



By Harold J Farber, MD  
Karen Smith-Wong, RN, NP  
Lynn Nichols, RRT  
Barbara Langham, RN

# Patients Prefer Simple, Visual Asthma Self-Management Plan Forms

## Abstract

**Introduction:** Written asthma self-management plans are recommended by most published asthma guidelines. This study explored patient preferences about asthma self-management plan forms.

**Methods:** Four asthma self-management plan forms were shown to pediatric asthma patients, to their parents, or to patients and parents when they were seen for ongoing evaluation and management of asthma. Patients, their parents, or both were asked to state their choice of an asthma self-management plan form to use in providing written instructions about managing their (or their child's) asthma, why they preferred the form, and why that form was easier to follow.

**Results:** The interview was completed by 21 subjects, including six asthma patients and 15 mothers of asthma patients. Eighteen (86%) of the 21 respondents preferred Form 3, which used pictures from a visual analog scale of asthma severity along with green, yellow, and red colors to describe asthma severity zones. Of the 18 respondents who preferred Form 3, ten said it was easier to read, ten said it was colorful, four said they liked the cartoons, and three mothers said that their child would be able to follow it.

**Conclusion:** In a small convenience sample of interviewees—pediatric asthma patients and their parents—most respondents preferred the asthma action plan form that used color and cartoons to describe asthma severity zones. Use of pictures, color, simplicity, and ease of reading were described as important factors in this preference.

## Introduction

Asthma is the most common chronic illness of children. The annual cost of asthma care in the United States has been estimated at \$11.3 billion,<sup>1</sup> nearly half of which is used to pay for hospitalization and ED visits. Good preventive care for asthma can decrease the need for hospitalization and ED visits.<sup>2</sup> Implementing the behavior changes necessary to achieve good asthma control can be difficult. After patients leave their physician's office, verbal recommendations frequently are not remembered. Written instructions may improve adherence to medical recommendations.<sup>3</sup> Providing written management plans to patients with asthma is recommended in the National Asthma Education and Prevention Program Expert Panel Report<sup>4</sup> and in most other asthma care guidelines.<sup>5,6</sup> Having a written asthma self-management plan is associated with decreased need for hospitalization and ED visits.<sup>7</sup>

***Asthma is the most common chronic illness of children.***

Many different types of forms have been used as templates for asthma management plans. Most instruction forms for asthma care indicate levels of asthma control by using a three-color format in which the green zone shows good asthma control, the yellow zone represents the early signs of an asthma flare, and the red zone means that an asthma flare-up is in progress and that prompt action is needed. Asthma severity zones have been described using either peak expiratory flow rate or symptom criteria. Some instruction forms for asthma care provide extensive detail about asthma management strategies.

Few asthma self-management plan forms use pictures to convey levels of asthma severity.

***Asthma self-management plans that use pictures to communicate about asthma severity may be better received than text-based self-management plans.***

Many patients, particularly those who live in low-income and inner-city areas, may have low literacy skills,<sup>8</sup> and school-age children lack the literacy skills of adults. For these patients, asthma self-management plans that use pictures to communicate about asthma severity may be better received than text-based self-management plans. Fritz et al<sup>9</sup> described a visual analog scale of asthma severity that used pictorial anchors—four cartoons, each showing a child with a particular degree of asthma: “none at all,” “a little,” “quite a bit,” and “very much/terrible.”<sup>9</sup> These cartoons can be used to visually describe green, yellow, and red asthma severity zones.

We developed an asthma self-management plan template (Form 3 in Figure 1a,b) using the cartoons of the pictorial visual analog scale of asthma severity to describe green, yellow, and red zones. We compared patient acceptance of this form with patient acceptance of other text-based asthma self-management plan forms used at our medical center or recommended in the guidelines of the National Asthma Education and Prevention Program Expert Panel Report.<sup>4</sup>

## Methods

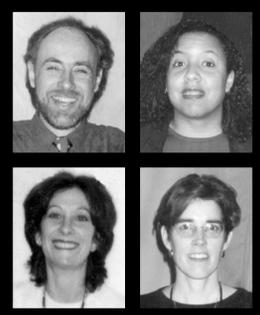
A convenience sample of asthmatic children and their parents were interviewed by

**HAROLD J FARBER, MD**, (top, left) is a Pediatric Pulmonologist and Assistant Chief of Pediatrics at the Kaiser Permanente Medical Center in Vallejo. Along with Michael Boyette, he has authored a book on asthma for the lay public entitled, “Control Your Child's Asthma”. The book is due to be published in May of 2001 by Henry Holt & Co. E-mail: harold.j.farber@kp.org

**KAREN SMITH-WONG, RN, NP**, (top, right) is a Napa/Solano pediatric asthma case manager. She has developed pediatric asthma clinics at Vallejo and Vacaville. She is interested in developing school-based asthma management programs. E-mail: karen.smith-wong@kp.org

**LYNN NICHOLS, RRT**, (bottom, left) is a pediatric and adult asthma case manager at the Kaiser Permanente Medical Center in Vallejo. She is a member of the Napa/Solano asthma task force. She is a frequent speaker on aerosol medication delivery. E-mail: lynn.nichols@kp.org

**BARBARA LANGHAM, RN**, (bottom, right) is a Napa/Solano pediatric asthma case manager. She has played an instrumental role in developing the pediatric asthma clinics at Vallejo and Vacaville. E-mail: barbara.langham@kp.org



their health care practitioners as part of a visit for either asthma care management or pediatric pulmonary consultation. Parents—and children who were old enough to comprehend—were given four asthma self-management plan templates and were asked to state which self-management form they preferred, why they preferred the form, and what makes that particular form easier to follow. The template for Form 1 appeared as Asthma Action Plan Example 6 in guidelines published by the National Institutes of Health.<sup>4</sup> The template for Form 2 was Kaiser Permanente Form 99551, a three-zone (one color each), two-sided, text-based form. The template for Form 3

(Figure 1) was a newly developed form (subsequently adapted as Kaiser Permanente Form 98860 (2-99)) that uses a visual analog scale,<sup>9</sup> color, and text to describe levels of asthma severity. The template for Form 4 was Kaiser Permanente Form 06273, which uses text to describe a four-zone asthma self-management plan. All four forms can be viewed electronically at *The Permanente Journal's* Web site.

**All four forms can be viewed electronically at *The Permanente Journal's* Web site.**

Subjects were advised that the reason for these questions was to help us determine which form to use in clinical practice. Responses were then recorded on an interview record, either directly by the patient (or parent) or by the health care provider on the basis of verbal comments of the patient (or parent).

**Results**

The interview was completed by 21 subjects, 15 of whom were mothers of asthma patients and six of whom were patients themselves. Age of patients whose parents completed the interview ranged from 6 months to 14 years (mean, 9.5 years).

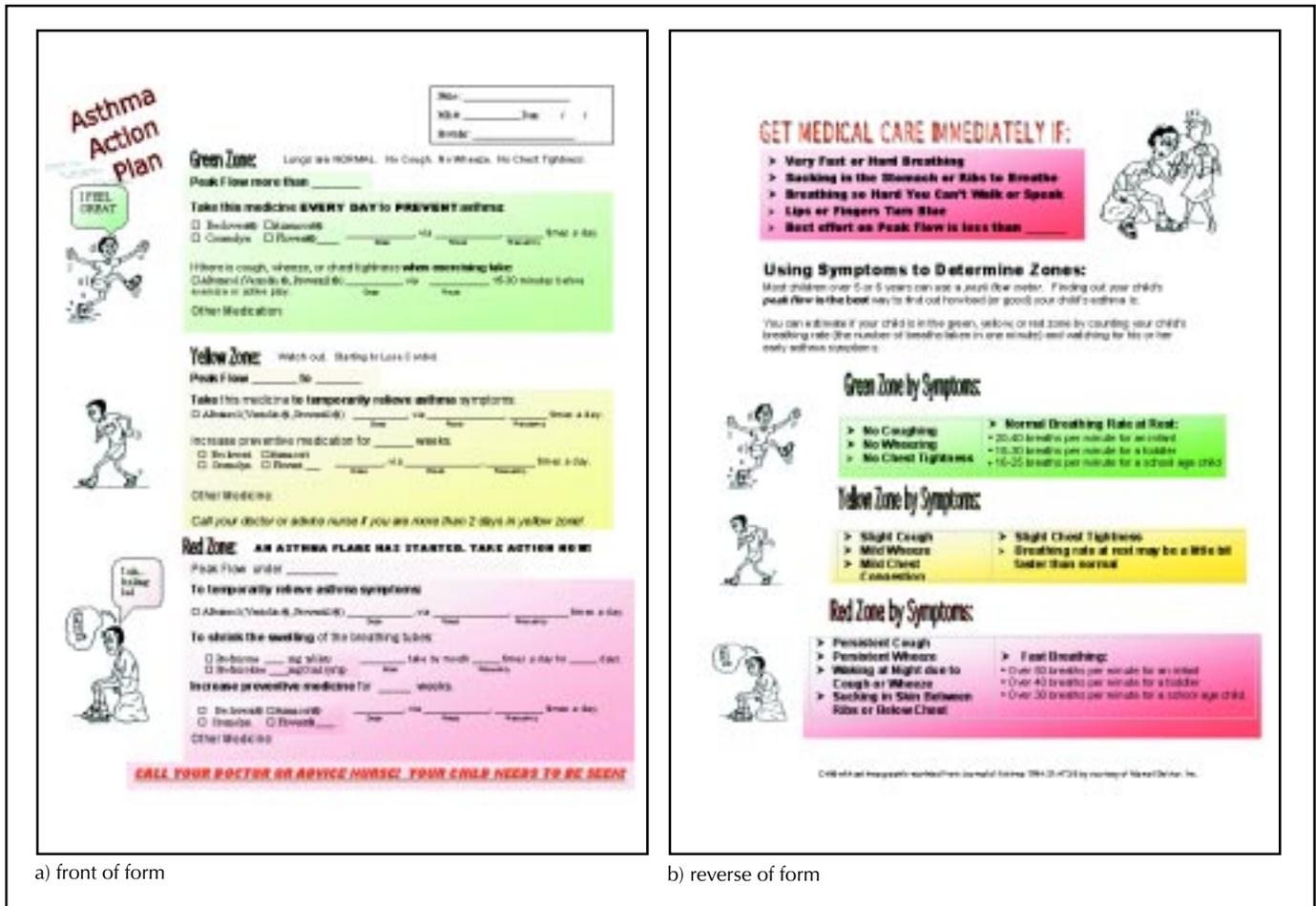


Figure 1. Asthma Action Plan Form 3: A newly developed form that uses a visual analog scale, color, and text to describe asthma severity zones (adapted as Kaiser Permanente Form 98860 (2-99)). Child with asthma illustration adapted and reproduced by permission of the publisher and author from Fritz G, Spirito A, Yeung A, Klein R, Freedman E. A pictorial visual analog scale for rating severity of childhood asthma episodes. *J Asthma* 1994;31(6):473-8.



Patients who completed the interview ranged in age from 9 to 14 years.

Form 3 was preferred by 18 (86%) of 21 subjects. A parent who preferred Form 2 explained, "It is working well, no need to change it." A teenager and a mother who preferred Form 4 stated, "I like having more information." No subjects preferred Form 1.

Among the 18 subjects who preferred Form 3, ten subjects said it was easier to read, ten subjects said it was colorful, four subjects said they liked the cartoons, and three subjects said they believed that their child would be able to follow it. Illustrative comments from patients explaining their preference for Form 3 included, "You don't have to sit and read the whole thing—it is right there"; "It has details written in the way I can interpret them"; "Information seems simple and to the point"; "If I have to leave this with my daycare provider, this [the form] is easy [for the daycare provider] to look at"; "[The form is] eye catching"; "[The instructions are] all on same page"; "[The form is good] because some people can't read that well"; and "He (the child) can look at it too and see [the instructions]."

***Adherence was not measured, a reasonable speculation is that adherence to asthma care instructions might improve if they are given in a way that is better accepted by the patient.***

## Discussion

The results of this study suggest that color and pictures used to describe levels of asthma severity are better accepted than text-based written instruction sheets. Al-

though the effect of different plan forms on patient adherence was not measured, a reasonable speculation is that adherence to asthma care instructions might improve if they are given in a way that is better accepted by the patient—in this case, as illustrated instruction sheets.<sup>3</sup>

***Limited literacy characterizes large segments of the population and restricts the effectiveness of text-based asthma self-management plans.***

This study is limited by the small number of subjects interviewed and by the patient population from which they were selected: Our medical center serves a large number of lower-income, working-class, and Medicaid-insured patients, and our results may not be generalizable to highly literate, upper-income patients. Ethnicity and income of subjects were not recorded.

Limited literacy characterizes large segments of the population and restricts the effectiveness of text-based asthma self-management plans, which rely on written words to communicate with patients. In addition to levels of asthma severity, printed instruction sheets should use pictures to describe medications to be taken, because many parents know their child's inhalers by color and not by name. Further research is needed to develop and validate a written asthma instruction sheet that uses pictures to describe severity zones as well as medications to be taken.

## Conclusion

In a small convenience sample of asthmatic children and their mothers, most respondents preferred the simplified asthma

management form that used both a cartoonlike visual analog scale and color to describe asthma severity zones. Pictures, color, simplicity, and ease of reading were described as important factors in these respondents' preference for one form over others. We speculate that use of an asthma self-management plan that is both easier to understand and well accepted may facilitate adherence to that plan. ♦

## References

1. National Heart, Lung, and Blood Institute. Data fact sheet: asthma statistics. Bethesda, MD: National Institutes of Health, National Heart Lung and Blood Institute; 1999. p 3.
2. Zeiger RS, Heller S, Mellon MH, Wald J, Falkoff R, Schatz M. Facilitated referral to asthma specialist reduces relapses in asthma emergency room visits. *J Allergy Clin Immunol* 1991 Jun;87(6):1160-8.
3. Meichenbaum D, Turk DC. Facilitating treatment adherence: a practitioner's guidebook. New York: Plenum Press; 1987. p 129.
4. National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. Expert Panel Report 2: Guidelines for the diagnosis and management of asthma. [Bethesda, MD:] National Institutes of Health, National Heart, Lung, and Blood Institute; 1997. (NIH Publication No. 97-4051)
5. Global initiative for asthma: global strategy for asthma management and prevention NHLBI/WHO workshop report (based on a March 1993 meeting). Bethesda, MD: National Institutes of Health, National Heart, Lung, and Blood Institute; 1995.
6. Kaiser Permanente Northern California clinical practice guidelines. Management of asthma in children. Pediatric Asthma Guideline Team, 1998 Revision. Available on the World Wide Web (accessed January 31, 2001): [http://clinical-library.ca.kp.org/SearchTest/Browse\\_Clinical\\_Guidelines.htm](http://clinical-library.ca.kp.org/SearchTest/Browse_Clinical_Guidelines.htm)
7. Lieu TA, Quesenberry CP Jr, Capra AM, Sorel ME, Martin KE, Mendoza GR. Outpatient management practices associated with reduced risk of pediatric asthma hospitalization and emergency department visits. *Pediatrics* 1997 Sep;100(3 Pt 1):334-41.
8. Farber HJ, Johnson C, Beckerman RC. Young inner-city children visiting the emergency room (ER) for asthma: risk factors and chronic care behaviors. *J Asthma* 1998;35(7):547-52.
9. Fritz G, Spirito A, Yeung A, Klein R, Freedman E. A pictorial visual analog scale for rating severity of childhood asthma episodes. *J Asthma* 1994;31(6):473-8.