

Utilization of asthma action plans and the acceptability of a new asthma self-management and education tool (ASMET)



Arjun Prakash Tambe, MS^a, Margaret Kuder, MD^b,
Susan J. Corbridge, PhD, ACNP^{c,d},
Todd Lasch, DNP, APRN^c, and Sharmilee M. Nyenhuis, MD^d

Clinical Implications

- Asthma action plans (AAPs) are not systematically used by health care providers. Redesigning of AAPs and improved AAP accessibility for patients and providers could increase AAP usage, leading to improved outcomes in patients with asthma.

TO THE EDITOR:

Evidence-based guidelines support the use of asthma action plans (AAPs) for patient education and self-management. Studies have shown that using AAPs reduces asthma exacerbations and asthma-related hospitalizations.¹⁻³ However, AAPs are not routinely used in clinical practice by physicians or patients.⁴ Potential barriers include limited health care resources, limited time with patients, inadequate understanding of asthma and medications, lack of culturally tailored materials, and poor communication between patients and health care providers (HCPs).^{5,6} Patients generally do not value AAPs, but this is often due to HCPs not reinforcing AAP use and neglecting to update patients' AAPs, making them ineffective.⁴ To address these barriers, we evaluated the use of AAPs, developed the asthma self-management and education tool (ASMET), and assessed the acceptability of the ASMET among patients and HCPs. The purpose of this pilot study was to obtain data from both patients and HCPs to optimize AAPs, establishing a foundation for future investigations.

The ASMET was developed based on the existing literature discussing barriers to AAP use¹⁻³ and previous work by our group.⁷ Created with a medical illustrator, the ASMET uses color and images to guide readers; it also includes educational information on asthma triggers and a proper inhaler technique.

HCPs and patients were recruited from Internal Medicine, Allergy, and Pulmonary clinics at an academic medical center. Inclusion criteria for HCPs were English-speaking and employed at the study institution. Inclusion criteria for patients were English-speaking; age more than 18 years; and a physician diagnosis of asthma.

Verbal consent was obtained from all participants. Interviews of HCPs and patients were conducted to assess the current use of AAPs, barriers to AAP use, and feedback on the ASMET compared with the existing AAP (Figures E1 and E2, available in this article's Online Repository at www.jaci-inpractice.org). The qualitative responses were collated into an Excel sheet and grouped into themes by 2 coders (TL and MK) independently.

The themes were reviewed by a third coder (SJC) if a disagreement occurred. The study was approved by the Institutional Review Board (IRB 2016-0918) in accordance with the approval requirements.

Thirty-nine participants (13 HCPs and 26 patients) were interviewed. A wide variety of HCPs participated, including nurse practitioners, clinical pharmacists, pulmonary fellows-in-training, and physicians. Only half of patients indicated that they had AAPs, and even fewer (27%) used AAPs to manage their asthma (Table 1). Over one-third of HCPs rarely gave AAPs to their patients. When asked why, the HCPs in Allergy and Pulmonology clinics generally cited lack of time, whereas the HCPs in primary care were often unfamiliar with AAPs. Most HCPs indicated that they rarely or never reviewed AAPs with patients; commonly cited reasons were lack of time (62%) and difficulty accessing/distributing AAPs (15%).

Over three-quarters of HCPs indicated that they would be very likely to use the ASMET due to its organization, figures, and color (Table E1, available in this article's Online Repository at www.jaci-inpractice.org). Most HCPs proposed no changes; however, suggestions included: (1) condensing the ASMET to 1 page; (2) creating a Spanish version; and (3) creating an action plan for patients with chronic obstructive pulmonary disease/asthma. Most HCPs wanted the tool available in the electronic medical record or as printed handouts for easy distribution to patients.

Patients were also receptive to the ASMET. All patients felt that it would help them manage their asthma (Table E1, available in this article's Online Repository at www.jaci-inpractice.org). Most patients (69%) stated that the addition of color, figures, and/or improved organization of the ASMET made it easy to understand. Some patients also expressed that including sections on asthma triggers (46%) and how to use inhalers/spacers (19%) was helpful. Most patients (58%) had no proposed changes. Suggested modifications included: (1) expanding the "triggers" section (15%); (2) creating a Spanish version (8%); and (3) creating a portable, wallet-sized version (4%). Furthermore, 62% of patients indicated that they would use a smartphone application (app) for the management of their asthma (Table 1).

In our study, both HCPs and patients reported the infrequent use of AAPs. These findings are consistent with previous studies.^{4,5} We found that HCPs particularly in primary care expressed unfamiliarity with AAPs. Because most patients with asthma are managed in primary care settings, providing increased education to these HCPs could markedly improve patient outcomes.

Although the barriers to AAP use have been documented,^{4,5} the continuing lack of routine AAP use by both HCPs and patients indicates that these barriers have not been adequately addressed. Improving AAP distribution and design by incorporating user feedback is a feasible way to overcome these barriers. HCPs expressed that ease of access was an important factor in determining their use of AAPs. Thus, disseminating AAPs via a smartphone app could significantly increase AAP usage. Many patients in our study were from low-income minority populations, but 73% owned a smartphone, and 62% stated that

TABLE 1. Summary of HCP and patient responses, including current AAP use and receptiveness to the ASMET

	Specialty clinic	Primary care	Total
HCP data (n = 13)*			
Gives AAP to patients			
0%-25% of time	71%	83%	77%
26%-50% of time	14%	17%	15%
51%-75% of time	14%	0%	8%
76%-100% of time	0%	0%	0%
Reviews AAPs with patients			
At every visit	0%	0%	0%
Once per year	14%	17%	15%
Rarely	43%	17%	31%
Never	43%	67%	54%
Likelihood of using ASMET			
Very likely	71%	100%	85%
Would use if shortened	14%	0%	8%
Unlikely to use	14%	0%	8%
Patient data (n = 26)[†]			
Has a current AAP	53%	45%	50%
Uses an AAP			
At any point	33%	18%	27%
Often	0%	0%	0%
Sometimes	27%	18%	23%
Rarely	7%	18%	12%
Never	27%	9%	19%
Would use the ASMET			
At any point	100%	100%	100%
Daily	20%	27%	23%
Weekly	27%	27%	27%
For asthma flares only	47%	54%	50%
Owns a smartphone	80%	64%	73%
Would use an ASMET smartphone app	60%	64%	62%

AAP, Asthma action plan; ASMET, asthma self-management and education tool; HCP, health care provider.

*7 HCPs from specialty clinics; 6 HCPs from primary care.

[†]15 patients from specialty clinics; 11 patients from primary care.

they would use an AAP smartphone application. Although further study is needed to assess different routes of AAP dissemination (eg, printed pamphlet, smartphone app, wallet-sized version, interactive texting, or documents within an online patient portal), our study indicates that improving AAP design and educating patients and HCPs about AAPs may increase use.

Because of its less cluttered layout, the ASMET is 4 pages long, but only the first page of the ASMET necessitates review by the HCP. This page lists medications and doses, which HCPs document in the medical record already. Subsequent pages of the ASMET predominantly contain information for the patient, including personal triggers and a proper inhaler technique. The added detail and improved organization of the ASMET allows patients to understand its content easily and may reduce explanation time needed, helping to overcome the well-documented time barrier. Other members of the health care team (eg, registered nurses and asthma educators) could assist with completion

of the simplified form using prescriptions or patients' medical charts, further reducing time burden on primary care providers. Creation of a separate "portable ASMET" or smartphone application may further enhance ASMET usability. Educational strategies that have used a team-based approach and/or technology appear to be effective, especially in minority populations.⁶ Future study is needed to document whether these changes reduce time to complete AAPs and/or result in increased use by HCPs and patients.

A variety of HCPs are involved in explaining the proper management of asthma to patients. Collaboration between HCPs is especially important in time-constrained settings such as acute asthma exacerbations. In addition, recent evidence has demonstrated improved patient outcomes with team-based care.^{6,8} We adopted an interprofessional approach by obtaining feedback on the ASMET from a variety of HCPs in primary care and specialty asthma clinics, ensuring that the information gathered was broadly relevant to the outpatient setting. Future work could extend to settings such as pediatric outpatient, emergency department, and inpatient. Beginning patient education in the hospital and continuing into the outpatient setting has been shown to reduce patients' health care utilization.⁶ In efforts to reduce health disparities in asthma, cultural tailoring of the ASMET should also be considered.⁶ A limitation of our study was its small sample size; subsequent work should be powered to assess efficacy.

The focus of this pilot study was to obtain data to improve AAPs and establish a basis for future work. Both HCPs and patients had positive reactions to our newly designed ASMET; however, they also provided suggestions on its design and distribution. Over 75% of HCPs indicated that they would be very likely to use the ASMET. Although this number may decrease once in a clinical setting with logistical constraints, it is considerably higher than the 27% of interviewed patients who had an AAP, and it contrasts with our finding that most interviewed HCPs used AAPs only 0% to 25% of the time. The feedback obtained in this study can be used to optimize our ASMET and assess its efficacy and implementation potential. Our findings support further study of the ASMET and serve as the groundwork to strengthen AAPs, a simple yet often overlooked method of improving outcomes in patients with asthma.

^aDepartment of Medical Education, University of Illinois at Chicago, Chicago, Ill

^bDepartment of Allergy/Clinical Immunology, Cleveland Clinic, Cleveland, Ohio

^cDepartment of Biobehavioral Health Science, University of Illinois at Chicago, Chicago, Ill

^dDivision of Pulmonary, Critical Care, Sleep and Allergy, Department of Medicine, University of Illinois at Chicago, Chicago, Ill

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Corresponding author: Sharmilee M. Nyenhuis, MD, Division of Pulmonary, Critical Care, Sleep and Allergy, Department of Medicine, University of Illinois at Chicago, 840 S. Wood St. MC 719, Chicago, IL 60612. E-mail: snyenhui@uic.edu. 2213-2198

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ONLINE REPOSITORY

Asthma Action Plan Template (NOTE: DO NOT COPY TEMPLATE)

Asthma Self Management Action Plan

(***) Fill out Blanks as appropriate:

☐ This action plan was discussed with the patient and a printed copy was provided.

Or

☐ This action plan was discussed with () and a printed copy was provided.

My Best Peak Flow Reading is (***)

GREEN ZONE Peak Flow Reading: More than (***) (80% or more of my best peak flow reading)***Doing Well: I can do all my usual activities*****Symptoms:** No cough, wheeze, chest tightness or

Medications: Take these long-term controller medicines every day

1.

Identify, Avoid and Control for things that make your asthma worse

(List below): shortness of breath during the day or night 2.

1.

3.

2.

4.

3.

☐ Five (5) to sixty (60) minutes **before exercise**, take (***) (short-acting beta2-agonist)
() 2 or () 4 puffs

YELLOW ZONE Peak Flow Reading: (**) to (***) (50% to 80% of my best peak flow reading)**Asthma is Getting Worse****Symptoms:**

Cough, wheeze, chest tightness

or shortness of breath

I am waking at night due to asthma

I can do some, but not all, my usual

ZONE after 1 hour of activities

treatment once

First: ADD Quick-relief medicine and continue your GREEN ZONE medications

(***) (short-acting beta2-agonist)

() 2 puffs every 20 minutes for up to 1 hour **OR** () nebulizer treatment once**Second: If your symptoms and peak flow do not return to the GREEN the above treatment:**() TAKE: (***) (short-acting beta2-agonist) () 2 or () 4 puffs **OR** () nebulizer

() ADD: (***) (oral steroid) (***) mg per day for (**) days (3 to 10 days)

() CALL your primary care doctor (***) (MD name) (***) (telephone number)

RED ZONE Peak Flow Reading: less than (**) (50% of my personal best peak flow reading)
Medical Alert**Symptoms:**

Very short of breath

Quick-relief medicines have not helped

I cannot do usual activities

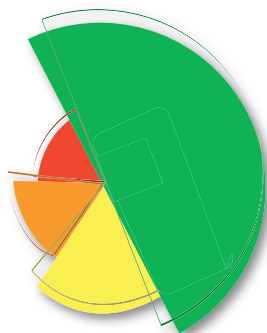
Symptoms are the same or worse after 24 hours in the Yellow Zone

Take this medicine:(***) (short-acting beta2-agonist) () 2 puffs or () 4 puffs **OR** () nebulizer treatment once

(***) (oral steroid) (***) mg NOW

Go to the hospital or call 911 NOW if: You are still in the RED ZONE after 15 minutes, you are having trouble talking due to shortness of breath or your lips or fingernails are blue **(NOTE: DO NOT COPY TEMPLATE)**

FIGURE E1. The old Asthma Action Plan (AAP).



6 STEPS TO BETTER BREATHING

Take control of your asthma, and live a healthier, happier life!

Healthcare Provider Contact:

Jrgent Care:

1 KNOW WHEN TO TAKE YOUR MEDICATIONS

Controllers: Take these every day, even if you don't have symptoms

_____	_____	_____
_____	_____	_____

Rescue Medication: Take if you have an asthma attack and/or symptoms

1. Take your _____, ____ puffs every 20 minutes for up to 1 hour OR nebulizer treatment once.
2. If your symptoms don't improve in an hour, you might need to repeat step 1 or use another medicine. Take your oral Steroid and/or call your healthcare provider.

Medical Alert: Take these when you have severe asthma symptoms

1. Take your oral steroid _____ mg NOW.
2. Continue taking your rescue medicine, ____ puffs OR nebulizer treatment every ____ hours.
3. Call 911 or go to the emergency room immediately.

*If you have problems getting your medication,
call your healthcare provider at*



Center for Lung Health
ASTHMA ACTION PLAN

FIGURE E2. The new Asthma Self-Management and Education Tool (ASMET).

2 WHAT ARE THE SYMPTOMS OF ASTHMA?

	Day	Night
Doing well Your asthma is under control.	• Breathing easily • No coughing or wheezing	• Sleeping soundly at night without cough or trouble breathing
Getting worse If you show any of these signs, use rescue medicine right away, keep using controller medicine, and call your doctor.	• Hurts to breathe deeply • Breathing does not get better within 20 minutes of taking rescue medicine	• Some wheezing or coughing at night • Hard to sleep because of breathing problems
Get help If you have any of these signs, use rescue medicine and go to the emergency room.	• Breathing gets worse within 20 minutes of taking rescue medicine • Hard to walk and/or talk because of your breathing • Continuous trouble breathing	• A lot of wheezing or coughing at night • Trouble sleeping because of breathing problems

3 WHAT TRIGGERS YOUR ASTHMA?



Weather change



Dust



Air pollution

Strong odors
(cleaning supplies,
perfumes)Pests
(rodents, roaches)

Tobacco smoke

My Trigger List:

It's important to know what triggers your asthma. Make a trigger list and discuss it with your doctor!

FIGURE E2. (CONTINUED).

4 IS YOUR ASTHMA UNDER CONTROL?

a Check the boxes that apply to you:

Using Rescue Medication	☐ Less than 2 times per week	☐ 3 or more times per week	☐ Relief lasts less than 2 hours
Daytime Symptoms	☐ Less than 2 days per week	☐ 3 or more days per week	☐ All the time
Nighttime Symptoms	☐ Less than 1 night per month	☐ 1 or more nights per month	☐ Every night
Exercise	☐ Normal	☐ Some interruption	☐ Not able to exercise

b Find your control zone

Controlled If <u>all checks</u> are in the green column, your asthma is under control.	Uncontrolled If you have <u>any checks</u> in the yellow column and zero checks in the red column, your asthma is uncontrolled.	Dangerously Uncontrolled If you have <u>any checks</u> in the red column your asthma is dangerously uncontrolled.
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c Follow these steps

- Take your daily controller medication - Exercise regularly - Avoid your asthma triggers	- Take your rescue medication - Make an appointment with your healthcare provider	- Take your rescue medication - Seek immediate medical assistance - Call 911 or go to Mile Square Urgent Care
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If you are ever unsure of what to do, call your healthcare provider:

Healthcare Provider Contact:
Urgent Care:

FIGURE E2. (CONTINUED).

5 CONTROL YOUR ASTHMA WITH EXERCISE!

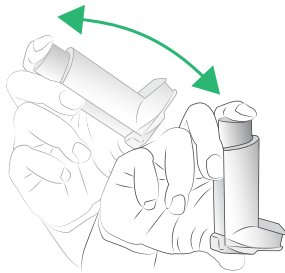
While exercise can trigger asthma symptoms, by following these tips and exercising regularly you can have better asthma control

Exercise Tips:

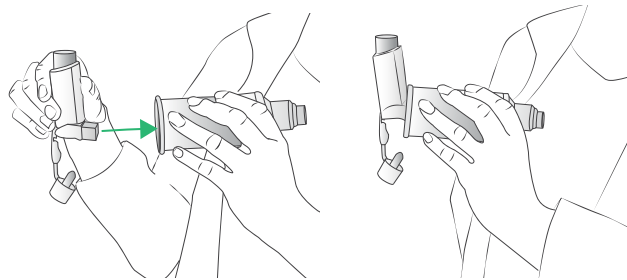
1. Warm up for 5 to 10 minutes before exercising
2. 5 to 60 minutes before you begin to exercise take Albuterol, 2 or 4 puffs
3. Cool down for 5 to 10 minutes after exercising

6 USE YOUR INHALER WITH A SPACER

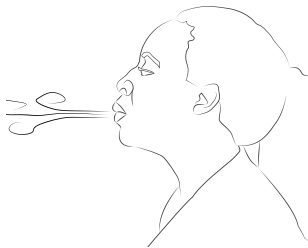
1 Shake & take off cap



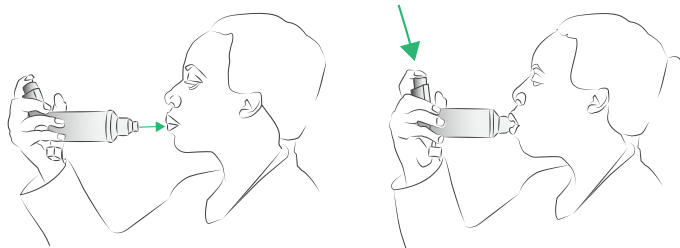
2 Attach the spacer to the inhaler



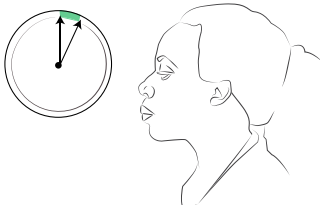
3 Breathe out



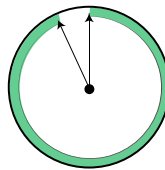
4 Bring spacer up to mouth. Press down on the top of the inhaler. Breathe in deeply and slowly.



5 Hold your breath for 10 seconds.



6 Wait 1 minute while breathing normally. Repeat steps 3 to 5.



7 Rinse -don't swallow

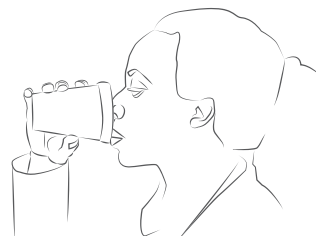


FIGURE E2. (CONTINUED).

TABLE E1. Questions for patients and providers about AAP and ASMET

Questions for patients:

We are interested in helping patients manage their asthma and have developed a new asthma action plan (AAP). We would like to ask you a few questions and get your opinion about this plan to make it better for patients.

1. Do you currently have an AAP? (Show them a copy of the current one)

a. If so, do you use it to help manage your asthma?

i. How often do you use it?

Often

Sometimes

Rarely

Never

ii. Where do you keep it in your home?

b. If not, do you know what an asthma action plan is?

i. If they do not, provide a very brief overview of AAP

ii. Does this sound like something you would use?

2. Would you please take a minute to look at this plan? What stands out about it?

3. Would this plan help you manage your asthma at home? Why or why not?

4. How often would you use this plan?

a. Daily?

b. Weekly?

c. Asthma flares only?

5. What changes could be made to this AAP that would make it easier to use?

6. Do you have/use a smartphone? a. If yes, would you use any type of application (phone app) to help manage your asthma?

7. Do you have any other comments about this plan?

Questions for providers:

We have developed a new AAP and would like to have your opinion on it. We would like to ask you a few questions.

1. How often do you give an AAP to your patients?

a. 0%-25%

b. 26%-50%

c. 51%-75%

d. 76%-100%

2. If you give them, do you review them at least once a year?

a. At every visit?

b. Once a year?

c. Rarely?

d. Never?

3. If you do not use them often, what is the main reason?

4. What is your initial impression of this plan?

5. What do you like about it?

6. What do you see that could be improved?

7. How likely would you be to select this plan to use in patient care?

8. What barriers are there to issuing and reviewing an AAP in your clinic?

9. Do you have any other comments about this plan?

AAP, Asthma action plan; ASMET, asthma self-management and education tool.

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