Are you requesting a refill because you are close to being out of medication? | Yes | 28 (91) |
| | No | 2 (6) |
| | Not Sure | 1 (3) |
| ■ Are you requesting a refill because you have lost your medication? | Yes | 1 (3) |
| | No | 30 (97) |
| ■ Are you requesting a refill because you want to have a back-up inhaler? | Yes | 7 (23) |
| | No | 23 (74) |
| | Not sure | 1 (3) |
| ■ Do you get any of your asthma medications filled at more than one pharmacy? | Yes | 2 (6) |
| | No | 29 (94) |
| ■ At your last health care visit, did your health care professional review your inhaler technique? | Yes | 12 (39) |
| | No | 18 (58) |
| | Not sure | 1 (3) |
| ■ Do you think you have a good understanding of what your medications do? | Yes | 30 (97) |
| | Not Sure | 1 (3) |
| ■ Have you been to the emergency department in the past year because of breathing difficulties? | Yes | 8 (26) |
| | No | 22 (71) |
| | Not sure | 1 (3) |
| ■ Have you been hospitalized in the past year because of breathing difficulties? | Yes | 3 (10) |
| | No | 28 (90) |
| ■ Have you missed days of work or school in the past year because of breathing difficulties? | Yes | 13 (42) |
| | No | 18 (58) |
| ■ Have you taken prednisone or other oral steroids in the past year because of breathing difficulties? | Yes | 17 (55) |
| | No | 12 (39) |
| | Not sure | 2 (6) |
| ■ Do you feel like you know how to use your inhaler(s) properly? | Yes | 30 (97) |
| | Not sure | 1 (3) |
| ■ Do you feel like your pharmacist has done a good job explaining your asthma medications? | Yes | 31 (100) |

antiinflammatory drugs, or other medications that could potentially nullify the effect of the SABA. We encourage anyone wanting to model a pharmaceutical care intervention after this study to consider the impact of concomitant drug therapy.

Also, this study did not monitor nebulizer use of SABAs. Generally, nebulizers are used for the young or for the elderly who struggle with coordination, and our study population was restricted to ages 12 to 60. Furthermore, recent data suggest that metered-dose inhalers may be as effective, if not more effective, as nebulizer machines.^{5,6}

Finally, this study had a very lenient definition of appropriate adherence. Anyone who had refilled at least two 30-day supplies of their controller medications in the past 90 days was categorized as adherent. We recognize that this definition of appropriate adherence is not very specific. The intention was for the pharmacist making the intervention to use his or her professional discretion in determining whether the patient was adherent. Every professional has an opinion of appropriate adherence and that could produce some variability among decisions about which intervention fax to send.

CONCLUSION

Faxed recommendation and informational forms were viewed overall as helpful in making clinical decisions by a group of health professionals. The two forms were equally helpful to the physicians and nurse practitioners who received them, and our results suggest that community pharmacist-initiated pharmaceutical care may be helpful to these colleagues in providing care to patients with asthma. ●



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Update From the Authors

Since the asthma care fax program was created, new developments have surfaced in the asthma care realm. Namely, the National Institute of Health: Heart Lung and Blood Institute has reconvened an expert panel comprised of asthma specialists (both pulmonologists and allergists) to evaluate the existing asthma management guidelines. Historically, the guidelines were based on what was believed to be "best practice" rather than evidence from the medical literature. The new guidelines (anticipated to be released in the next few months) rely more heavily on evidence-based medicine in making recommendations. One anticipated change in the new guidelines is the importance of "control" in the management of asthma. Patients who over-utilize short-acting beta-agonist medications are generally considered poorly controlled. The Asthma Care fax program may be one way to help identify patients with inadequately controlled asthma. The final guidelines will be published in the *Journal of Allergy and Clinical Immunology* in the spring or early summer of 2007. After the final guidelines are published, the Asthma Care fax will be updated to reflect any changes.

I have received feedback from several health care providers throughout Wisconsin stating they sincerely appreciate it when pharmacists take the time to inform them that their patient may be excessively using a short-acting beta-agonist. These providers wished more pharmacists would utilize the Asthma Care fax.

The Asthma Care fax is available online at www.pswi.org as a free download. Again, it will be updated once the new asthma treatment guidelines are released. Please take some time to download the Asthma Care fax, individualize it to your practice site, and incorporate it into your daily practice.

— Erika Horstmann PharmD, RPH