value of forced expiratory volume in 1 second to forced vital capacity adjusted for age, sex, and race.

Results. The highest BMI quintile (ie, the most obese participants) had the greatest risk of self-reported asthma (odds ratio [OR]: 1.50; 95% confidence interval [CI]: 1.24–1.81), bronchodilator use (OR: 1.94; 95% CI: 1.38–2.72), and dyspnea with exertion (OR: 2.66; 95% CI: 2.35–3.00). Paradoxically, the highest BMI quintile had the lowest risk for significant airflow obstruction ($P = .001$).

Conclusions. This study demonstrates that while obesity is a risk factor for self-reported asthma, obese participant are at a lower risk for (objective) airflow obstruction. Many more obese than nonobese participants were using bronchodilators despite a lack of objective evidence for airflow obstruction. These data suggest that mechanisms other than airflow obstruction are responsible for dyspnea genesis in obesity and that asthma might be overdiagnosed in the obese population.

Reviewer's Comments. The obvious problem with this study is that a single measure of airflow cannot be considered diagnostic for asthma. Nonetheless, it is unlikely that this study population was gathered to answer specific questions about asthma. My guess is that the authors gathered a lot of information about their obese population (including baseline spirometry) and later went back to see if they could make inferences regarding asthma. It's a lesson on how this is not the best way to conduct clinical research. On the other hand, I suppose it points out that not all dyspnea (even that which is reported to improve with bronchodilators) represents asthma.

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DIAGNOSIS AND MANAGEMENT

IMPROVING ASTHMA OUTCOMES AND SELF-MANAGEMENT BEHAVIORS OF INNER-CITY CHILDREN

Guendelman S, Meade K, Benson M, et al. ***Arch Pediatr Adolesc Med.*** **2002;156:114–120**

Purpose of the Study. To investigate whether the use of a home-based computerized interactive device using the Internet improves education and self-management of pediatric asthma.

Study Population. One hundred thirty-four children diagnosed with persistent asthma between 8 and 16 years of age recruited from the primary care clinic at a children's hospital serving primarily inner-city children.

Methods. Randomized, controlled trial with 66 children in the intervention group and 68 children in the control group. Both groups participated in a standardized teaching session on peak flow monitoring and appropriate use of medications. The intervention group received an interactive communication device (Health Buddy) that posed a set of queries each day consisting of symptoms, peak flows, medication use, functional status. The control group monitored their symptoms with a standard asthma diary. All children returned for 2 follow-up visits at 6 and 12 weeks. Measures for the study were compiled from interviews conducted at each visit.

Results. Children in both groups of the study reported a decrease in asthma symptoms and a decrease in peak flow readings in the yellow or red zone at 6 and 12 weeks compared with baseline. Fewer children in the Health Buddy group had yellow or red zone peak flows ($P = .02$). The intervention group was less likely to report limitation in activity ($P = .03$), and less likely to make urgent calls to the hospital ($P = .05$).

Conclusions. Children randomized to the Health Buddy were more likely to improve the degree of compliance with prescribed medications and to reduce asthma symptoms, while making fewer urgent calls.

Reviewers' Comments. This study illustrates the need for good asthma education to help reinforce symptom awareness and medication compliance for patients and their families. It is likely that the newly diagnosed and those with a difficult medication regimen would receive greatest benefit. A longer study stratifying patients' asthma severity would be helpful in pursuit of this idea. One could certainly envision the utility of this type of program in the immediate postexacerbation period, as well as during problematic months. Future studies of the Health Buddy need to address cost-effectiveness and long-term usage.

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SYMPTOM MONITORING IN CHILDHOOD ASTHMA: A RANDOMIZED CLINICAL TRIAL COMPARING PEAK EXPIRATORY FLOW RATE WITH SYMPTOM MONITERING

Yoos HL, Kitzman H, McMullen A, et al. ***Ann Allergy Asthma Immunol.*** **2002;88:283–291**

Purpose of the Study. The purpose of this study was to evaluate the effects of 3 different regimens of symptom monitoring on asthma morbidity outcomes.

Study Population. One hundred sixty-eight children aged 6 to 19 years who had >3 asthma-related health care visits in the previous 12 months. The children were recruited from 11 different primary care sites and of diverse racial, geographic, and socioeconomic backgrounds.

Methods. Patients were randomized into 1 of 3 treatment groups. Treatment groups were: group 1, subjective symptom monitoring; group 2, peak expiratory flow rate (PEFR) monitoring when symptomatic; and group 3, PEFR monitoring twice daily and when symptomatic. In the beginning of the study, all families received education on asthma triggers, asthma symptom recognition, symptom management, and medications. A 2-week practice period included formulating a personal action plan that specified changes in management strategy based on symptoms or PEFR. A weekly diary was obtained for 3 months. Outcome measures included an asthma severity score (a composite score of symptom frequency, symptom duration, activity limitation, nighttime symptoms, and days missed from school), forced expiratory volume in 1 second (FEV_1), symptom days, and health care utilization.

Results. Children who used PEFR meters when symptomatic had a lower asthma severity score, fewer symptom days, and less health care utilization than children in the other 2 treatment groups. Minority and poor children had the greatest improvement using peak flow meters (PFMs) when symptomatic. Results were less dramatic in white families. Thirty percent of families discontinued daily PFM use by 1 year after exiting the study, while 94% of families continued to use PFMs when symptomatic.

Conclusions. Not all children with asthma need PFMs. Children and families who face extra challenges as a result of illness severity, sociodemographic, or health care system characteristics clearly seemed to benefit most from PFM usage.

Reviewer's Comments. This article supports the National Heart, Lung, and Blood Institute guidelines, which recom-

mend objective symptom monitoring for children with moderate-to-severe asthma. Often it is felt that patients will only adhere to the most simple of medical treatment strategies, which in this study would have been the group with subjective symptom monitoring. Instead, this study revealed that the intermittent use of PEFR monitoring not only was the most beneficial, but also was easy enough for most families to continue 1-year postintervention. Although not all children receive the same level of benefit from PEFR, a PFM should be offered to all patients >5 who have persistent symptoms. An important feature, which was not well-addressed, was the benefit all the children received from the intensive asthma education at the start of the study.

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DEMONSTRATED USE OF METERED-DOSE INHALERS AND PEAK FLOW METERS BY CHILDREN AND ADOLESCENTS WITH ASTHMA EXACERBATIONS

Scarfone RJ, Capraro GA, Zorc JJ, Zhao H. ***Arch Pediatr Adolesc Med.*** **2002;156:378–383**

Purpose of the Study. To measure the ability of children and adolescents with acute asthma exacerbations to adhere to the National Heart, Lung, and Blood Institute (NHLBI) guidelines for proper metered-dose inhaler (MDI) and peak flow meter (PFM) techniques and to define characteristics associated with improper use.

Study Population. Children 2 to 18 years old who came to the emergency department of an urban tertiary care center with an asthma exacerbation (history of at least 2 episodes of wheezing that required bronchodilator therapy).

Methods. This is a prospective study where patients were asked to demonstrate their use of a placebo MDI, with or without an Aerochamber (Trudell Medical, London, Ontario, Canada), exactly as they would use it at home. Patients were observed by an investigator. Various variables were assessed including morbidity, patient, parent, and primary care provider factors. The use of PFM was similarly assessed in a separate group of patients. NHLBI recommendations were followed in both groups.

Results. Among 208 patients in the MDI group, approximately 90% of patients were African American and about 60% were Medicaid managed care of self-pay. Seventy-three (35.1%) patients did not use a holding chamber (HC) and 135 (64.9%) used a HC. In both subgroups, about 45% of patients demonstrated multiple steps improperly. Errors were found in all of the steps including shaking, exhaling before MDI usage, inhaling with actuation and holding one's breath after inhalation. Young ages of the patients and the parents were associated with improper use. In the MDI-HC group, factors significantly associated with improper use were no hospitalizations within the past year, parent assistance with the patient with MDI-HC use, and nondaily use of the MDI-HC. On the other hand, 165 (82.9%) of 199 children who, per national guidelines, should be using a PFM at home, did not. Eighty-two (73.9%) of 111 patients demonstrated perfect performance of all PFM steps.

Conclusions. Among this group of inner-city children with acute asthma there is lack of knowledge and low adherence to proper MDI use. There should be greater emphasis on teaching the appropriate way of using MDIs. In addition, PFM technique was usually correct but they were underused and underprescribed.

Reviewers' Comments. This study uniquely evaluated each step of MDIs and PFM use among children with asthma exacerbations in an emergency room (ER) setting. Once again we are reminded of the importance of teaching and reviewing inhaler technique with patients and parents alike. The study also shows that most patients can use peak flow meters correctly although they were not being used. This article challenges us all to do better.

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PROVIDERS UNDERESTIMATE SYMPTOM SEVERITY AMONG URBAN CHILDREN WITH ASTHMA

Halterman JS, Yoos L, Kaczorowski JM, et al. ***Arch Pediatr Adolesc Med.*** **2002;156:141–146**

Purpose of the Study. To evaluate the use of preventative asthma medications in an urban population of children with mild persistent to severe persistent asthma and to evaluate the accuracy of classification of asthma severity by health care providers.

Study Population. Children 4 to 6 years old from 33 urban schools in Rochester, New York, enrolled in a longitudinal clinical trial. Asthmatic children were identified through a school-based health screening survey. Of 322 asthmatic children, 92 (67%) were enrolled.

Methods. Telephone survey reviewing sociodemographic characteristics, health care contacts, and medication use. A written questionnaire was sent to health care providers to evaluate each child's health care utilization, asthma severity, and medication use. Information was based on personal knowledge and review of the medical record. Provider response rate was 98%. Eligibility was based on an asthma severity rating of mild persistent or worse. Symptom criteria were derived from the National Heart, Lung, and Blood Institute (NHLBI) guidelines (1997), which included: 1) days with asthma symptoms and 2) nights with asthma symptoms. Statistical analysis was performed using standard cross-tabulations and χ^2 analyses. Logistic regression was used for multivariate analysis.

Results. Seventy percent of patients had ≥3 days/week with asthma symptoms and 68% had ≥3 nights/month with asthma symptoms. Patient characteristics: 4 years, 27%; 5 years, 38%; 6 years, 35%; male, 64%; white, 8%; black, 67%; other, 25%; Hispanic, 30%; and Medicaid, 73%. Fifty percent of patients were prescribed maintenance medication, 41% actually had the maintenance medication, and 36% used maintenance medication. Comparing accurately to inaccurately classified patients 83% versus 28% were prescribed maintenance medicines (meds), 64% versus 26% had maintenance meds, and 58% versus 20% used maintenance meds. Patients observed in the office within past 6 months were more likely to be accurately classified (47% vs 25%). If the family reported that they believed the provider was aware versus unaware of asthma severity, the classification was more likely to be accurate (46% vs 20%).

Conclusions. This study reveals that inaccurate classification of asthma severity by providers, as well patient compliance with medications regimens, is a significant impediment to optimal asthma management. When patients were appropriately classified, maintenance medications were commonly prescribed. Incomplete communication between patient's families and providers is believed to contribute to inaccuracy of classification.

SYMPTOM MONITORING IN CHILDHOOD ASTHMA: A RANDOMIZED CLINICAL TRIAL COMPARING PEAK EXPIRATORY FLOW RATE WITH SYMPTOM MONITERING

Helen Skolnick

Pediatrics 2003;112;474

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