



Building school health partnerships to improve pediatric asthma care: the School-based Asthma Management Program

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Purpose of review

Children with asthma require care that is seamlessly coordinated so that asthma symptoms are recognized and managed at home and at school. The purpose of this review is to discuss recent consensus recommendations in school-based asthma care.

Recent findings

The School-based Asthma Management Program (SAMPRO) provides a widely endorsed framework to coordinate care with schools and consists of four components: establishing a circle of support around the child with asthma; facilitating bidirectional communication between clinicians and schools; comprehensive asthma education for schools; and assessment and remediation of environmental asthma triggers at school. SAMPRO standardizes recommendations for school-based asthma care coordination and provides a toolkit with websites and resources useful for the care of children with asthma in the school setting.

Summary

The review will discuss the need for coordinated school asthma partnerships, the inception and development of SAMPRO, and its vision to improve pediatric asthma care coordination within the circle of support, comprising clinicians, school nurses, families, and communities.

Keywords

asthma action plans, care coordination, school health

INTRODUCTION

Asthma is a leading chronic health condition in children, affecting 8.6% of children in the United States [1[•]]. Childhood asthma is associated with significant morbidity and high rates of school absenteeism, particularly in children of low socioeconomic status. Reducing the disparity between children with asthma and healthy children will require building effective health partnerships among patients, families, primary care providers, specialists, and schools [2[•]]. These partnerships can shape a circle of support (Fig. 1) around the child with asthma [3^{••}].

School nurses, when empowered with asthma action plans (AAPs) and relevant clinical health information, can improve the delivery of asthma care and reduce the risk of asthma exacerbations [4]. In turn, school nurses can provide clinicians useful information regarding triggers and barriers that can impact asthma management. Despite this evidence,

rates of completion of AAPs by providers are often low, few AAPs reach school nurses, and the methods of AAP transmission to schools are inconsistent [5–7]. Subsequently, children with asthma lack the coordination of care required to avoid exacerbations, achieve optimal asthma control, and attain success in school [7].

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KEY POINTS

- The SAMPRO supports the use of school health partnerships to improve pediatric asthma care coordination.
- SAMPRO advocates for the formation of a circle of support around the child with asthma comprising clinicians, families, school nurses, and the community.
- SAMPRO supports the transmission of AAPs with schools, bidirectional communication between clinicians and school nurses, comprehensive asthma education, and the reduction of environmental asthma triggers at school

Schools can be powerful institutions to affect behavioral change in children with asthma [8]. The positive impact of school nurses on chronic disease management is well known and has been associated with significant improvements in immunization rates, vision screening, and reduced school absences for asthma [2⁹]. For the nearly 50 million children who attend public schools, school nurses can provide important community-based healthcare, but are often not included in collaborative health partnerships [10].

School nurses who are on the front line of school-based asthma management strongly

benefit when clinicians create individualized AAPs, share the AAPs with families, and reliably deliver AAPs to schools [2⁸]. Recently published studies employing strong school-centered asthma programs have improved the delivery of AAPs to schools, increased access to asthma medications, and reduced pediatric asthma exacerbations [11⁹].

BACKGROUND

This evidence has prompted national experts to call for comprehensive policies to collaborate with schools to reduce the pediatric asthma burden [12,13⁹,14]. Recently, the American Academy of Allergy, Asthma and Immunology (AAAAI), in collaboration with the National Association of School Nurses (NASN), developed a national School-based Asthma Management Program (SAMPRO) published in the September issue of the *Journal of Allergy and Clinical Immunology* [3⁹]. In particular, SAMPRO advocates for a circle of support, a coordinated model for communication among patients, families, clinicians, and school nurses using asthma management plans (AMPs) to provide emergency and individualized asthma care in schools. AMP consists of a generic asthma emergency plan (AEP) and individualized AAPs that outline baseline and step-up care for asthma patients. AMPs are a core component of

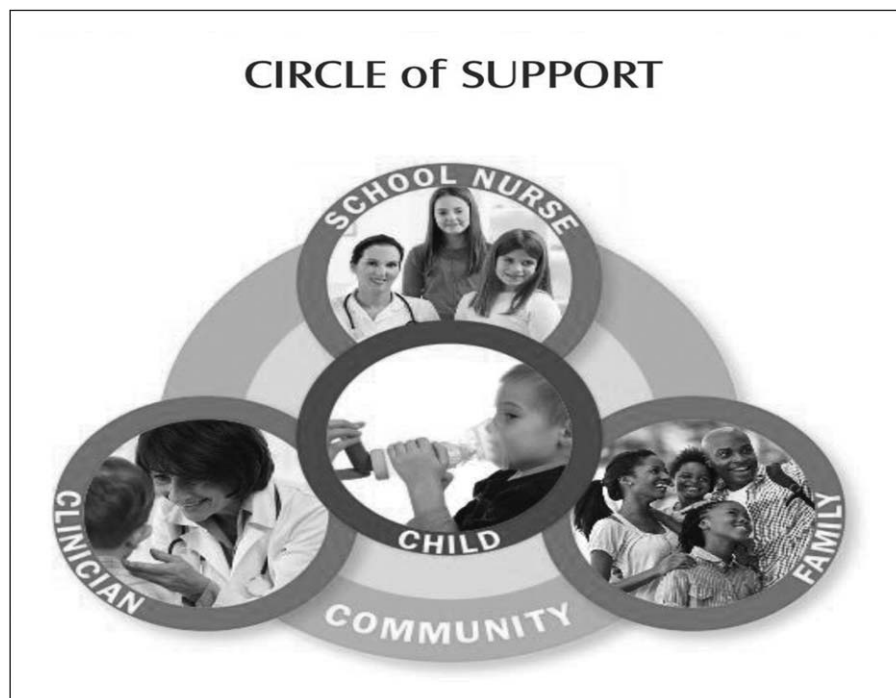


FIGURE 1. The SAMPRO circle of support comprises the clinician, school nurse, and family and is centered around the child with asthma (previously published in: [3⁹]).

SAMPRO and a standardized AEP and a newly developed SAMPRO AAP can be found within the SAMPRO initiative.

The SAMPRO workforce, consisting of members with diverse experiences in school health and pediatric asthma, convened in October 2015 to address gaps in asthma care coordination that exist among families, clinicians, and schools. Key to the development of the workforce was the inclusion of primary care physicians, specialists, researchers, policy makers, patient advocates, and informationists within an open forum to promote solutions in pediatric asthma care. The workforce was divided into three groups to address the flow of information through the circle of support. The first group addressed the process of developing and sending a standardized AAP to schools that focused on the key elements needed to coordinate asthma care with school nurses. The second group consisted of two arms: one arm provided recommendations for receiving and promoting use of the AAP by school nurses and the other arm constructed recommendations for improving asthma education for all school staff. Similarly, the third group was subdivided into two sections with the first section evaluating the need for broad recommendations for the control of asthma triggers in the school environment and a second section that outlined a dissemination and implementation plan for SAMPRO. Importantly, each of these three groups included key stakeholders whose diverse backgrounds and collaboration led to the widespread endorsement of SAMPRO.

THE SCHOOL-BASED ASTHMA MANAGEMENT PROGRAM: ESSENTIAL COMPONENTS

SAMPRO outlines four key components for successful coordination of pediatric asthma care among families, clinicians, and school nurses centered around the child with asthma (Table 1) [3²²]. The crux of the program lies in the strong establishment of component one, the circle of support, upon which a communication and care coordination infrastructure may be built. Building the circle of support involves several key steps including: establishing relationships among the child with asthma and their families with clinicians and school nurses; ensuring that clinicians develop AAPs as well as provide asthma education, medications, and resources to families at the preschool asthma visit; empowering school nurses and families to manage asthma symptoms at school as guided by the AAP and to promote educating school personnel regarding asthma monitoring; maintaining open lines of communication among all members of the circle of support. Checklists for each member within the circle of support have been published in the SAMPRO whitepaper and are available for download from the SAMPRO toolkit [3²²].

Component two advocates for bidirectional communication between clinicians and schools, including the use of AMPs, which includes the AEP and an AAP for use at home and at school. The Asthma Emergency Treatment Plan outlines an emergency management plan for all students with asthma and supports the stocking of albuterol at

Table 1. The School-based Asthma Management Program consists of four key components (previously published in: [3²²])

Components	Description
1) Development and implementation of a circle of support that facilitates communication among clinicians, school nurses, families, and the community	A communication network integrating the child, their family, the healthcare provider, and the school nurse into the asthma care team
2) Implement AMPs. The AMP includes the AEP for emergency management of asthma symptoms, including stock albuterol where state law allows and a way to deliver the medication. Each individual student should have an AAP for home and school with medical authorization for self-carry and administration of asthma medications, along with parental release of information	A 'generic' asthma emergency treatment plan to address children experiencing an asthma exacerbation, when to use rescue medication, how much rescue medication to administer, and when to call 911. An AAP includes individualized instructions for the student's asthma management plan and instructions on when to step-up asthma care
3) A comprehensive asthma educational plan for all school personnel	A plan for school personnel regarding what is asthma, how to recognize and respond to an asthma exacerbation
4) Assessment and remediation of school-based asthma triggers	A plan to assess the school environment and respond to asthma triggers

AAP, asthma action plan; AEP, asthma emergency treatment plan; AMP, asthma management plan.

AAAAI American Academy of Allergy Asthma & Immunology
www.aaaai.org

Asthma Action Plan for Home & School

Name: _____ Birthdate: _____

Asthma Severity: ☐ Intermittent ☐ Mild Persistent ☐ Moderate Persistent ☐ Severe Persistent
☐ He/she has had many or severe asthma attacks/exacerbations

Green Zone Have the child take ALL of these medicines EVERYDAY, even when the child feels well.

Always use a spacer with inhalers as directed.

Controller Medicine(s): _____

Controller Medicine(s) Given in School: _____

Exercise and Asthma Trigger Medicine(s): _____ puffs 15 minutes before activity
☐ Use Albuterol/Levalbuterol This should be used: ☐ with all activity ☐ when the child feels he/she needs it

Yellow Zone Begin the sick treatment plan if the child has a cough, wheeze, shortness of breath, or tight chest. Have the child take all of these medicines when sick.

Rescue Medicine(s): _____
☐ Albuterol/Levalbuterol _____ every 4 hours as needed

Controller Medicine(s): _____
☐ Continue Green Zone medications ☐ Add _____
☐ Change to _____

If the child is in the **YELLOW** zone more than **24** hours or is getting worse, follow **RED ZONE** and call the doctor right away!

Red Zone If breathing is hard and fast, ribs sticking out, trouble walking, talking, or sleeping.
Get Help Now

Take rescue medicine(s) NOW
☐ Albuterol/Levalbuterol _____ every _____

If the child is not better right away, call 911
Please call the doctor any time the child is in the red zone.

Asthma Triggers: (List) _____

School Staff: Follow the Yellow and Red Zone plans for rescue medications according to asthma symptoms. Unless otherwise noted, the only controllers to be administered in school are those listed as "given in school" in the green zone.
☐ Both the asthma provider and the parent feel that the child may carry and self-administer their inhalers
☐ School nurse agrees with student self-administering the inhalers

Asthma Provider Printed Name and Contact Information: _____ Asthma Provider Signature: _____
Date: _____ Date: _____

Parent/Guardian: I give written authorization for the medications listed in the action plan to be administered in school by the nurse or other school members as appropriate. I consent to communication between the prescribing health care provider/clinic, the school nurse, the school medical advisor and school-based health clinic providers necessary for asthma management and administration of this medication.

Parent/guardian signature: _____ School Nurse Reviewed: _____
Date: _____ Date: _____

Please send a signed copy back to the provider listed above.

FIGURE 2. The SAMPRO AAP facilitates asthma care coordination among clinicians, families, and school nurses (previously published in: [3²²]). AAP, asthma action plan.

schools and has been previously published [15]. In addition, SAMPRO developed a standardized AAP (Fig. 2) that incorporates the traditional stoplight algorithm with key features that facilitate the use of the AAP in schools [3²²]. These key features include: asthma severity, asthma exacerbation risk, asthma triggers, clear communication about medications to be administered at school (including the need for preexercise albuterol), clinician contact information, and parental release of information and authorization to self-carry and administer asthma medications in school and on activities. In addition, the SAMPRO AAP also includes a section for the nurse to acknowledge receipt of the plan to promote school processing of the AAP and to complete the circle of support.

For individuals and organizations that have implemented use of their own AAP, a supplementary school treatment order form is available in the SAMPRO toolkit that emphasizes the key

features in a separate form to supplement any AAP [3²²]. In addition, authorizations regarding administering medications, whether a child can self-administer or self-carry medications and release of information are included within the AAP and the school supplementary treatment form to facilitate the management of asthma medications by school nurses and, when appropriate, by students.

It is important to recognize that the school nurse is a key member of the healthcare team that manages a child's asthma in the school setting. Both clinicians and school nurses need to exchange protected health information in accordance with Health Insurance Portability and Accountability Act and Family Educational Rights and Privacy Act privacy laws and these needs have been addressed with the SAMPRO AAP. In addition, the SAMPRO workforce strongly recommends faxing, the use of secure web portals, or electronically transmitting the AAP directly from the clinician to the

school nurse to facilitate reliable health information exchange between healthcare providers.

Implementation of the AAP in school requires that the school nurse receives and processes the forms securely and in a timely manner. SAMPRO, therefore, promotes a system where school-based AMPs (AEP and individualized AAPs) and periodic updates of the child’s asthma status, including hospitalizations and ER visits, be transmitted directly from the healthcare provider to the school nurse. With this framework, the circle of support becomes a living partnership between school nurses and clinicians who collaborate to provide asthma care coordination, to develop a school-based case management plan and to recruit the use of community and school health resources such as school-based health clinics. This improved care coordination will in turn improve the knowledge and self-efficacy of students and school staff in the management and treatment of asthma in schools.

Component three involves the development of a comprehensive education plan for schools on the recognition of asthma symptoms and best practices in managing asthma in the school setting. The school nurse has a key role in the implementation of SAMPRO within schools and in this role serves as a healthcare provider for the child with asthma and also as an educator for other school personnel, including administrators, teachers, and janitors. Furthermore, the school nurses can promote the use of formal education programs and asthma care coordination programs such as the Building Bridges Program, Easy Breathing, the American Lung Association’s Open Airways for Schools, Kickin’ Asthma, Iggy and the Inhalers, and Fight Asthma Now to improve self-efficacy and knowledge of asthma management and understanding by students and school staff [11[■],15–19]. In this way, the school nurse serves as a school health advocate for children with asthma and an integral member of the asthma care team that manages a child’s asthma symptoms in school as guided by AMPs. Links to online resources and educational programs are available in the SAMPRO toolkit.

Component four advocates for the reduction of asthma triggers within the school environment. Poor indoor air quality has been shown to have a negative effect on health and well-being [20[■]]. Furthermore, many schools do not use recommended indoor air quality management programs to reduce environmental triggers, such as common allergens and diesel exhaust, or to control exposure to pests such as rodents and mice [21[■]]. Given that these exposures can trigger a child’s asthma while in school, it is critical that we support practices that reduce these risks and promote healthy school

environments. SAMPRO strongly recommends that school nurses work with administrators and other school personnel to develop an Indoor Air Quality (IAQ) management program, as published by the Environmental Protection Agency (EPA) [20[■]]. The EPA provides protocols and the School IAQ assessment mobile app that helps school staff to recognize, address, and provide an individualized remediation program to rectify indoor air quality problems that can exacerbate asthma in school. A checklist for assessing the school environment and indoor quality is available in the SAMPRO toolkit and whitepaper [15]. Further information can be found at <http://www.epa.gov/iaq/schools>.

THE FUTURE OF SCHOOL-BASED ASTHMA MANAGEMENT PROGRAM: DISEMINATION AND IMPLEMENTATION

SAMPRO has received widespread support and endorsement from physician organizations and medical advocacy groups (Table 2). However, its use will require widespread dissemination of the SAMPRO program, with a focus on implementing the program in its entirety. To promote the use of the program, the SAMPRO workforce and the AAAAI have committed resources to develop comprehensive recommendations in its whitepaper and the development of the SAMPRO toolkit (available at <http://www.aaaai.org/SAMPRO>) to establish program efficacy. The SAMPRO whitepaper and toolkit SAMPRO are designed to support programs that have limited resources and not to replace established school-based asthma programs that have already demonstrated efficacy within their communities.

The SAMPRO toolkit was constructed in collaboration with the University of Wisconsin Health Innovations Program, University of Wisconsin (HIPxChange) program that enables the SAMPRO workforce to track use of the toolkit nationwide. This toolkit contains additional educational resources, online learning, and downloadable electronic

Table 2. Organizations that have endorsed the School-based Asthma Management Program

Allergy & Asthma Network (AAN)
American Academy of Pediatrics (AAP)
Asthma and Allergy Foundation of America (AAFA)
American College of Allergy, Asthma & Immunology (ACAAI)
American Thoracic Society (ATS)
National Association of School Nurses (NASN)
National Association of Pediatric Nurse Practitioners (NAPNP)

forms of the AEP, the AAP, and the supplementary school treatment form in English and Spanish. This toolkit is a powerful adjunct to the whitepaper in that it provides users with tangible tools for dissemination, including slide sets with and without narration, videos to teach inhaler techniques, and links to educational and other online tools developed outside the SAMPRO workforce. Registration to download the full toolkit is free and information gathered is used for the sole purpose of tracking use and dissemination of SAMPRO.

In parallel to the development of the whitepaper and toolkit, AAAAI lobbyists worked with national legislators to draft a congressional bill (<https://www.congress.gov/bill/114th-congress/house-bill/4662/text>) to support funding for SAMPRO. It is important to recognize that sustainability of SAMPRO will depend upon schools having adequate funding to maintain funding for school health, stocking of asthma medications, and training of school personnel on asthma management. Specifically, the AAAAI established the Office of School-based Management for Asthma and will continue to collaborate with National Association of School Nurses and its partners who have endorsed the program to jointly support state and federal policy makers' recommendations for implementing SAMPRO.

Future efforts will focus on working with our partners to develop a system for standardized data collection and reports to assess health and educational outcomes nationwide. We will actively disseminate the program through the use of webinars, continuing medication education and maintenance of certification activities, and support for partnerships through the country that actively implement SAMPRO. In addition, individuals can access further content at the SAMPRO website and can contribute resources to the toolkit and website by sending emails to the SAMPRO workforce at sampro@aaaai.org.

CONCLUSION

SAMPRO is a widely endorsed school health program that promotes an integrated approach to coordinating pediatric asthma care among clinicians, families, and school nurses. We strongly support clinicians and school nurses to work within their individual communities to establish strong circles of support that will serve as the bedrock to implement all four components of SAMPRO. Developing these frameworks and partnerships will not only improve pediatric asthma care but may also serve as a model for the coordination of other chronic pediatric health conditions.

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Conflicts of interest

There are no conflicts of interest.

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Papers of particular interest, published within the annual period of review, have been highlighted as:

- of special interest
- of outstanding interest

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