

# Developing, Implementing, and Evaluating a School-Centered Asthma Program: Step-Up Asthma Program

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**What is already known about this topic?** Asthma is a problem in school-aged children and contributes to poor school performance.

**What does this article add to our knowledge?** Developing a successful school-centered asthma program involves collaboration between school nurses, school administration, and local providers. This report describes a school-centered asthma program that reduced asthma morbidity and is being disseminated to additional school districts, demonstrating sustainability.

**How does this study impact current management guidelines?** The Step-Up Asthma Program applies National Asthma Education and Prevention Program-National Heart, Lung, and Blood Institute guidelines for evidence-based programs for children with asthma.

**BACKGROUND:** Asthma is a significant health problem among children: 9.3% of children in the United States suffer from asthma. Children with persistent asthma in inner cities have increased health care utilization, worse health care outcomes, increased school absences, and worse academic performance. **OBJECTIVE:** We sought to create and evaluate a school-centered asthma program to reduce asthma morbidity and create asthma-friendly schools. **METHODS:** We developed, implemented, and evaluated the Step-Up Asthma Program, a multidisciplinary school-centered asthma program. The program was designed as an outreach program with asthma counselors as a bridge between subspecialty asthma care, primary care providers, school nurses, and

children with asthma. The core components of the program involve identifying children with asthma, providing evidence-based asthma education, and case management. Students' asthma knowledge, inhaler technique, and number of asthma exacerbations were evaluated over a 2-year period (2010-2012) as a pre-post study. **RESULTS:** A total of 252 students enrolled in the Step-Up Asthma Program over a 2-year period. Significant improvements were noted in number of asthma action plans, rescue medications at school, and asthma controllers. Program participants had significant improvements in asthma knowledge scores ( $P < .001$ ) and inhaler technique ( $P < .0001$ ). There were significant reductions in *asthma exacerbations* defined as oral steroid

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*Abbreviations used**DPS- Denver Public Schools**HRA- Health Risk Assessment**KA- Kickin' Asthma**OAS- Open Airways for Schools*

**courses, urgent care visits, and missed school days ( $P < .05$ ) that persisted over time.**

**CONCLUSIONS: A guideline-based school-centered asthma program can significantly reduce asthma morbidity. The asthma counselor is the cornerstone of the program, providing asthma education and care coordination. The Step-Up Asthma Program is in its 10th year, and we believe the key elements of this program can be implemented in other school systems. © 2016 American Academy of Allergy, Asthma & Immunology (J Allergy Clin Immunol Pract 2016;■:■-■)**

**Key words:** Asthma; Schools; School nursing; Case Management

Asthma is a prevalent chronic disease that affects 9.3% of all children in the United States (6.8 million).<sup>1</sup> Asthma carries an annual cost of \$56 billion in the United States in direct costs, lost school/work, and premature deaths (185 deaths in children).<sup>2</sup> Every day, 36,000 students miss school because of their asthma.<sup>1</sup> Inner-city and minority children are more likely to have worse health care outcomes, including increased emergency department visits, hospitalizations, and death from asthma.<sup>3,4</sup> Students with persistent asthma demonstrate increased absences and worse performance on standardized testing.<sup>5</sup> The Denver Public Schools (DPS) estimated that asthma prevalence rates range between 4% and 30% (district average, 11.8%), depending on the school (Donna Shocks, MSN, RN, CNS, unpublished data, June 2012). DPS is a large urban school district with 155 schools serving 84,424 students (2012 October count). Most DPS students are from ethnic/racial minorities (58% Hispanic, 15% black) and low socioeconomic backgrounds (72% of students qualify for free or reduced lunch). Neighborhoods in Denver's inner-city have high absence rates and high hospital discharge rates correlating with high rates of uncontrolled asthma.<sup>6</sup>

The Expert Panel Report 3 from the National Asthma Education and Prevention Program-National Heart, Lung, and Blood Institute guidelines recommend evidence-based programs for children with asthma.<sup>7</sup> Because of a recognized need by DPS nursing, we developed a multidisciplinary school-centered asthma program called the Step-Up Asthma Program. We modeled the Step-Up Asthma Program on various successful programs.<sup>8-11</sup> The initial intent of the program was as a guidelines-based outreach program involving asthma subspecialists, DPS, students, parents, and primary care providers, all linked through the asthma counselors. The goals of the Step-Up Asthma Program included assessing DPS asthma prevalence, encouraging an asthma-friendly school environment, reducing asthma-related school absences, helping families find providers, and establishing systems for sustainability. The Colorado Department of Public Health and Environment provided financial support to develop a program to improve asthma control and reduce absences for children in DPS; a secondary aim was to evaluate this under the auspices of an institutional review

board. We hypothesized that implementation of the Step-Up Asthma Program in DPS would improve asthma control, decrease asthma exacerbations, and improve asthma knowledge.

## METHODS

We collaborated with DPS to form an asthma partnership eventually known as the Step-Up Asthma Program, and this program was evaluated as a preintervention and postintervention study. The Step-Up Asthma Program was reviewed and approved by the National Jewish Health Institutional Review Board, the Colorado Multiple Institutional Review Board, and the DPS Student Health and Research Committee. Parents gave informed consent to participate in the program at the time of enrollment.

### Program development

We formed a partnership with DPS nursing leadership who assigned a school nurse liaison as the link between DPS and the Step-Up Asthma Program team. In 2006-2007, we performed a survey of school nurses to better understand asthma needs in the schools. A pilot program was introduced for the academic year 2007-2008, followed by a trial of Open Airways for Schools (OAS) in 2008-2009. The Step-Up Asthma Program was piloted in 3 schools in 2009. The subsequent analyses include students enrolled in the Step-Up Asthma Program during the 2010-2011 or 2011-2012 school years and who were followed through the end of the 2011-2012 school year. The Step-Up Asthma Program is a comprehensive, school-centered, care coordination, and asthma educational program for elementary and middle-school age children (Figure 1). The Step-Up Asthma Program uses lay individuals (asthma counselors) trained to provide asthma education and implement care coordination based on the Inner-City Asthma Model of asthma counselors.<sup>8</sup> The program has 7 primary components: (1) case identification; (2) asthma risk and control assessment using validated instruments (Health Risk Assessment [HRA]; and asthma control tests) with feedback to families and health care providers; (3) care coordination engaging the student, family, school nurse, and health care provider; (4) asthma self-management skills training; (5) evidence-based asthma educational curriculum: OAS and Kickin' Asthma (KA); (6) asthma education and skills training for school nurses and ancillary staff; and (7) a safety net (provision of controller medication) for children needing services while medical homes are established.

The core staff during this time period included 3 asthma counselors from the Denver community, modeled after the National Cooperative Inner-City Asthma Study.<sup>8</sup> The asthma counselors received extensive asthma education and management training, including the American Lung Association's OAS and Colorado Asthma Coalition's Reach the Peak asthma educator course. Each asthma counselor provided care coordination and education at 5 schools, covering 75 to 100 children. A medical advisory committee composed of asthma specialists and community pediatricians provided medical oversight.

### Enrollment

School selection was based on socioeconomic need (percentage of students receiving free and reduced lunch), asthma prevalence, and percentage of minority students. We recruited students at school events such as registration and asthma and back-to-school nights and through flyers, letters from school nurses, and direct referral. Students with asthma were identified via parent/guardian report and subsequently screened with an HRA survey and a permission to contact form. We used a customized HRA, a

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