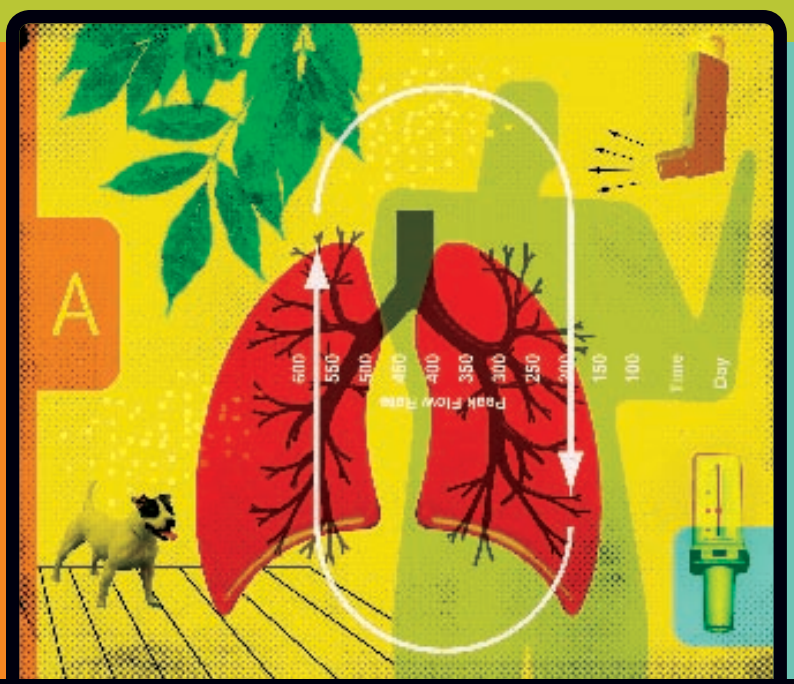
A clear goal, staff buy-in and simple tools – such as an asthma flow sheet – can help your practice follow asthma guidelines more consistently.



Tools *and* Strategies *for* Improving Asthma Management

Ronald Adler, MD, FAAFP, and Jeanne McBride, RN, BSN, MM

How reliable is your practice at implementing current guidelines for diagnosing and managing asthma? Several years ago, we suspected that our practice, a family medicine training site, was not performing well in this area. After a rapid chart audit confirmed this, we decided to launch a redesign effort. Our aim was to improve the quality of care provided to patients with asthma over six months through the reliable implementation of evidence-based guidelines.

This article outlines the steps we took and the decision support tools we created to help us achieve our goal.

Assessing compliance with asthma guidelines

Our first steps were developing a clear understanding of the consensus guidelines for asthma,[1] distilling them to the salient points for a presentation to our medical staff and determining the ways in which our current practice deviated from these guidelines.

To accomplish the latter, our leadership team designed a simple chart audit tool, and our quality improvement project manager and a medical student we recruited for the project audited 100 charts. Though it was time consuming, this process revealed a number of important findings that informed our interventions. We learned that many of our asthma patients were frequently seen by providers other than their primary care provider due to the episodic nature of the urgent visits that are common in asthma, and the part-time status of most of our providers. Poor continuity contributed to fragmented care including inconsistent follow-up and poor adherence to recommended guidelines in terms of severity ratings, use of controller medications, annual flu shots and self-management tools such as asthma action plans and peak flow logs.

STUART BRADFORD

ASTHMA MANAGEMENT FLOW SHEET

Patient name: _____

Environmental triggers: _____

Date of last PPSV shot: _____ Date of last flu shot: _____

Date of visit				
Asthma severity mild intermittent = 1 mild persistent = 2 moderate persistent = 3 severe persistent = 4	# _____	# _____	# _____	# _____
Visit type (circle one)	Acute / Maintenance	Acute / Maintenance	Acute / Maintenance	Acute / Maintenance
ED visits since last appointment?	Y / N # _____	Y / N # _____	Y / N # _____	Y / N # _____
Hospitalizations since last appointment?	Y / N # _____	Y / N # _____	Y / N # _____	Y / N # _____
Peak flow	Personal best: _____ Today: _____	Personal best: _____ Today: _____	Personal best: _____ Today: _____	Personal best: _____ Today: _____
Medication changes				
Teaching				
General asthma info	☐	☐	☐	☐
Inhaler use	☐	☐	☐	☐
Environment/triggers	☐	☐	☐	☐
Peak flow use	☐	☐	☐	☐
Spacer use	☐	☐	☐	☐
Reviewed asthma action plan	☐	☐	☐	☐
Other	☐	☐	☐	☐
Planned follow-up (months)				
Comments				
Nurse signature				
Provider signature				

continued ➤

Family Practice Management®

ASTHMA SEVERITY

Severity	Daytime symptoms	Nighttime symptoms	Lung function Peak expiratory flow rate (PEF) or forced expiratory volume (FEV1) (PEF is % of personal best; FEV1 is % predicted)	Long-term control - patients older than 5 years (See below for drugs and dosages; preferred treatment in **bold**.)	Long-term control - children 5 years or younger (See below for drugs and dosages; preferred treatment in **bold**.)
Mild intermittent	≤ 2 days/week Exacerbations are brief with varying intensity.	≤ 2 nights/ month	≥ 80% predicted PEF variability < 20%	**No daily controller medication indicated. Monitor frequency of use of relief medications.***	**No daily controller medication indicated. Monitor frequency of use of relief medications.***
Mild persistent	> 2 times/week but < 1 time/day Exacerbations may affect activity.	> 2 nights/ month	≥ 80% predicted PEF variability 20%-30%	**Low-dose inhaled corticosteroids** Alternative treatment: cromolyn, leukotriene receptor antagonist (LTRA), nedocromil OR sustained release theophylline to serum concentration 5-15 mcg/mL	**Low-dose inhaled corticosteroids** Alternative treatment: cromolyn OR LTRA
Moderate persistent	Daily use of inhaled short-acting beta-agonist. Exacerbations occur ≥ 2 times/ week and affect activity.	> 1 night/week	61%-80% predicted PEF variability > 30%	**Low- to medium-dose inhaled corticosteroids AND long-acting beta-agonist (LABA)** Alternative treatment: Increase inhaled steroids within medium-dose range OR low- to medium-dose inhaled corticosteroids and either LTRA or theophylline	**Low-dose inhaled corticosteroids AND LABA OR medium-dose inhaled corticosteroids** Alternative treatment: Low-dose inhaled corticosteroids and either LTRA or theophylline
Severe persistent	Continual Exacerbations are frequent and limit physical activity.	Frequent	≤ 60% predicted PEF variability > 30%	**High-dose inhaled corticosteroids AND LABA** AND, if needed, corticosteroid tablets or syrup 2 mg/kg/day; generally do not exceed 60 mg/day	**High-dose inhaled corticosteroids AND LABA** AND, if needed, corticosteroid tablets or syrup 2 mg/kg/day; generally do not exceed 60 mg/day

LONG-TERM THERAPY

	Low daily dose		Medium daily dose		High daily dose	
Drug	**Adult**	**Child**	**Adult**	**Child**	**Adult**	**Child**
Fluticasone MDI: 44, 110 or 220 mcg/puff	88-264 mcg	88-176 mcg	264-660 mcg	176-440 mcg	> 660 mcg	> 440 mcg
Budesonide DPI: 200 mcg/inhalation	200-600 mcg	200-400 mcg	600-1200 mcg	400-800 mcg	> 1200 mcg	> 800 mcg
Fluticasone/ salmeterol DPI: 100, 250, 500 mcg/50 mcg	100-300 mcg (fluticasone)	100-200 mcg (fluticasone)	300-600 mcg (fluticasone)	200-400 mcg (fluticasone)	> 600 mcg (fluticasone)	> 400 mcg (fluticasone)

Relative strengths: fluticasone > budesonide = beclomethasone > flunisolide = triamcinolone

Systemic bioavailability (contributes to side effects): 20% - triamcinolone, flunisolide and beclomethasone; 11% - budesonide; and 1% - fluticasone

Quick relief (patients older than 5 years): short-acting bronchodilator, 2-4 puffs as needed for symptoms; up to 3 treatments at a 20-minute interval, or a single nebulizer treatment as needed.

Quick relief (children 5 years or younger): short-acting inhaled beta-agonist by nebulizer or face mask and spacer/holding chamber; alternative treatment: oral beta-agonist.

* Use of short-acting beta-agonists > 2 times a week in intermittent asthma (or daily or increasing use in persistent asthma) may indicate a need for long-term therapy.

It was also difficult to quickly find previous asthma visit notes and the current treatment plan in the chart. Often an interim treatment plan would be initiated, but the recommended follow-up visit would not occur. Patient education was limited as many visits were short, urgent appointments for management of acute exacerbations. The result was often poorly controlled asthma with little patient self-management.

It became clear that if we wanted to increase our reliability at implementing the guidelines, we would need to devise a system that made it easy for the providers to do the right things. This would require a team effort with substantial reliance on the nursing staff and chart tools designed to stimulate the capture of essential information.

Implementing interventions

Based on our review of the literature and the guidelines plus the findings from our chart audit, we sought to do the following:

- Improve the frequency with which providers determine and record asthma severity,
- Increase the use of spirometry for the diagnosis of asthma,
- Ensure that peak flow is measured at every visit,
- Ensure that every patient with asthma is offered a flu shot each winter,
- Inform and activate patients to be more involved in their asthma management through action plans and home peak-flow monitoring.

To accomplish these objectives, we implemented a variety of interventions:

Patient identification. First, we developed an asthma registry. This was simply a Microsoft Excel computer file with a list of all our patients with asthma, which we created by mining our billing data for asthma-related ICD-9 codes. We then flagged these patients' charts by placing a blue sticker on each one. This facilitated identification of patients with asthma even when they were coming in for other reasons and made it easier to audit these charts at the end of the day.

Patient self-assessment. When our nursing staff identified patients with asthma, they asked these patients to complete a self-assessment form (shown on page 20; also available in Spanish at http://www.aafp.org/fpm/2010/0100/p16). This form serves multiple important purposes: First, it helps ensure that we take a more proactive role in the management of asthma by addressing it even if the patient is presenting for issues unrelated to asthma. Second, it is in keeping with the spirit of the chronic care model (http://www.improvingchroniccare.org) in that it challenges patients to be more actively involved in their own care. Third, it helps our practice identify opportunities for intervention, such as filling prescriptions, providing a peak flow meter and encouraging its use, or providing patient education.

Chart reminders. To keep our staff on track with the guideline-driven program, we developed an asthma-management flow sheet (shown on page 17). At each visit, the nursing staff member who rooms the patient is responsible for initiating the flow sheet. She completes as much of it as possible before clipping it to the front of the chart for the provider to continue at the visit. (We print this form on blue paper, so it stands out and conveys at a glance that "this patient has asthma.") Note that the staff are challenged at the top of the form to record the asthma severity rating, which informs the rest of the patient's care. The form also includes reminders about peak flow measurement, flu vaccination and pneumococcal polysaccharide vaccine (PPSV).[2] The form is designed to be used for up to four visits so the physician can identify trends and can tell at a glance what teaching needs have already been addressed and which

Having a method for quickly identifying patients who have asthma can help a practice improve care for this population.

A patient self-assessment form makes care more proactive and collaborative.

An asthma flow sheet helps remind the clinical staff of key elements of the asthma guidelines.

About the Authors

Dr. Adler is assistant professor of family medicine and community health and director for primary care practice improvement at the University of Massachusetts Medical School in Worcester, Mass. Jeanne McBride is quality improvement project manager for the Center for the Advancement of Primary Care, University of Massachusetts Medical School, UMass Memorial Health Care. Author disclosure: nothing to disclose. The authors would like to acknowledge that this work could not have been accomplished without the extraordinary contributions of Andrew Gara, BA, and Barbara Foley, RN, MS.

Article Web Address: http://www.aafp.org/fpm/2010/0100/p16

should be considered. On the back of the form, we print the diagnostic criteria for each severity rating and a summary of the available medications for each class with useful dosage details (see page 18).

Committed nurses. The proper use of the flow sheet relies on our nursing staff being much more engaged in the care of our patients with asthma, so we decided to give them additional training. We identified a series of weekend continuing education courses and offered to pay the tuition. All of our nursing staff embraced this opportunity, using their personal time to attend the courses. Not only did this provide the nurses with much-needed continuing education units, but it also proved to be a positive team-building experience and a key step in getting our nurses committed to this work and highly motivated to drive our work flow changes and sustain this over time.

An improved diagnostic tool. Spirometry is a powerful diagnostic tool; however, for

PATIENT SELF-ASSESSMENT FORM – ASTHMA

Patient name: _____ Date: _____

Since your last visit:

1. Has your asthma been any worse? No _____ Yes _____
2. Have there been any changes in your home, work or school environment (such as a new pet or someone smoking)? No _____ Yes _____
3. Have you had any times when your symptoms were worse than usual? No _____ Yes _____
4. Has your asthma caused you to miss work or school or reduce or change your activities? No _____ Yes _____
5. Have you had any emergency room visits or hospital stays for asthma? No _____ Yes _____
6. Have you missed any regular doses of your medicines for any reason? No _____ Yes _____
7. Have your medications caused you any problems (shakiness, nervousness, bad taste, sore throat, upset stomach)? No _____ Yes _____
8. Please list the medications you currently take for asthma and how often you take each (more than once per day, once per day or less than once per day):

   _____
9. Do you need refills for any medication today? No _____ Yes _____

In the past two weeks:

10. Have you had a cough, wheezing, shortness of breath or chest tightness during:
    the day? No _____ Yes _____
    the night? No _____ Yes _____
    exercise or play? No _____ Yes _____
11. Do you have a peak flow meter? No _____ Yes _____
    How often do you use it? _____ days per week
    What is your personal best? # _____ or Don't know _____
12. How many days have you had to use your rescue inhaler? _____ days
13. Have you been satisfied with the way your asthma has been? No _____ Yes _____
14. What are some concerns or questions you would like to talk about during this visit?

    _____

    _____

Provider's signature: _____

a variety of reasons, our practice had never offered the service in-house. After researching the various aspects of office spirometry,[3] we learned that purchasing a hand-held device would allow us to diagnose asthma more accurately, and the return-on-investment analysis proved promising.

Internal audits. During our project, we tracked documentation of the asthma severity rating, personal best peak flow, visit peak flow results and use of controller medications. Because this audit was conducted by our nurse manager daily, she was able to provide helpful feedback to her staff in a timely way that resulted in rapid achievement of 100 percent performance on these measures. The physicians and NPs lagged a little at first, but the momentum coming from the nursing staff and other providers inspired relatively rapid change. Because we were doing a better job of identifying patients with asthma, flu vaccination rates in this population also increased.

Advice for other practice settings

Our program for improved asthma care was successfully implemented at a large residency training site staffed by many part-time physicians using paper charts. It is expected that even small practices would find this simple but systematic practice redesign intervention easy to accomplish. Likewise, this intervention could be adapted to a practice that uses an electronic health record (EHR) by creating an electronic "flag" that indicates patients who have asthma and by importing the asthma management flow sheet into the EHR.

We recognize that, given the pace of and demands on family medicine practices, practice redesign represents a formidable challenge. It takes substantial effort to overcome the inertia associated with the status quo. Many physicians will feel intimidated by this process, especially when a daunting goal is articulated. Those in small practices may feel that they have limited resources to devote to such efforts, while those in larger practices are more likely to face challenges to continuity and a lack of cohesion among many (often part-time) providers.

Regardless of practice setting, an iterative process of sequential small changes informed by plan-do-study-act cycles can produce substantial change over time. Simply asking the question "What can we do by next Tuesday?" will likely result in measurable improvement.

For example, regular measurement and documentation of peak flow could be instituted first as a trial for the patients of one physician on one day. A brief discussion at the end of the day among the physician and staff would likely reveal the extent to which this was helpful and any problems encountered. These results could be used to plan the next trial, as the process is improved and refined. Only after it is working well for one physician would the process be spread to others in the practice. This helps avoid the premature implementation of a flawed process and fosters staff buy-in and a strong sense of team.

Keys to success

We believe our asthma improvement program was successful for the following reasons:

- The scope of the program was clearly defined: implementation of evidence-based guidelines for a common, chronic condition.
- Physician and nurse leaders were committed to the program, and staff buy-in was achieved through peer education and commitment of a small resource (paying for nurses to attend educational workshops).
- We redesigned our systems to make it easy to do the right thing; chart "flags" and "tools" helped drive the changes.
- We used data to demonstrate the need for change. Evidence of our initial lack of compliance with guidelines was a potent motivator, and ongoing data reports were effective for enhancing compliance and performance.
- We understood the importance of vision, planning and commitment.

Others seeking to replicate our program should consider the above factors. By adopting this approach, practices will also discover that they have adopted many of the features of the patient-centered medical home. FPM

Send comments to **fpmedit@aafp.org.**

1. *Guidelines for the Diagnosis and Management of Asthma: National Asthma Education and Prevention Program Expert Panel Report 3*. Bethesda, Md: National Heart, Lung and Blood Institute; October 2007; http://www.nhlbi.nih.gov/guidelines/asthma/asthsumm.htm.

2. Advisory Committee on Immunization Practices. Recommended adult immunization schedule: United States 2009. *Ann Intern Med*. 2009;150:40-44.

3. Barreiro TJ, Perillo I. An approach to interpreting spirometry. *Am Fam Phys*. 2004;69:1107-1114.

Empowering nurses and engaging them in the process is critical to success.

Internal chart audits are helpful for demonstrating the need for change and, later, the degree of improvement achieved.

Although clinical quality improvement is a challenge, it is possible through sequential small changes.