ACT and ACQ results, rated asthma control on a 5-point Likert scale (not completely controlled to completely controlled) based on history, physical examination, FEV₁ scores, and National Asthma Education and Prevention Program–defined goals for asthma control. Reliability, validity, and responsiveness were all tested via comparison of the ACT results to the specialists’ evaluation, the ACQ scores, and the FEV₁ scores.

RESULTS. Participants (N = 313) had a mean age of 35 years (12–84 years). At baseline, specialists rated asthma control as well controlled or completely controlled (48%), somewhat controlled (29%), and not controlled (23%). The reliability of the ACT was tested by internal consistency and test-retest methods. The internal consistency was .85 for the initial visit (n = 313) and .79 for the follow-up visit (n = 248). The test-retest assessment among 86 patients with the same specialist rating for asthma was .77. The criterion validity was based on comparisons between the ACT scores at the baseline visit and the specialists’ assessment as well as the ACQ scores and FEV₁ values. All of these comparisons were found to be statistically significant. The discriminant validity was measured in 3 ways: the asthma specialists’ rating, percent predicted value of FEV₁, and treatment recommendation of the asthma specialists. As predicted, patients with low ACT scores correlated with diagnoses of poorer control by asthma specialists. Patients with low FEV₁ scores also scored lower on the ACT, and patients who required an increase in their therapy had lower scores on this questionnaire. The responsiveness of the ACT was also measured by assessing the changes in scores between the initial and follow-up visits. Moderate correlations existed between the ACT and the asthma specialist’s score, whereas changes in the ACT and ACQ were found to be highly consistent. Changes in FEV₁ and ACT were only minimally correlated. An ACT score of ≤19 identified patients with poorly controlled asthma (71% sensitivity; 71% specificity).

CONCLUSIONS. The ACT was reliable, valid, and responsive to changes in asthma control over time in a sample of patients who were new to the care of an asthma specialist.

REVIEWER COMMENTS. These authors have further shown the value of the ACT in assessing asthma control in the practice of asthma specialists. In a day when physicians are pressed for time when evaluating patients, it is important to find effective tools that are reliable, valid, responsive, and practical to assist in patient evaluations. Additional work is needed to assess the usefulness of the ACT within primary care, where it may prove to be even more valuable in assessing asthma control.

The Influence of Variation in Type and Pattern of Symptoms on Assessment in Pediatric Asthma
Fuhlbrigge AL, Guilbert T, Spahn J, Peden D, Davis K.
Pediatrics. 2006;118:619–625

PURPOSE OF THE STUDY. To examine the asthma-related health burden in US children.

STUDY POPULATION. Participants were US children (aged 4 to 18 years) with current asthma during February to May, 2004, identified in a telephone-based survey. Asthma was defined as ever having a physician diagnosis of asthma and either using current asthma medication or having asthma symptoms in the past year.

METHODS. In this telephone-based study, 41433 households were screened to provide 1089 children reporting current asthma and 801 completed interviews. Interviews were completed by parents for children 4 to 15 years old (84.6%) and the children themselves when they were 16 to 18 years old (14.6%). Symptoms, perceived level of control, activity limitation, health care use, medications, disease management, and knowledge were assessed. Global asthma-symptom burden was composed of short-term symptom burden (4-week recall), long-term symptom burden (past year), and functional impact (activity limitation) based on National Asthma Education and Prevention Program (NAEPP) guidelines. Asthma was classified on the basis of symptoms in 3 categories: mild-intermittent, mild-persistent, and moderate/severe-persistent (combined into 1 category) asthma.

RESULTS. Eighty percent of the children were classified as having mild-intermittent asthma on the basis of daily symptoms; however, this percentage decreased to 64% when nighttime symptoms were considered. In contrast, on the basis of the global asthma-symptom burden, only 13% of the children were classified as having mild-intermittent disease, whereas 62% were classified as having moderate/severe disease. Of children with moderate/severe asthma, 54% reported complete asthma control despite meeting criteria for more moderate/severe-persistent disease. Asthma impact on daily activity was substantial, with 47% of the children avoiding exertion and 34% staying inside to control asthma symptoms.

CONCLUSIONS. The majority of children had not achieved the goals of asthma treatment based on NAEPP guidelines. In addition, parents and their children overestimated the child’s asthma control and commonly restricted activities to control asthma symptoms.

REVIEWER COMMENTS. Why is there a rift between what patients or their parents perceive as their level of asthma control and their actual control measured against NAEPP-guideline goals? The level of control perceived by pa-
patients and their parents seems worse when more detailed or specific questions are asked about asthma burden. As demonstrated by this study, limitation in activity level or staying indoors are “common” methods to control asthma symptoms despite contradictory reporting that exercising and participating in outdoor activities are important to children. Unfortunately, many children are not meeting the NAEPP guidelines’ goals of removing self-imposed limitations to control a child’s asthma. It is notable that this study did not account for current asthma medications that could result in underclassification of disease burden. This study provides another wake-up call that asking specific questions during patient encounters and education regarding symptom-control expectations are worthwhile, because there can be misperception of control by patients and their parents.

Classification of Asthma Severity in Children: The Contribution of Pulmonary Function Testing

PURPOSE OF THE STUDY. To evaluate whether adding lung-function measurements to clinical history changes asthma-severity classification and, thus, treatment decisions.

STUDY POPULATION. Inner-city children with asthma from 2 asthma study cohorts: 257 children from cohort 1 (1992–1994) and 383 from cohort 2 (1998–2001). On the basis of the age range of the available reference for pulmonary-function values, analyses were restricted to children aged 8 to 11 years.

METHODS. Data collected from both studies included a comprehensive history, allergy skin testing, and pulmonary-function tests. Each child’s asthma severity was classified according to the National Asthma Education and Prevention Program (NAEPP) Expert Panel Report 2 guideline on the basis of their symptom frequency alone. Participants were classified into 3 severity levels: mild-intermittent, mild- persistent, and moderate-to-severe–persistent asthma. Then, those participants with abnormal results of the pulmonary-function test (forced expiratory volume in 1 second [FEV₁] and/or peak expiratory flow [PEF] rate) were reclassified on the basis of symptom-frequency and pulmonary-function data.

RESULTS. Among children with symptoms consistent with mild-intermittent asthma, 22.8% in cohort 1 and 27.7% in cohort 2 would be reclassified as having moderate-to-severe–persistent asthma. Among children with symptoms consistent with mild-persistent asthma, 31.2% in cohort 1 and 33.3% in cohort 2 would be reclassified as having moderate-to-severe–persistent asthma. Among children who were already classified as having moderate-to-severe–persistent asthma according to their symptoms alone, 22.3% in cohort 1 and 44.2% in cohort 2 had abnormal pulmonary function.

CONCLUSIONS. Approximately one third of the children in each cohort were reclassified to higher NAEPP asthma-severity categories when pulmonary function was considered in addition to symptom frequency. The results demonstrate that the current NAEPP severity-assessment algorithm is highly dependent on the availability of symptom-frequency and pulmonary-function data.

Exhaled Nitric Oxide in Asthma: Variability, Relation to Asthma Severity, and Peripheral Blood Lymphocyte Cytokine Expression

PURPOSE OF THE STUDY. To measure and compare exhaled nitric oxide (eNO) levels in patients with asthma and healthy volunteers, to study peripheral blood lymphocyte cytokine expression, and to study the relationship between eNO and intracellular cytokine expression.

STUDY POPULATION. A total of 36 subjects were enrolled onto the study, with 19 asthmatic patients and 17 healthy control subjects.

METHODS. At least once per week for 4 weeks, patients with asthma visited the clinic and underwent a detailed history, physical examination, spirometry, and eNO-level measurement. These patients were maintained on established pharmacologic therapy regimens. A blood
# The Influence of Variation in Type and Pattern of Symptoms on Assessment in Pediatric Asthma

Mark H. Moss

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