

Strategies for Addressing Asthma in Schools



National Center for Environmental Health
Division of Environmental Hazards and Health Effects



Contents

Introduction.....	1
Comprehensive Asthma Control Services	1
School Health.....	2
Asthma Management in Schools.....	3
Providing Asthma Education	3
Linking Students to Medical Care.....	4
Improving Indoor Air Quality in Schools.....	5
Policies Supporting Asthma Management in Schools.....	7
References.....	9
Resources.....	11



**Strategies for Addressing
Asthma in Schools**

Introduction

It is possible to live well with asthma. With appropriate care, including medical management and strategies to reduce environmental asthma triggers, students with asthma can control their symptoms so that the condition does not interfere with their educational activities. CDC's National Asthma Control Program (NACP) works with state health departments, nonprofits, and many others to ensure that a comprehensive array of asthma services is available, and that people with asthma are able to access the services they need.

Schools are one setting in which many asthma control services can be provided. For example, school nurses can help students use their medications correctly and can refer students to medical care. Other school personnel have roles in ensuring that students receive emergency care when needed;

school staff can also take steps to improve the school environment so that students, as well as faculty and staff, are not exposed to harmful substances that can trigger their asthma symptoms.

Strategies for Addressing Asthma in Schools provides a compilation of information and resources for implementing programs in schools. It was designed for staff in state health departments as they manage their asthma programs, but other individuals and groups with an interest in "asthma friendly schools" may also find it useful. None of the resources or programs included here are "one size fits all." Every program should be tailored to the community's context and culture and then evaluated to ensure that it is relevant, effective, and reaching the students experiencing the highest burden of asthma.

Comprehensive Asthma Control Services

The most recent guidelines for providing high-quality asthma care, the National Asthma Education and Prevention Program's Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma (NAEPP EPR-3), call for people with asthma to receive the correct diagnosis, assessment, and medication in the clinical setting; education for a partnership in care with their medical providers; and education or services to reduce exposure to environmental triggers. environmental triggers (1). People have varying needs for their asthma care. A continuum of healthcare and public health services, with providers who are connected with effective referral processes, helps ensure the optimal mix of asthma service.

The NACP funds state asthma programs through the cooperative agreement CDC-RFA-EH14-1404, "Comprehensive Asthma Control through Evidence-based Strategies and Public Health – Health Care Collaboration," to broaden the accessibility of comprehensive asthma control services. State asthma programs work with a variety of organizations to provide services that:

1. Teach people with asthma how to manage their condition through "intensive asthma self-management education."
2. Ensure that people with asthma are connected to providers who can provide medical management that adheres to the NAEPP EPR-3 guidelines.
3. Teach caregivers such as family members, school staff, and home visitors about appropriate asthma management.
4. Provide information about evidence-based policies supportive of asthma control to people concerned about asthma, for example, informing them about the importance of good indoor air quality and the reduction of asthma triggers in places where people with asthma live, work, and play.

State asthma programs also partner with community organizations, health care providers, and health systems to improve the quality of asthma care, increase system-level linkages, and expand insurance coverage for effective services so that, in time, a truly comprehensive array of asthma control services is available in every community in the state.

School Health

To encourage a comprehensive approach to school health, CDC developed the Coordinated School Health (CSH) model in 1987. In 2012, CDC and the Association of Supervision and Curriculum Development began to explore ways to more fully engage both the education and health sectors to improve student health. They created the “Whole School, Whole Community, Whole Child (WSCC)” model, which incorporates the components of a Coordinated School Health program around the tenets of the Whole Child Framework to create a comprehensive approach to health and learning.

The model is youth-centered and is meant to coordinate policies, processes, and practice in many arenas so that additional efforts and resources are

focused on improving learning and health. This holistic approach ensures that each student is healthy, safe, engaged, supported, and challenged. Community involvement is included as a component to encourage engagement, and as a final layer around the entire model emphasizing the key linkage between schools and communities. The WSCC model does not replace the Coordinated School Health model, but rather expands on it and builds on the lessons learned through its implementation. For more detailed information on the WSCC model, see <http://www.cdc.gov/healthyschools/wsc/index.htm>; to visit a virtual healthy school based on WSCC, see <http://www.cdc.gov/healthyschools/vhs/index.html>.

Figure 1: Whole School, Whole Community, Whole Child Model



Asthma Management in Schools

The NAEPP EPR-3 Guidelines summarize the evidence that comprehensive school-based educational interventions can be effective in improving the health and quality of life for students with asthma. The report cites a study that found that providing education for elementary school children, plus educational components for principals, custodians, and other school staff resulted in reduced asthma illness, improved asthma management, and decreased school absences (2).

While other studies of school-based education showed no significant effect on student health or school staff efforts to communicate with community physicians about students' symptoms, based on the evidence overall, the Expert Panel made the following recommendation: "...implementation of school-based asthma education programs proven to be effective [should] be considered to provide to as many children who have asthma as possible the opportunity to learn asthma self-management skills and to help provide an "asthma-friendly" learning environment for students who have asthma (Evidence B)" (1,3,4,5).

The WSCC model promotes an integrative approach to the health and well-being of children, emphasizing a school-wide approach rather than one that is designed for a particular health condition. To complement this overall focus, asthma-specific guidance is available from CDC's Healthy Schools Program. These resources build on the Coordinated School Health model, offering the following six strategies to promote the adoption of asthma-friendly policies and activities:

1. Establish management and support systems for asthma-friendly schools.
2. Provide appropriate school health and mental health services for students with asthma.
3. Provide asthma education and awareness programs for students and school staff.
4. Provide a safe and healthy school environment to reduce asthma triggers.
5. Provide safe, enjoyable physical education and activity opportunities for students with asthma.

6. Coordinate school, family, and community efforts to better manage asthma symptoms and reduce school absences among students with asthma.

The Healthy Schools Program has a number of resources on its website, including a toolkit with suggestions on how to help others understand the importance of asthma-friendly schools and additional details about implementing each of the six strategies. For more information, see <http://www.cdc.gov/healthyschools/asthma/strategies.htm>. For another toolkit, see the American Lung Association's Asthma-Friendly Schools Initiative (AFSI). The AFSI Toolkit includes downloadable template policies and information and is available at <http://www.lung.org/lung-health-and-diseases/lung-disease-lookup/asthma/asthma-education-advocacy/asthma-friendly-schools-initiative/afsi-toolkit.html>.

In addition to these resources, the NACP has compiled information on providing asthma education, connecting students with medical care, and improving indoor air quality. For any of these resources to be useful, however, school staff, families of students with asthma, and health care providers must take the time to build trust and maintain the collaborative relationships necessary for comprehensive, effective asthma care.

Providing Asthma Education

Students with asthma are best equipped to handle their asthma when they receive education on asthma basics, asthma management, and how to recognize and respond in an asthma emergency (6). It may be helpful for parents to participate in educational programs. Education can be delivered by a school nurse, a certified asthma educator (AE-C), a respiratory therapist, or other qualified provider. The EPR-3 guidelines advise that this education should be tailored to the context of the school and the specific needs of the children with asthma (1). The NACP has provided detailed descriptions of a number of asthma self-management programs in its document *Asthma Self-Management Education: A Compilation of Selected Resources*. These programs can be tailored to many situations and audiences.

Similarly, students with asthma benefit when school staff participate in asthma education and professional development activities on the same topics. These efforts can include classroom teachers, physical education teachers, coaches, secretaries, administrative assistants, principals, facility and maintenance staff, food service staff, and bus drivers (6).

Linking Students to Medical Care

As noted earlier, the NAEPP's expert guidelines call for students with asthma to have their asthma correctly diagnosed and treated by an appropriate medical professional. Linking students to medical care is a challenging component of improving student health. Establishing and strengthening linkages between schools and clinical care systems or providers requires flexibility, creativity, and persistence, but the current health care environment offers myriad opportunities for collaboration and innovation.

Schools can help students access a regular source of health care in a variety of ways, depending on the amount of effort, resources, and time available, as well as regulatory considerations. More active and involved activities—such as case management or making appointments for medical care—may create a higher burden on the school, but these are also more likely to be successful in linking the student to a medical home (7). The following linking activities are listed in the order from minimal to comprehensive involvement:

- Maintaining resource lists for nurses and school staff to distribute about availability and enrollment in affordable health insurance
- Providing active guidance and assistance with obtaining health insurance
- Passively referring the student to a healthcare provider
- Providing appointment reminders and follow-up to determine referral completion (8, 9)
- Making appointment with healthcare provider
- Conducting systematic follow-up for missed visits (10)
- Assisting with transportation to a healthcare provider

» Addressing other individual barriers/linking to ancillary or social services (11)

- Making a referral for case management
- Providing active care navigation or case management (12)
- Providing healthcare/co-location of medical services (for school-based or school-linked health centers)

While the number and prominence of school-based health centers (SBHC) vary by state, they can be powerful partners to engage in innovative projects to link underserved students with asthma to primary care. For more information about SBHCs, see the School-based Health Alliance, www.sbh4all.org.

Care navigation and case management activities, while effective at linking individuals to medical care, may not be feasible for many school nurses and support staff, especially in districts with high nurse-to-student ratios. In some cases, the responsibility for tracking and following up on referrals and asthma care visits could be carried by entities outside the school. Some examples of this include:

- Telehealth programs (often associated with SBHCs; good option for rural systems) (13)
- State Medicaid case managers
- Community-based care coordination teams/programs (14)
 - » Integrated partnerships with local community-based organizations (CBOs) or other agencies
- Liaisons or care navigators based in local health systems and community health centers
- Innovative public health information systems (15)

For school-based asthma programs to be successful, a number of barriers may need to be addressed. Many schools do not have health professionals on site throughout the school day. While school nurses are not the only staff who can provide some basic asthma services, the nurse-to-student ratio may be a critical factor to consider when designing any program. Due to the complex nature of asthma, it may be helpful for school nurses to have access to professional development and

continuing education activities in order to provide optimal asthma management for students.

Especially when working at a state level, it may be helpful to recognize that many states adhere to a principle of “local rule” which mandates that systems, policies, rules, and regulations related to school matters are controlled in local municipalities rather than at the state level.

Finally, school programs must take into account federal, state, local, and other policies designed to protect student and family privacy. [FERPA, the Family Educational Rights and Privacy Act](#), requires consent from a parent or eligible student to release information from any educational record, such as a health form or other record that might be used in linking students to medical care. However, school clinic records maintained separately from the school system may not necessarily be considered “part of the educational record and therefore subject to the provisions of FERPA” (15). Similarly, [HIPAA, the Health](#)

[Insurance Portability and Accountability Act](#), dictates certain measures to protect health information.

Programs can address these barriers by arranging for data- and information-sharing protocols between local healthcare providers and school nurses or school-based health centers (SBHCs) or by providing assistance with the use of electronic health records in schools. By facilitating information sharing, programs make it easier for school personnel to monitor and manage care for students with asthma and provide medical referrals if needed.

Improving Indoor Air Quality in Schools

Poor air quality inside the school can trigger asthma symptoms for many students. A number of free and low-cost resources are available to help improve indoor air quality, which benefits students with asthma as well as school staff with asthma. The following table lists some of the most useful tools.



Table 1: School-based Indoor Air Quality Tools

Policy/Tool	Policy/Tool Description	Elements	Notes
USEPA's Tools for Schools http://www.epa.gov/iaq/schools/	Develop and sustain effective and comprehensive IAQ management programs, or other overall health and safety initiatives	Focus areas: <ul style="list-style-type: none"> • Provides programmatic strategies to develop program • Provides technical solutions to manage risk: <ul style="list-style-type: none"> • Moisture and mold • Integrated Pest Management (IPM) • Cleaning and maintenance • Materials selection • Source control • HVAC 	<ul style="list-style-type: none"> • Voluntary • Any school can adopt • Most states that have an IAQ program use Tools for Schools as their framework
USEPA School Flag Program https://airnow.gov/index.cfm?action=flag_program.index	Provide a mechanism to alert schools to the local air quality forecast and help them to take actions to protect students' health, especially those with asthma	<ul style="list-style-type: none"> • Flags and handbook provided to participating schools. • Additional educational materials on AQ and children's health provided on website to teachers. 	APRHB collaborated with EPA to enhance the asthma-related language.
USEPA Clean School Bus National Idle Reduction Campaign http://www.epa.gov/cleanschoolbus/antiidling.htm	Provide guidance and materials on ways a school district or school can become involved in idle reduction.	<ul style="list-style-type: none"> • Encourages idle reduction to protect the health of children, bus drivers and the community, as well as to improve air quality. • Promotes idle reduction as a simple way to save money by saving fuel and reducing wear and tear on engines. • Recognizes the positive contributions being made by school bus drivers. • Provides materials to help school districts, transportation managers, bus drivers, teachers, parents, and students learn about air quality and diesel emissions. 	<ul style="list-style-type: none"> • Provides sample idling policy that can be used as a template • Provides materials that can be used to help tailor a policy in the school or school district
Strategy 3: Provide a Healthy Learning Environment, as part of the Asthma Friendly Schools Initiative http://www.lung.org/assets/documents/asthma/maintain-healthy-indoor-air.pdf	<ul style="list-style-type: none"> • Part of larger Asthma Friendly Schools initiative • 4 key elements (please see next column) 	<ul style="list-style-type: none"> • Proactively maintain healthy Indoor Air Quality (IAQ) • Assure comprehensive tobacco-free buildings and grounds • Use integrated pest management (IPM) techniques to control pests • Manage student exposure on high outdoor air pollution 	Each element encapsulates several rules/policies: e.g., IAQ→bus idling, Tools for Schools.
ALA Healthy Air Walkthrough: Classroom List http://www.lung.org/assets/documents/asthma/healthy-air-classroom.pdf	Checklist to help identify potential triggers in the classroom	Checklist items to assess for following factors: <ul style="list-style-type: none"> • Cleanliness (e.g., mold, dust mites, food) • Fragrance • Exposure to classroom allergens (e.g., class pet, peanut allergen) • Availability of fresh air 	

Continued

Policy/Tool	Policy/Tool Description	Elements	Notes
<p>State policies advocating for use of green cleaning practices in schools:</p> <p>http://www.eli.org/buildings/green-cleaning-schools</p>	<ul style="list-style-type: none"> • Policies from 10 states and the District of Columbia that have been adopted in recent years with the goal of advancing green cleaning practices in schools and reducing exposure to chemicals. • NY, IL, ME, MO, CT, MD, NV, HI, IA, DC, VT 	<ul style="list-style-type: none"> • Policies vary from state to state. • Most laws require schools to use green cleaning products. • Criteria differ in how this requirement 	
<p>State health laws that require school inspections</p> <p>http://www.eli.org/research-report/school-indoor-air-quality-policy-strategies-maintaining-healthy-learning-environment</p>	<ul style="list-style-type: none"> • Incorporated policies to ensure compliance with state health sanitation/ safety criteria • Laws vary in terms of frequency, scope, and content of inspections. • States that have specific language include: OH, WA, VT, UT, PA, NV, NC, SC, KY, IN. • Local health agency is the inspection authority 	<ul style="list-style-type: none"> • Varies from state to state (please see Chapter 2 for a description of WA and OH programs) • Some laws are punitive in nature 	

Policies Supporting Asthma Management in Schools

The strategies described here can effectively support a safe and healthy learning environment for students with asthma when backed by school policies. Comprehensive asthma-related school-based policies may include the following core strategies:

1. A policy ensuring a smoke-free environment for all school activities. (16,17)
2. A written carry and self-administer quick-relief medication policy that allows safe, reliable and immediate access to medications whenever possible. (6)

Policy Considerations

- a. All 50 states and the District of Columbia have passed a law allowing students to carry and use inhalers at school. ALA has tools that address some of the barriers to implementing these laws: <http://www.lung.org/lung-health-and-diseases/lung-disease-lookup/asthma/living-with-asthma/creating-asthma-friendly-environments/asthma-medication-in-schools.html>
- b. In the event a student does not have access to personal medication during an asthma episode, schools

should maintain stock medicine. [See ALA's model Stock Bronchodilator Policy for Students with Asthma.](#)

- c. It is important to assess a child's readiness to self-carry. See ALA's [Student Readiness Assessment Tool.](#)
3. A policy requiring or strongly encouraging individualized Asthma Action Plans for all students with asthma to monitor and manage symptoms and reduce exposure to potential asthma triggers. (18,19,20,21)
Policy Considerations
 - a. Use Asthma Action Plans that serve not just as the student's medical treatment plan, but when signed by the healthcare provider and parent, is also an authorization form, thus eliminating the need for schools to collect and track multiple forms.
 4. A school-wide emergency plan for handling asthma episodes. (6,22)
Policy Considerations
 - a. Establish a policy or procedure to handle field trips, including a designated

faculty or staff member with a copy of the asthma action plan. (23)

- b. Caregiver must understand the asthma action plan, know what to do in case of an emergency, and be able to administer medications, if needed. (23,24,25)

- 5.** A policy requiring or strongly encouraging asthma education for all school personnel (especially health service professionals, teachers, physical education teachers, and coaches). (6,18,22)

Policy Considerations

- a. School staff need education on basic asthma, asthma management, and should be prepared to handle an asthma or breathing emergency. (21)

- 6.** A policy and mechanism to ensure access to self-management education and case management for students whose asthma is not well controlled. (1,18,22,23)

Policy Considerations

- a. Recent evidence indicates that asthma self-management education is effective in improving outcomes of chronic asthma. (1)
- b. Self-management education can reinforce the knowledge, attitudes, and skills to control student's asthma. (21)

- 7.** School-based air quality policies to help reduce asthma-related triggers.

For support in prioritizing, adopting, implementing school policies, see [The Enhancing School Health Services through Training, Education, Assistance, Mentorship, and Support \(TEAMS\) project from American Academy of Pediatrics](#). This interactive resource helps school districts engage in a systematic, planned process to improve their health services.



References

1. National Institutes of Health Expert Panel Report 3 (EPR 3). Guidelines for the Diagnosis and Management of Asthma. Publication No. 08-5846, July 2007. Available from: <http://www.nhlbi.nih.gov/health-pro/guidelines/current/asthma-guidelines/full-report.htm>. Accessed: 2014 September 5.
2. Clark NM, Brown R, Joseph CL, Anderson EW, Liu M, Valerio MA. Effects of a comprehensive school-based asthma program on symptoms, parent management, grades, and absenteeism. *Chest*. 2004;125(5):1674–9. [PubMed: 15136375]
3. Patterson, E., Brennan, M., Linskey, K., Webb, D., Shields, M., & Patterson, C. (2005). A cluster randomised intervention trial of asthma clubs to improve quality of life in primary school children: the School Care and Asthma Management Project (SCAMP). *Archives of Disease in Childhood*, 90(8), 786–791.
4. Velsor-Friedrich, B., Pigott, T., & Srof, B. (2005). A practitioner-based asthma intervention program with African American inner-city school children. *Journal of Pediatric Health Care*, 19(3), 163-171.
5. Halterman, J. S., McConnochie, K. M., Conn, K. M., Yoos, H. L., Callahan, P. M., Neely, T. L., & Szilagyi, P. G. (2005). A randomized trial of primary care provider prompting to enhance preventive asthma therapy. *Archives of pediatrics & adolescent medicine*, 159(5), 422-427.
6. National Asthma Education and Prevention Program. Managing Asthma: A Guide for Schools, 2003. Available from: http://www.nhlbi.nih.gov/files/docs/resources/lung/asth_sch.pdf. Accessed: 2014 September 4.
7. Liao, A., Crepaz, N., Lyles, C. M., Higa, D. H., Mullins, M. M., DeLuca, J., ... & Marks, G. (2013). Interventions to promote linkage to and utilization of HIV medical care among HIV-diagnosed persons: a qualitative systematic review, 1996–2011. *AIDS and Behavior*, 17(6), 1941–1962.
8. Brennan, A., Browne, J. P., & Horgan, M. (2014). A systematic review of health service interventions to improve linkage with or retention in HIV care. *AIDS care*, 26(7), 804-812.
9. Hacker, K. A., Weintraub, T. A., Fried, L. E., & Ashba, J. (1997). Role of school-based health centers in referral completion. *Journal of Adolescent Health*, 21(5), 328-334.
10. Aziz, M., & Smith, K. Y. (2011). Challenges and successes in linking HIV-infected women to care in the United States. *Clinical Infectious Diseases*, 52(suppl 2), S231-S237.
11. Zaller, N. D., Fu, J. J., Nunn, A., & Beckwith, C. G. (2011). Linkage to care for HIV-infected heterosexual men in the United States. *Clinical Infectious Diseases*, 52(suppl 2), S223-S230.
12. Griswold, K. S., Homish, G. G., Pastore, P. A., & Leonard, K. E. (2010). A randomized trial: are care navigators effective in connecting patients to primary care after psychiatric crisis?. *Community mental health journal*, 46(4), 398-402.
13. Young, T. L., & Ireson, C. (2003). Effectiveness of school-based telehealth care in urban and rural elementary schools. *Pediatrics*, 112(5), 1088-1094.
14. Findley, S., Rosenthal, M., Bryant-Stephens, T., Damitz, M., Lara, M., Mansfield, C., ... & Viswanathan, M. (2011). Community-Based Care Coordination Practical Applications for Childhood Asthma. *Health promotion practice*, 12(6 suppl 1), 52S-62S.
15. Hinman, A. R., & Davidson, A. J. (2009). Linking children's health information systems: clinical care, public health, emergency medical systems, and schools. *Pediatrics*, 123(Supplement 2), S67-S73.
16. Centers for Disease Control and Prevention. Guidelines for school health programs to prevent tobacco use and addiction. *MMWR* 1994; 43(RR-4):1-10.
17. National Asthma Education and Prevention Program. NAEPP Resolution on Asthma Management at Schools Updated November 2005. Available from: <https://www.nhlbi.nih.gov/files/docs/public/lung/resolut.pdf>. Accessed: 2014 September 2.
18. Joint Statement on Improving Asthma Management in Schools. Available from: <http://www.lung.org/assets/documents/asthma/joint-statement-improve-asthma-mgmt-schools.pdf>
19. American Lung Association. Asthma-Friendly Schools Initiative Toolkit. 2005 Available from: <http://www.lung.org/lung-disease/asthma/creating-asthma-friendly-environments/asthma-in-schools/asthma-friendly-schools-initiative/toolkit/>. Accessed: 2014 September 5.
20. American Lung Association. A National Asthma Public Health Agenda. 2009 Available from: <http://www.lung.org/lung-health-and-diseases/lung-disease-lookup/asthma/asthma-education-advocacy/national-asthma-public-policy-agenda/> Accessed: 2014 September 2.
21. Jones SE, Wheeler LS, Smith AM, McManus T. Adherence to National Asthma Education and Prevention Program's "How Asthma-Friendly is Your School?" Recommendations. *J of School Nursing* 2009; 25:382-394.
22. National Asthma Education and Prevention Program. Asthma and physical activity in the school. 2012 Available from: http://www.nhlbi.nih.gov/files/docs/public/lung/phy_asth.pdf. Accessed: 2014 September 4.

23. National Asthma Education and Prevention Program. Guidance for Health Care Providers Who Prescribe Life Saving Medications for Students With Asthma or Allergies to Self-Carry and Administer at School. 2005. Available from: http://www.nhlbi.nih.gov/health/ prof/lung/asthma/emerg_medi.htm. Accessed: 2014 September 5.
24. Yin HS, Gupta, RS, Tomopoulos S, Wolf MS, Menelsohn AL, et. al. Readability, Suitability, and Characteristics of Asthma Action Plans: Examination of Factors that May Impair Understanding. *J of American Academy of Pediatrics* 2013; 131; e116-126.
25. National Association of School Nurses. Tips for Obtaining and Disseminating Asthma Action Plans. School Nurse Asthma Management Program Resource Manual, p2-33, 2004.

Other References

- Allensworth DD, Kolbe LJ. The comprehensive school health program: exploring an expanded concept. *J Sch Health* 1987;57(10): 409–12.
- Asian Health Coalition (2012). Hepatitis Education, Screening, and Linkage-to-Care for Ethnic Communities: A Community-based Approach. Retrieved August 22, 2014, from <http://www.asianhealth.org/the-issues/viral-hepatitis/hepatitis-community-manual/>.
- Atchison JM, Cuskelly M. Educating teachers about asthma. *J Asthma* 1994;31(4):269–76.
- Bhatia, R., Hartman, C., Kallen, M. A., Graham, J., & Giordano, T. P. (2011). Persons newly diagnosed with HIV infection are at high risk for depression and poor linkage to care: results from the Steps Study. *AIDS and Behavior*, 15(6), 1161–1170.
- Centers for Disease Control: National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Division of HIV/AIDS Prevention and ICF International (2014). Planning and implementing HIV testing and linkage programs in non-clinical settings: a guide for program managers. Atlanta, GA. Available at: https://effectiveinterventions.cdc.gov/docs/default-source/public-health-strategies-docs/HIVTestingImplementationGuide_Final.pdf?sfvrsn=0
- Christopoulos, K. A., Kaplan, B., Dowdy, D., Haller, B., Nassos, P., Roemer, M., ... & Hare, C. B. (2011). Testing and linkage to care outcomes for a clinician-initiated rapid HIV testing program in an urban emergency department. *AIDS patient care and STDs*, 25(7), 439–444.
- Clark NM, Partridge MR. Strengthening asthma education to enhance disease control. *Chest* 2002;121(5):1661–9.
- Coover L, Vega C, Persky V, Russell E, Blasé R, Wolf R. Collaborative model to enhance the functioning of the school child with asthma. *Chest* 1999;116(suppl 4):193S–5S.
- Eisenberg JD, Moe EL, Stillger CF. Educating school personnel about asthma. *J Asthma* 1993;30(5):351–8.
- Evans D, Clark M, Feldman C, Rips J, Kaplan D, Levison M. A school health education program for children with asthma aged 8–11 years. *Health Educ Q* 1987; 14:267–79.
- Evans D, Clark N, Levison M, Levin B, Mellins R. Can children teach their parents about asthma? *Health Educ Behav* 2001; 28:500–11.
- Evans R, Gergen PJ, Mitchell H, Kattan M, Kercksmar C, Crain E. A randomized clinical trial to reduce asthma morbidity among inner-city children: results of the National Cooperative Inner-city Asthma Study. *J Pediatr* 1999;135(3):332–8.
- Gardner, L. I., Metsch, L. R., Anderson-Mahoney, P., Loughlin, A. M., Del Rio, C., Strathdee, S., ... & Holmberg, S. D. (2005). Efficacy of a brief case management intervention to link recently diagnosed HIV-infected persons to care. *Aids*, 19(4), 423–431.
- Hay GH, Harper TB, Courson FH. Preparing school personnel to assist students with life threatening food allergies. *J Sch Health* 1994;64(3):119–21.
- Henry RL, Hazell J, Halliday JA. Two hour seminar improves knowledge about childhood asthma in school staff. *J Pediatr Child Health* 1994;30:403–5.
- Lurie N, Straub MJ, Goodman N, Bauer EJ. Incorporating asthma education into a traditional school curriculum. *Am J Pub Health* 1998;88(5):822.
- Lwebuga-Mukasa J, Dunn-Georgiou E. A school-based asthma intervention program in the Buffalo, New York schools. *J Sch Health* 2002;72(1):27–32.
- Madden JA. Managing asthma at school. *Educ Leader* March 2000;57(6):50–2.
- National Asthma Education and Prevention Program. *How asthma-friendly is your school?* Bethesda, Maryland: National Asthma Education and Prevention Program, National Heart, Lung, and Blood Institute, 1997.
- Public Health Service. *Action against asthma: a strategic plan for the Department of Health and Human Services*. Washington, DC: U.S. Department of Health and Human Services, Public Health Service, May 2000.
- Rossman, A. (2011). Linkage to Care: Linking Newly Diagnosed HIV-Infected Persons to Medical Providers through Linkage-to-Care Case Management (LTC). AIDS Education and Training Center. Retrieved August 27, 2014, from <http://aidsetc.org/resource/linkage-care-linking-newly-diagnosed-hiv-infected-persons-medical-providers-through-linkage> .
- Spencer G, Atav S, Johnston Y, Harrigan J. Managing childhood asthma: the effectiveness of the Open Airways for Schools program. *Fam Community Health* 2000;23:20–30.

Resources

The CDC asthma webpage links to information about asthma policies in schools

<http://www.cdc.gov/asthma/policy.htm>

The National Asthma Education and Prevention Program, Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma, 2007

<http://www.nhlbi.nih.gov/files/docs/guidelines/asthgdln.pdf>

CDC Healthy Schools Program Website

<https://www.cdc.gov/healthyschools/index.htm>

Whole School, Whole Community, Whole Child (WSCC)

<https://www.cdc.gov/healthyschools/wcc/index.htm>

Initiating Change: Creating an Asthma-Friendly School

<http://www.cdc.gov/healthyschools/asthma/creatingafs/index.htm>

Acknowledgments

The following served as members of the Schools Work Group and provided assistance to the development of the Strategies for Addressing Asthma in Schools document. The affiliations listed are those of the contributors at the time they participated.

Centers for Disease Control and Prevention

National Asthma Control Program

Paul Garbe, DVM

Pamela Collins, MPA, MSA

Paige Welch, BA

Gary Coil, MPH

School Health Branch

Zanie Leroy, MD, MPH

This report was supported in part by an appointment to the Research Participation Program at the Centers for Disease Control and Prevention administered by the Oak Ridge Institute for Science and Education through an interagency agreement between the U.S. Department of Energy and CDC.

Emily Gardner, MPH, Oak Ridge Institute for Science and Education Fellow

Columbus Technologies and Services, Inc., Sarah Gill, MPH, assigned full-time to the National Asthma Control Program, Air Pollution and Respiratory Health Branch, Division of Environmental Hazards and Health Effects, National Center Environmental Health, Centers for Disease Control and Prevention, Atlanta, Georgia.

National Asthma Control Program Grantee Partners

Connecticut Department of Public Health

Marie Bournaki, PhD, RN

Missouri Department of Health and Senior Services

Peggy Gaddy, RRT, MBA

Eric Armbrecht, PhD

Utah Department of Health

Kellie Baxter

Rebecca Giles, MPH, CHES

American Lung Association

Barbara Kaplan, MPH, CHES

Special Acknowledgments to Marjorie Cole, MSN, RN, Missouri State School Nurse Consultant Missouri School Health Program

For more information please contact

Centers for Disease Control and Prevention
1600 Clifton Road NE, Atlanta, GA 33029-4027

Telephone: 1-800-CDC-INFO (232-4636)

TTY: 1-888-232-6348

E-mail: cdcinfo@cdc.gov

Web: www.atsdr.cdc.gov

Publication date: January 2017