included bivariate statistics and linear regression models, assessed longitudinally by blinded interviewers. Analyses trial of SB-PACT versus usual care. Outcomes were 98% of the time they were in school. Over the school year, Treatment group children received preventive medications directly observed therapy as authorized by their providers. System, and 44 of 49 treatment group children received di-investigators screened all children by using a Web-based symptom screening, electronic report generation, and med-ication authorization from providers. 

**RESULTS.** There were data for 99 subjects for analysis. The

**METHODS.** The investigators conducted a pilot, randomized trial of SB-PACT versus usual care. Outcomes were assessed longitudinally by blinded interviewers. Analyses included bivariate statistics and linear regression models, adjusting for baseline symptoms.

**RESULTS.** There were data for 99 subjects for analysis. The investigators screened all children by using a Web-based system, and 44 of 49 treatment group children received directly observed therapy as authorized by their providers. Treatment group children received preventive medications 98% of the time they were in school. Over the school year, children in the treatment group experienced nearly 1 additional symptom-free day over 2 weeks versus the usual care group (11.3 vs 10.40, \( P = .13 \)). Treatment children also experienced fewer nights with symptoms (1.68 vs 2.20, \( P = .02 \)), days requiring rescue medications (1.66 vs 2.44, \( P = .01 \)), and days absent from school due to asthma (0.37 vs 0.85, \( P = .3 \)) compared with usual care. Further, treatment children had a greater decrease in inhaled nitric oxide (−9.62 vs −0.39, \( P = 0.03 \)) suggesting reduction in airway inflammation.

**CONCLUSIONS.** The SB-PACT intervention demonstrated fea-sibility and improved outcomes across multiple measures in this pilot study. Future work will focus on further inte-gration of preventive care delivery across community and primary care systems.

**REVIEWER COMMENTS.** I applaud these investigators not only on their previous work with their school-based asthma therapy trial from 2006 to 2009 (Arch Pediatr Adolesc Med 2011;165:262–268) that directly observed administration of preventive asthma medications in the school setting, but this current SB-PACT study, which used a Web-based program to overcome key barriers to sustainability identi-fied in their original study. This pilot study of school-based asthma care was effective in reducing morbidity for children at high risk with asthma. The Web-based screen-ing mechanism worked efficiently for most participants and primary care physicians involved in terms of commu-nication and systematic medication delivery. Children receiving this intervention experienced fewer asthma symptoms, less absenteeism from school, and had reduced airway inflammation. It will be very interesting to see how future studies with larger sample sizes can help to effectively reduce the overall morbidity among high-risk school aged children with asthma. Keeping our asthmatic children healthy and in school where they can learn effectively should be the primary goal here!

**URL:** www.pediatrics.org/cgi/doi/10.1542/peds.2013–2294000

Jennifer S. Kim, MD
New York, NY

---

The School-Based Preventative Asthma Care Trial: Results of a Pilot Study

**PURPOSE OF THE STUDY.** To test the feasibility and preliminary effectiveness of the School-Based Preventative Asthma Care Technology (SB-PACT) program, which included directly observing therapy of preventive asthma medications in school facilitated by Web-based technology for systemic symptom screening, electronic report generation, and medication authorization from providers.

**STUDY POPULATION.** The study included 100 children (aged 3–10 years) with physician-diagnosed asthma with persistent symptoms based on National Heart, Lung, and Blood Institute guidelines from 19 inner-city schools in Rochester, New York.

**METHODS.** The investigators conducted a pilot, randomized trial of SB-PACT versus usual care. Outcomes were assessed longitudinally by blinded interviewers. Analyses included bivariate statistics and linear regression models, adjusting for baseline symptoms.

**RESULTS.** There were data for 99 subjects for analysis. The investigators screened all children by using a Web-based system, and 44 of 49 treatment group children received directly observed therapy as authorized by their providers. Treatment group children received preventive medications 98% of the time they were in school. Over the school year, children in the treatment group experienced nearly 1 additional symptom-free day over 2 weeks versus the usual care group (11.3 vs 10.40, \( P = .13 \)). Treatment children also experienced fewer nights with symptoms (1.68 vs 2.20, \( P = .02 \)), days requiring rescue medications (1.66 vs 2.44, \( P = .01 \)), and days absent from school due to asthma (0.37 vs 0.85, \( P = .3 \)) compared with usual care. Further, treatment children had a greater decrease in inhaled nitric oxide (−9.62 vs −0.39, \( P = 0.03 \)) suggesting reduction in airway inflammation.

**CONCLUSIONS.** The SB-PACT intervention demonstrated fea-sibility and improved outcomes across multiple measures in this pilot study. Future work will focus on further inte-gration of preventive care delivery across community and primary care systems.

**REVIEWER COMMENTS.** I applaud these investigators not only on their previous work with their school-based asthma therapy trial from 2006 to 2009 (Arch Pediatr Adolesc Med 2011;165:262–268) that directly observed administration of preventive asthma medications in the school setting, but this current SB-PACT study, which used a Web-based program to overcome key barriers to sustainability identi-fied in their original study. This pilot study of school-based asthma care was effective in reducing morbidity for children at high risk with asthma. The Web-based screen-ing mechanism worked efficiently for most participants and primary care physicians involved in terms of commu-nication and systematic medication delivery. Children receiving this intervention experienced fewer asthma symptoms, less absenteeism from school, and had reduced airway inflammation. It will be very interesting to see how future studies with larger sample sizes can help to effectively reduce the overall morbidity among high-risk school aged children with asthma. Keeping our asthmatic children healthy and in school where they can learn effectively should be the primary goal here!

**URL:** www.pediatrics.org/cgi/doi/10.1542/peds.2013–2294000

John M. James, MD
Fort Collins, CO

---

Disagreement Among Common Measures of Asthma Control in Children

**PURPOSE OF THE STUDY.** The primary goal of asthma manage-ment is control. This can be assessed by history, physical examination, and measurement of lung function. There are multiple methods to measure control. The purpose of this study was to describe agreement among different measures of asthma control in children.

**STUDY POPULATION.** Atopic children ages 4 to 11 with chronic asthma attending routine follow-up examinations. Asthma
was defined as chronic cough or wheezing responsive to bronchodilator. Atopy was defined as a positive skin prick test and symptoms consistent with allergic rhinitis. Patients were on inhaled corticosteroids for asthma and nasal steroids for allergic rhinitis. They had to be able to perform spirometry and not be on oral steroids.

METHODS. Observations were made in a 4-step sequence: (1) exhaled nitric oxide fraction (FeNO) measurement with a portable NIOX MINO (Aerocrine Inc, Morrisville, NC; ≤35 ppb = controlled, >35 ppb = uncontrolled); (2) spirometry (forced expiratory volume in 1 second ≥80%, forced expiratory flow, midexpiratory phase ≥60%, peak expiratory flow rate ≥80% and forced expiratory volume in 1 second/forced vital capacity ≥80% = controlled); (3) childhood Asthma Control Test (cACT) (<19 = uncontrolled); and (4) clinical assessment by a pediatrician without knowledge of preceding results.

RESULTS. A total of 71 children (mean age 8.4 years; 46 boys and 25 girls) completed the study. The mean FeNO is uncontrolled asthma and was 37 ppb vs 15 ppb in controlled asthma (P < .005) but with considerable overlap. Comparison of individual spirometric indices revealed some correlation, but of the unrelated comparisons, those that agreed with each other most often (69%) were clinical assessment by the pediatrician and the cACT. Worst agreement was noted for FeNO and cACT (49.3%).

CONCLUSIONS. Overall this study revealed significant disagreement among many of the common methods used to assess asthma control.

REVIEWER COMMENTS. Asthma control is the key to successful management, and assessment of control is recommended in all major guidelines. It is nice to have different measures to choose from but disheartening to see the lack of agreement between tests. Previous studies have also shown a lack of agreement between many of these measures. The authors speculate that taking the individual patient’s asthma phenotype into consideration may be the key and that a combination of physician assessment and objective testing will be required. We continue to wait for the perfect test or combination of tests.

STUDY POPULATION. Five hundred thirty children in a prospective population-based birth cohort underwent a methacholine challenge and exercise challenge on separate days at age 10 years. At age 16 years, they underwent a clinical evaluation and repeat methacholine challenge.

METHODS. BHR was scored as follows based the methacholine dose causing a 20% drop in FEV1 (PD20): severe ≤1 μmol, mild to moderate 1 to 8, and borderline 8 to 16. Exercise-induced bronchospasm (EIB) is defined as ≥10% reduction in forced expiratory volume in 1 second 3 to 20 minutes after running. Active asthma is defined as at least 2 of the following: doctor’s diagnosis of asthma, asthma symptoms during the last 12 months, and use of asthma medication during the last 12 months.

RESULTS. Active asthma at age 16 was observed in 74% of the children with active asthma, and 10% of children without active asthma, at age 10. Fifty-four percent of the children with methacholine PD20 ≤1 μmol at age 10 had active asthma at age 16, 30% with PD20 1 to 8, 26% with PD20 8 to 16, and 31% with EIB. Separately the tests explained 10% (methacholine) and 7% (exercise) and together 14% of the variation in active asthma at age 16. In multivariate analysis, only methacholine PD20 ≤1 and active asthma at age 10 were risk factors for active asthma at age 16.

CONCLUSIONS. BHR at 10 years was a significant but modest predictor of active asthma 6 years later, with methacholine challenge being superior to exercise test.

REVIEWER COMMENTS. Not surprisingly, having methacholine-induced bronchospasm or EIB at age 10 increases the likelihood of active asthma at age 16, but most asthma at age 16 cannot be predicted by these tests done at age 10. When applied to children without active asthma at age 10, methacholine PD20 ≤1 had a positive predictive value of only 0.26 and EIB and a positive predictive value of only 0.12. Clearly the strongest predictor of active asthma at age 16 is active asthma at age 10.
Disagreement Among Common Measures of Asthma Control in Children
Melinda M. Rathkopf

Pediatrics 2013;132;S41
DOI: 10.1542/peds.2013-2294QQQ

Updated Information & Services
including high resolution figures, can be found at:
/content/132/Supplement_1/s41.2.full.html

Permissions & Licensing
Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:
/site/misc/Permissions.xhtml

Reprints
Information about ordering reprints can be found online:
/site/misc/reprints.xhtml
Disagreement Among Common Measures of Asthma Control in Children
Melinda M. Rathkopf

Pediatrics 2013;132;S41
DOI: 10.1542/peds.2013-2294QQQ

The online version of this article, along with updated information and services, is located on the World Wide Web at:
/content/132/Supplement_1/s41.2.full.html