Pulmonary Practice Pearls for Primary Care Physicians
9-part eNewsletter series

Focus on COPD (Issue 7)

Primary care physicians routinely see patients with chronic respiratory diseases, such as asthma and chronic obstructive pulmonary disease (COPD). Although treatment guidelines are available, we still need practical information that translates guidelines and other evidence so that we can better diagnose and manage these diseases. Each issue in the *Pulmonary Practice Pearls for Primary Care Physicians* eNewsletter series focuses on a key topic in the management of COPD or asthma within the context of current national guidelines and clinical practice. Topics are brought to life through the presentation of hypothetical clinical cases, and an emphasis is placed on applying key learnings to clinical practice. Practice tools and links to additional information are featured in each issue.

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**Action Plans as Part of Self-Management for Asthma and COPD Patients**

**Introduction**

Periodic clinical assessment and ongoing monitoring are used to determine if the goals of therapy for asthma and chronic obstructive pulmonary disease (COPD) are being achieved.\(^1\)\(^2\) Patient monitoring of respiratory symptoms can be an important component of disease management that allows for early recognition of changes in disease activity.\(^1\)\(^2\) For individuals with moderate or severe persistent asthma, a history of severe exacerbations, who poorly perceive airflow obstruction, or who have worsening asthma, a daily peak expiratory flow (PEF) should be considered.\(^1\)

Written action plans (WAPs), also called Asthma Action Plans (AAPs) or COPD Action Plans (CAPs), provide patients with guidance on adjusting their treatment in response to changes in respiratory symptoms or PEF. WAPs are recommended in the 2007 US National Asthma Education and Prevention Program (NAEPP) guidelines for all asthma patients, particularly for those who have moderate or severe persistent asthma, a history of severe exacerbations, or poorly controlled asthma.\(^1\) While an evidence-based analysis published in 2002 concluded that WAPs for asthma did not improve outcomes,\(^2\) a later systematic review found that WAPs incorporating personal best PEF consistently improved health outcomes.\(^4\) Other studies have shown further benefits of asthma WAPs.\(^5\)\(^6\)

WAPs for COPD generally do not focus on daily management, but are designed to help patients identify the onset of an exacerbation and expedite the initiation of treatment.\(^2\)\(^9\) While there is conflicting evidence for the effectiveness of WAPs for COPD in isolation, their ability to improve health outcomes as part of a multifaceted self-management program explains their increasing acceptance. WAPs for COPD can help patients and their families recognize early symptoms of an exacerbation which enables initiation of appropriate treatments, thereby decreasing the need for urgent visits to health care providers.\(^2\)\(^9\)

**Written Action Plans for Adults with Asthma**

Key components of asthma WAPs are: (1) instructions for daily management and (2) recognition and handling of worsening asthma, including self-adjustment of medications for acute symptoms or PEF worsening (Table 1).\(^1\) According to the NAEPP, WAPs can be based on symptoms and/or PEF measurements because they are equally effective when instructions are followed correctly.\(^1\) The choice should be a collaborative decision between the patient and physician that considers asthma severity, availability of peak flow meters, the patient's ability to perceive airflow obstruction and/or produce an accurate PEF, as well as patient preferences.\(^1\) Few patients choose PEF monitoring, which is intended to supplement, not replace, symptom recognition.\(^1\) In a survey study of barriers to PEF monitoring, 31% of the 139 respondents reported not having a monitor, while a further 30% thought that their asthma was not bad enough to require PEF monitoring.\(^10\) Other barriers were, "doesn't help me" (13%), "not worth the effort" (12%), "takes too much time" (11%), "never told about peak flow" (7%), "lost my meter" (3%), and "broke my meter" (1%).\(^10\) The results support the assertion that physicians choosing to use PEF will need to motivate and educate patients to incorporate PEF into their asthma care. Education should include proper instructions for use of the peak flow meter and an understanding of how the results can help patients and their doctors monitor asthma.\(^1\) When using a PEF-guided WAP, a personal best PEF can be established by recording PEFs over 2 weeks when the patient is having minimal or no asthma symptoms. Use of peak flow meters can provide information about possible triggers that worsen symptoms, and can assist patients in treatment
decisions and when to seek emergency care. When recommending the use of PEF, it is important to observe the patient’s testing capability. Use of symptom monitoring also requires education in the form of helping patients to understand that symptoms and limitations of exercise and activity are not normal consequences of asthma, and should be reported and treated.

**Sample Written Action Plans for Asthma**

Sample WAPs for asthma are available through organizations, such as the American Lung Association and the National Heart, Lung, and Blood Institute (Figure 1). Asthma WAPs commonly feature a green, yellow, and red color scheme to indicate the level of current symptoms, as well as an illustration of each symptom burden level.

As with all asthma educational material, WAPs should be individualized based on the patient’s knowledge about the disease, reading ability, and cultural variables. When selecting a WAP, consider the reading level and visual appeal. A recent study of 30 WAPs, representing 27 state Department of Health-developed plans and 3 national plans, showed that only 30% were written at a 6th grade level or lower, which is the recommendation for understanding by the general public. If possible, WAPs should be discussed in the patient’s native language. Pedipress Publishers offer asthma WAPs in Spanish, if that is the preferred language of the patient. In addition, the word “action” may require further explanation as it relates to a medical treatment plan because mismatches in language between patients and clinicians have been shown to affect adherence and appropriate use of healthcare services. The “action” recommended in the WAP may vary between patients, and can include immediate use of a short acting bronchodilator, monitoring for improvement, use of oral steroids, immediate transport to an emergency medical site, or even calling 911.

**Effectiveness of Adult Asthma Action Plans**

In 2002, a systematic review found conflicting evidence for the benefit of WAPs on inpatient and outpatient utilization, lung function, symptoms, rescue medication or oral steroid use, and quality of life. However, a systematic review published in 2004 found that individualized WAPs incorporating personal best PEF that were based on 2 to 4 action points and recommended both inhaled and oral corticosteroids for the treatment of exacerbations consistently improved asthma health outcomes.

A further review of 36 randomized, controlled trials including more than 6000 adults with asthma found that optimal self-management education (defined as including WAPs, self-monitoring by either PEF or symptoms, and regular medical reviews) reduced hospitalizations, emergency department (ED) visits, unscheduled doctor visits for asthma, work absences, and nocturnal asthma, and was associated with improved quality of life. No difference in outcomes was observed when patients followed a WAP to self-adjust their medication compared with when clinicians adjusted treatment. Findings from a 2012 study of 808 women with asthma showed that WAP use was significantly associated with positive self-management, including action to take asthma medication as prescribed and initiate discussions about asthma with physicians. It also correlated positively with patient satisfaction with asthma care.

**Children and Adolescents**

Use of asthma WAPs for children and adolescents needs to consider whether the plan will be centered on the child or the parent and the level of agreement between parents and children with symptom perception and quality of life. The asthma WAP should be shared with and understood by all caregivers, including childcare settings and schools. Open communication at each follow-up visit is important to assess and revise treatment goals, confirm that patients and families know what to do if symptoms worsen, and make any necessary adjustments.

A Cochrane systematic review showed that children preferred symptom-based WAPs over PEF-based WAPs, and that the addition of PEF monitoring to a symptom-based guided self-management plan in children aged 7 to 14 years did not result in improved self-management decisions. Moreover, use of symptom-based WAPs was associated with a lower risk of exacerbations which required an acute care visit.

Special considerations for school and childcare settings include:

- Parents should be encouraged to take a signed copy of the WAP to the child's school or childcare setting.
- Some schools and camps have specific action plans that require annual completion, whereas others may accept a copy of the plan used by the health care provider. The Asthma and Allergy Foundation of America provides a school-based asthma WAP.
- School-based plans have specific information including the parent or guardian's contact information,
whether or not the child is able to self-administer and carry their own rescue medication, and when emergency medical care should be contacted.

- In some schools, the form for self-administration of medication may be separate from the WAP.
- All school action plans should include specific medication orders, and an example of the importance of the wording of these orders is highlighted in Table 2.

### Written Action Plans for COPD

COPD exacerbations accelerate disease progression, reduce quality of life, and are a leading cause of disability and costs.\(^{14,15}\) Thus, the prevention and reduction of exacerbations is a goal of COPD management.\(^2\) An important aspect of achieving this goal is the patient's ability to recognize early warning signs of an exacerbation and to have the ability to act accordingly.\(^7,8\) In contrast to asthma WAPs, plans for COPD generally do not focus on daily management. COPD WAPs are designed to help patients identify deterioration of their symptoms and provide guidelines for early treatment initiation.\(^7,8\) Early intervention may prevent a COPD exacerbation from escalating to a hospitalization.

#### Case

Naomi is a 58-year-old patient with COPD that you diagnosed more than 5 years ago. She continues to smoke, although she has cut back to only 5 cigarettes each day. She works as a school secretary, and has been in this position for the past 24 years. This is a follow-up visit for what Naomi insists is bronchitis.

Naomi is obese (BMI 33). She has heart disease with a previous acute myocardial infarction, and recently she was diagnosed with diabetes. She is taking multiple medications for COPD, cardiovascular disease, hypertension, and diabetes. While she works hard to deal with all of the medications on a daily basis, she says she has the most trouble with her diet, her fight to quit smoking, and now this second episode of "bad" bronchitis.

Note: This is a hypothetical case description for teaching purposes.

The COPD WAP should be individualized based on the patient's specific experiences with acute exacerbations, including information on symptoms, triggers, and relieving factors.\(^{16}\) After interviewing patients and physicians, Costi et al\(^ {16}\) provided a set of recommendations for components of COPD WAPs (Table 3).\(^ {17}\)

### Sample Written Action Plans for COPD

The American Lung Association (Figure 2)\(^ {18}\) and the Canadian Thoracic Society\(^ {19}\) have prepared sample COPD WAPs available on their websites.

#### Case (continued)

Today, Naomi wants to talk about this "bronchitis." Naomi's bronchitis has improved since you began the oral corticosteroids 5 days ago. Due to a change in Naomi's sputum to a greenish and thicker consistency, you also decided to begin antibiotics. But Naomi is still coughing and feels restricted in her activities due to dyspnea. She has not returned to work. Your assessment today is that Naomi is improving, but will probably not be ready to go back to work (desk job) for another 5 days or so.

You consider this second episode of bronchitis as the second COPD exacerbation this year, and decide to add an inhaled corticosteroid to Naomi's 2 long-acting bronchodilators (tiotropium and salmeterol). You also want to seize the opportunity to talk about this "bronchitis."

You use the COPD WAP to focus your discussion. The action plan includes several sections that can facilitate the discussion and help Naomi understand that she has more than just bronchitis. These sections highlight common exacerbation symptoms and appropriate actions for different levels of symptoms, and provide specific instructions about calling her physician early to manage symptoms.

Completing a COPD WAP facilitates education and provides standardized instructions, and can be updated as needed. Naomi likes having this written down. She leaves with her plan, feeling like she knows more about her COPD and how to help manage the bronchitis or exacerbations that are likely to come again.

Note: This is a hypothetical case description for teaching purposes.
Effectiveness of Actions Plans for COPD

Studies examining the effectiveness of COPD WAPs have provided conflicting results.\textsuperscript{7-9,20-23} A Cochrane meta-analysis of 5 studies that included 574 participants with moderate or severe COPD evaluated the use of a standalone WAP, without extensive self-management education or respiratory nursing outreach.\textsuperscript{9} Although the implementation of a WAP leads to increased use of oral corticosteroids and antibiotics for exacerbations, these interventions did not result in reduced health care utilization or improvement in patient well-being.\textsuperscript{9} These findings suggest that WAPs used in isolation are of limited benefit.

When WAPs are included as a component of a multifaceted self-management program or coupled with case manager support, various improvements in health care outcomes have been demonstrated in patients with COPD.\textsuperscript{21} The combination of in-home weekly teaching and a customized WAP for acute exacerbations resulted in significantly decreased hospital admissions for exacerbations, emergency department visits, and unscheduled physician visits.\textsuperscript{21} In another study, an individualized WAP and ongoing interaction with a case manager reduced symptom intensity and recovery time following an exacerbation (Figure 3).\textsuperscript{7} The authors concluded that WAPs helped the patients distinguish periods of symptom deterioration and supported adequate action measures to prevent exacerbations.\textsuperscript{7}

Of some concern, a 2012 study of a comprehensive care management program for Veterans Affairs patients, which included education, case manager support, individualized WAPs, and prescriptions for oral antibiotics and oral prednisone, was halted because of increased mortality in the intervention group.\textsuperscript{24} Patients in the intervention group did not initiate their action plan for worsening symptoms any sooner than those in the control group.\textsuperscript{24} The investigators were unable to explain the reason for their findings even after conducting post hoc analyses of baseline data and examining death records.\textsuperscript{24} Clinical review of the study suggests that the WAP did not cause the increased mortality, but unfortunately did not prevent it either. Further analysis of the study data may shed greater light on these unexpected results.

Further research into the effectiveness and safety of COPD WAPs is warranted; WAPs that are not linked to using home corticosteroids, but instead require patients to call their physicians for concerning symptoms may be preferred. In a study by Roberts et al.,\textsuperscript{25} a 24-hour, nurse-led hotline was judged by the authors to be safe and was associated with a reduced number of acute exacerbations resulting in hospitalization. Primary care physicians also should use their judgment and potentially recommend home prednisone and immediate calls to a clinic or ED for patients who have deteriorated rapidly in the past.

Implementing Action Plans

An Asthma Guideline Implementation Steps & Tools website has been developed by the Asthma Initiative of Michigan with funding from the National Asthma Control Initiative.\textsuperscript{26} The intention of the initiative is to make it easier for health care practitioners to use the National Institutes of Health Heart, Lung, and Blood Institute asthma guidelines in their everyday care of patients with asthma. The toolkit includes an implementation guide, along with a range of materials that can be adapted locally.\textsuperscript{26} A similar website for COPD, based on the work of Bourbeau et al.,\textsuperscript{21} contains a wealth of information and supportive materials relating to the implementation of patient self-management programs.\textsuperscript{27}

Conclusions

Self-management WAPs develop a partnership between patients and their health care professional by training patients to manage their day-to-day disease activity.\textsuperscript{1,28} Guidelines for asthma recognize the importance of WAPs as a part of a comprehensive management plan for all patients with asthma, especially for those who have moderate or severe persistent asthma, a history of severe exacerbations, or poorly controlled asthma.\textsuperscript{1} Similarly, WAPs that help patients recognize the early symptoms of COPD exacerbations should be used as part of a larger self-management program, and not in isolation.\textsuperscript{9,28} Whether for COPD or asthma, plans should be selected with consideration of the patient's age, language, literacy, and type of use (eg, school-based asthma plan, individualized COPD WAP), and should be reviewed and updated routinely.

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References


Table 1. Two Important Elements of Written Action Plans for Asthma

1. Daily management
   - What medicine to take daily, including the specific names of the medications
   - What actions to take to control environmental factors that worsen the patient's asthma

2. How to recognize and handle worsening asthma
   - What signs, symptoms, and PEF measurements (if peak flow monitoring is used) indicate worsening asthma
   - What medications to take in response to these signs
   - What symptoms and PEF measurements indicate the need for urgent medical attention
   - Emergency telephone numbers for the physician, ED, and person or service to transport the patient rapidly for medical care

http://newsletter.qhc.com/JFP/JFP_COPDissue7v4.1.html
Abbreviations: ED, emergency department; PEF, peak expiratory flow.

Table 2. Specific Medication Orders in School Action Plans—the Importance of Specific Wording

<table>
<thead>
<tr>
<th>Preferred</th>
<th>As opposed to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Give 2 puffs of albuterol for symptoms in the yellow zone. May repeat 2 puffs at 15 minute intervals. If symptoms do not improve after 4 puffs, proceed to red zone.</td>
<td>2 puffs of inhaler prn for symptoms.</td>
</tr>
</tbody>
</table>

The preferred wording specifies a decision or endpoint. As with nurses in other health care settings, school nurses need specific orders.

Table 3. Recommendations of Health Care Professionals and Patients Regarding a COPD-specific Action Plan

The COPD Action Plan:
- Is targeted to daily management of COPD and self-management of an acute exacerbation
- Includes acute exacerbation defined by increased dyspnea, sputum production, and sputum purulence, but also considers patient-specific symptoms, such as increased fatigue, mood disturbances, chest tightness, and difficulty sleeping
- Includes strategies to avoid exposure to patient-specific triggers, such as environmental and infective agents
- Includes a range of management options, such as an individualized medication regimen, energy conservation and relaxation techniques, breathing exercise, and methods to relieve dyspnea
- Includes strategies to address mood disturbances
- Is written in a clear, simple, and concise format
- Is no longer than 1-2 pages and written in a large font
- Is regularly reviewed to ensure its use in daily life

Abbreviation: COPD, chronic obstructive pulmonary disease.

Figures

Figure 1. Asthma Action Plan

[Diagram of Asthma Action Plan]
Figure 2. COPD Action Plan

**MY COPD ACTION PLAN**

It is recommended that patients and physicians/healthcare providers complete this action plan together. This plan should be discussed at each physician visit and updated as needed.

The green, yellow and red zones show groups of symptoms of COPD. The list of symptoms is not comprehensive, and you may experience other symptoms. In the "Actions" column, your healthcare provider will recommend actions for you to take based on your symptoms by checking the appropriate boxes. Your healthcare provider may write down other actions in addition to those listed here.

**Green Zone: I am doing well today**

- Usual activity and exercise level
- Usual amounts of cough and phlegm/mucus
- Sleep well at night
- Appetite is good

**Actions**

- Take daily medicines
- Use oxygen as prescribed
- Continue regular exercise/diet plan
- At all times avoid cigarette smoke, inhaled irritants*

**Yellow Zone: I am having a bad day or a COPD flare**

- More breathless than usual
- I have less energy for my daily activities
- Increased or thicker phlegm/mucus
- Using quick relief inhaler/nebulizer more often
- Swelling of ankles more than usual
- More coughing than usual
- I feel like I have a "chest cold"
- Poor sleep and my symptoms woke me up
- My appetite is not good
- My medicine is not helping

**Actions**

- Continue daily medications
- Use quick relief inhaler every ___ hours
- Start an oral corticosteroid (specify name, dose and duration)
- Start an antibiotic (specify name, dose and duration)
- Use oxygen as prescribed
- Get plenty of rest
- Use pursed lip breathing
- At all times avoid cigarette smoke, inhaled irritants*
- Call provider immediately if symptoms don't improve*

**Red Zone: I need urgent medical care**

- Severe shortness of breath even at rest
- Not able to do any activity because of breathing
- Not able to sleep because of breathing
- Fever or shaking chills
- Feeling confused or very drowsy
- Chest pain
- Coughing up blood

**Actions**

- Call 911 or seek medical care immediately
- While getting help, immediately do the following:

*The American Lung Association recommends that the providers select this action for all patients.

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For more information, visit www.Lung.org or call 1-800-LUNG-USA (1-800-586-4872)

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Figure 3. Health status recovery in the event of an exacerbation."
Abbreviation: CCQ, Clinical COPD Questionnaire.