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IAQ Tools for Schools

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B U L L E T I N

Childhood Asthma: Do you know the causes, signs, and latest statistics?

Five million children, or 11 percent of the U.S. child population, have asthma—a leading cause of school absenteeism and pediatric hospital admission. According to The New England Journal of Medicine, children with asthma miss 10 million school days each year and spend an estimated 7.3 million days per year restricted to bed.

Asthma is a chronic respiratory disease that causes the airways in the lungs to swell and constrict, usually in what is called an asthma "episode." An asthma episode occurs due to the inflamation in the lining of the respiratory tract, tightening of the muscle, and increased secretion of mucus in the airway, resulting in narrowed airways and breathing difficulty. Common asthma symptoms include chest tightness, wheezing, and coughing.

Asthma rates have increased drastically during the past 20 years. In fact, the number of asthmatics in the U.S. has more than doubled since 1980, from 6.7 million to about 15 million. A study conducted by the Johns Hopkins University School of Public Health estimates that, if asthma rates continue to rise

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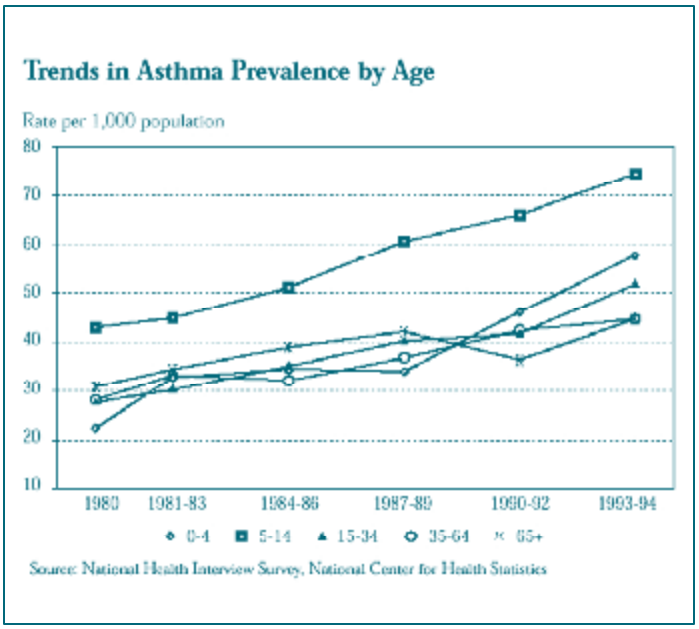

Asthma Triggers Commonly Found in School Buildings

The most successful technique for managing asthma in the school environment is avoiding "triggers," which are substances that can cause an asthma episode or allergic reaction. When children with allergies come in contact with irritants or triggers, they may experience congestion, a runny or itchy nose, and watery eyes. Children with asthma may cough, wheeze, or experience shortness of breath and chest tightness.

A recent study by the American Academy of Allergy, Asthma, and Immunology (AAAAI) found that 41 percent of the children with asthma surveyed had as many as three asthma episodes each month at school. Untreated or unrecognized asthma and allergy symptoms sparked by classroom triggers can interfere with participation in sports, school trips, physical education classes, and play activities. They can also interfere with a child's energy level, concentration, attention span, cognitive functioning, and peer relations. Parents should make school personnel aware of their child's asthma or allergy condition so that school officials can work to help the child avoid triggers.

The most common asthma and allergy triggers found in schools come from living organisms such as trees, plants, fungus, insects, or animals. Cockroaches, dust mites, mold, animal dander, and secondhand smoke can aggravate a student's allergies or asthma. Pollen and ozone have also been shown to trigger asthma episodes. Chemicals such as formaldehyde and nitrous oxides can be respiratory tract irritants.

The article, "10 Ways to Manage Asthma in Schools," included in this Bulletin on pages 2-3 is a helpful resource for asthma trigger management. For more detailed information on these asthma and allergy triggers, consult your *IAQ TfS* Kit or visit EPA's *Indoor Air Quality Tools for Schools* Web site at www.epa.gov/iaq/schools.

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10 Ways to Manage Asthma in Schools

Asthma is a manageable disease. If students and staff are proactive about assessing the school indoor environment and identifying potential asthma triggers, they can reduce incidences of asthma episodes. EPA's *Indoor Air Quality Tools for Schools* (*IAQ TfS*) Kit is a great resource for identifying pollutants in schools which may exacerbate asthma. Following are 10 tips for managing asthma in schools. For more information on each, consult your *IAQ TfS* Kit or the links provided.

1. Use EPA's *Indoor Air Quality Tools for Schools* Kit. The *IAQ TfS* Kit helps school personnel identify, solve, and prevent indoor air quality problems in the school environment. Improving your school's indoor air quality will aid children with asthma by reducing school allergen levels and exposures, improving classroom comfort, and promoting asthma awareness. The checklists included in the Kit help assess the school building's ventilation system, maintenance procedures, classrooms, and food service areas. Students and school staff can play an integral role in the success of a school's IAQ program. See page 7 in this Bulletin for ideas on classroom activities that promote IAQ and asthma awareness among students and staff.

2. Control Animal Allergens. Proteins that act as allergens in the dander, urine, and saliva of warm-blooded animals can trigger allergic reactions and asthma episodes. Children with asthma and allergies are especially susceptible to animal allergens. To decrease the chances of allergic reactions or asthma episodes, pets should be removed from the classroom. If this is not possible, try to locate animals away from sensitive students and the classroom's ventilation system. In addition, the animal's cage and the classroom must be cleaned frequently. Once pets are removed, and even after extensive cleaning, pet allergens may remain in the indoor environment for several months.

3. Control Cockroach Allergens. Cockroach saliva and waste contain proteins that can act as allergens, causing allergic reactions or triggering asthma episodes. Integrated Pest Management (IPM) practices help prevent and manage cockroach and other pest problems. Four key IPM methods for reducing exposure to pests in the school setting include (1) looking for signs of pests; (2) not leaving food, water, or garbage exposed; (3) removing pest pathways and shelters; and (4) using pest control products such as poison baits, traps, and pesticide sprays as needed. Examples of other effective techniques include relocating dumpsters away from school buildings, reviewing food handling and storage procedures in food preparation areas, and fixing plumbing leaks and other moisture problems. Look to the *IAQ TfS* Kit for more information on cockroach allergens and IPM.

4. Clean Up Mold and Control Moisture. Molds reproduce by emitting tiny spores that travel through the air and grow when they land on damp surfaces. Mold growth in a school building can cause allergic reactions and asthma episodes. While no practical method exists to eliminate all mold and mold spores in a school building, controlling and minimizing mold growth can greatly improve the health of sensitive students and staff. Moisture problems in schools—roof, window, and plumbing leaks, condensation, and excess humidity—are often the source of mold growth. To prevent mold growth, fix moisture problems and thoroughly dry all wet areas within 24 to 48 hours. Should mold growth occur on hard surfaces, clean with water and detergent and dry thoroughly. Venting showers and other moisture sources within the school will help reduce indoor humidity. The school building should be inspected for moldy odors and water stains, especially under sinks, on ceiling tiles, in bathrooms, and in air conditioner or refrigerator drip pans. Adding insulation to cold surfaces such as windows, piping, exterior walls, and the roof can reduce the potential for condensation.

5. Eliminate Secondhand Smoke Exposure. Secondhand smoke causes a number of serious health effects in young children, including coughing and wheezing, bronchitis and pneumonia, ear infections, reduced lung function, and increased frequency of asthma episodes. EPA estimates that between 200,000 and 1 million children with asthma have their condition made worse by exposure to secondhand smoke. Research also suggests that secondhand smoke may cause asthma in pre-school children. Most schools in the United States have banned smoking. Despite the ban, smoking sometimes still occurs in school bathrooms, lounges, and on school grounds. Even if smoking is confined to specific rooms or the outdoors, smoke can travel through the ventilation system, exposing others in the school to the fumes. Enforcing smoking bans is important because secondhand smoke exposure can cause problems for students and staff with asthma.

6. Reduce Dust Mite Exposure. Dust mite allergens may trigger an allergic reaction or an asthma episode in sensitive individuals. Evidence shows that dust mite exposure may lead to the development of asthma in children. Although too small to be seen, dust mites are found in homes, schools, and buildings throughout the U. S. In schools, they live in carpets, upholstered furniture, clothes, pillows, and stuffed toys where they feed on dead skin flakes. To reduce dust mite exposure in the school building, choose washable stuffed

toys, and clean them often in hot water. Cover classroom pillows with dust-proof, zipped covers. Dust hard surfaces often with a damp cloth, and vacuum carpet and upholstered furniture to reduce dust accumulation. Classrooms should be cleaned thoroughly on a regular basis and during non-school hours as vacuuming often releases dust into the air.

7. Develop an Asthma Management Plan in Your School. Schools can support students with asthma and help them manage their condition by developing an asthma management plan. The plan should include school policies on inhaler and other asthma medication use, as well as emergency procedures to guide school staff on what to do if a student has an asthma episode. The plan can also encourage asthmatic students and their parents to provide the school with a completed student asthma action card. The National Asthma Education and Prevention Program's *Managing Asthma: A Guide for Schools* is another helpful resource to use in developing your school's management plan. Check http://www.nhlbi.nih.gov for details.

8. Provide School-Based Asthma Education Programs. Your school can empower students, staff, and parents to take control of asthma management by providing school-based asthma education programs. An excellent example of such a program is the American Lung Association's (ALA) *Open Airways for Schools* program. This program teaches students how to manage their asthma by recognizing asthma triggers in their environment, reducing their exposure to these triggers, and using their asthma medication correctly. *Open Airways for Schools* is composed of six lessons, designed for children aged 8 to 11. The 40-minute lessons can be taught by school staff or trained volunteers. Program results have been extremely positive for students—improved school performance, more confidence in their ability to manage asthma, greater influence on their parents' asthma management decisions, fewer episodes of asthma, and more active management of their asthma. For more information on this program, contact your local Lung Association at 800-LUNG-USA or visit the ALA web site at www.lungusa.org.

9. File Student Asthma Action Cards. Your school can require students with asthma to obtain and submit asthma action cards to the school nurse and classroom teachers. These cards encourage students to manage their asthma by identifying and recording asthma triggers. The card also benefits school staff and officials as it provides the students' medical information, identified asthma triggers, emergency procedures, and phone numbers. The Asthma and Allergy Foundation of America has developed a sample card, available at www.aafa.org/healthprofessionals/programsandmaterials/student_asthma_card.pdf.

10. Gather Additional Asthma Information and Resources. Establishing a file of asthma and allergy information and related resources will be a helpful reference to school staff dealing with asthma issues in the school environment. Helpful sources of information include:

- **Allergy and Asthma Network/Mothers of Asthmatics**
  (800) 878-4403
  www.aanma.org
  Ask about obtaining their school information packet.

- **American Lung Association**
  (800) LUNG-USA
  www.ala.org
  Ask about the *Open Airways for Schools* program.

- **Asthma and Allergy Foundation of America**
  (800) 7-ASTHMA
  www.aafa.org
  Ask about the Asthma Management at School presentation for parents and school staff.

- **Center for Disease Control and Prevention**
  (770) 488-7320
  www.cdc.gov
  Read more on their Asthma Prevention Program.

- **National Integrated Pest Management (IPM) Network**
  http://schoolipm.ifas.ufl.edu/
  Find out more about IPM.

- **U.S. Environmental Protection Agency**
  www.epa.gov/pesticides/ipm
  Find out more about implementing IPM in schools.

- **U.S. Environmental Protection Agency**
  www.epa.gov/iaq/schools
  Download the *IAQ TfS* Kit.

Mold Management Just Got Easier

EPA releases new document: Mold Remediation in Schools and Commercial Buildings

Mold. You've seen it growing on your shower curtain or on the month-old bagels in your bread basket. You've probably eaten a form of it in bleu cheese or taken it as part of a penicillin prescription. And you've definitely inhaled it—mold spores are abundant in outdoor environments, especially during the spring and fall. But, what exactly is mold? According to Barbara Spark, a staff member in EPA's Region 9 California office, "Saying 'mold' is like saying 'animal'—there are many different kinds with very different characteristics."

Some scientists estimate that there are more than 100,000 types of mold. Molds can produce allergens that trigger reactions in people with allergies and asthma. Molds produce irritants that can affect the respiratory system of those exposed. Some can also be toxic. Therefore, exposure to indoor mold should be avoided.

Building occupants may report a variety of health problems due to moisture and mold growth in schools, including headaches, breathing difficulties, skin irritation, and aggravation of asthma symptoms. "In fact," according to Laura Kolb of EPA, "if you see mold, you need to get rid of it, period."

Molds can be hard to find; levels fluctuate in any building depending on how air is moving through the building, and how the mold is releasing its spores. Mold is a living organism, and just like humans don't yawn or sneeze on a regular schedule, molds don't release spores at a constant rate. In schools, mold can grow almost anywhere if there is a moisture problem—hidden within the walls of a classroom, on ceiling tiles, in unit ventilators, or behind blackboards, file cabinets, or vinyl wallpaper.

Mold requires moisture to grow; so buildings should be kept dry. If moisture problems occur in a school, they need to be addressed immediately. Mold may grow on materials that remain wet for more than 48 hours, regardless of the climate. And, it is not enough to merely disinfect and dry the area; killing mold does not decrease the health effects associated with exposure because people are allergic to the dead mold as well. Instead, material saturated with mold should be completely removed from the building using safe handling techniques.

EPA released a document to help facility managers, teachers, parents, school officials, or anyone else interested in combating the issue of mold in schools or commercial buildings. *Mold Remediation in Schools and Commercial Buildings* is a guide that offers accurate, clear, and manageable advice for dealing with mold and clean water problems. This publication covers remediation guidelines, health effects, personal protective equipment, and much more. Checklists for mold remediation, a glossary of key terms, other resources, and communication strategies are also included. You can download *Mold Remediation in Schools and Commercial Buildings* from www.epa.gov/iaq/molds or call 800-438-4318 to request a free copy.

If you find or suspect a water or mold problem in your school building, don't wait. By acting early you can prevent damage to the building materials and furnishings, save money, and avoid potential health risks.

Fast Facts

The cost of asthma in 1998 was estimated to be $12.6 billion.

Many asthmatic children are more likely to have an attack during the winter than they are during the summer. This is at least partly attributable to the fact that they spend more time inside during winter months, where airborne pollutant concentration is generally much higher than it is outside.

Asthma tends to run in families. People with a parent or sibling with asthma are more likely to develop asthma themselves.

An estimated 40 to 50 million Americans suffer from allergies. Allergies are the most frequently reported chronic condition in children, limiting activities for more than 40 percent.

Reference: American Academy of Allergy, Asthma, and Immunology (AAAAI) at www.aaaai.org

Montgomery County Asthma Improvement Resources (AIR) Coalition

A collaborative approach to changing the face of asthma awareness and management in schools.

Education is a high priority for Montgomery County, Maryland; more than half of the county's budget is devoted to public education. Among the various initiatives through which the county and the school district work together is one to improve asthma management among school-aged children. Asthma is a leading cause of children's school absenteeism and hospitalization in Montgomery County and nationwide. Efforts to reduce these outcomes and improve quality of life are occurring through a collaborative of Montgomery County Public Schools, the Department of Health and Human Services (DHHS), and community, public, and private organizations. Montgomery Asthma Improvement Resources (AIR), a community wide coalition to raise asthma awareness and improve asthma management in schools, and the Indoor Air Quality/Preventative Maintenance Team are moving the county in the right direction.

Background

Montgomery AIR was initiated in 1997 under the leadership of the County's Health Officer, Dr. Carol Garvey, and with the support of other health, education, and community leaders. Its membership has grown to include many health care organizations, the American Lung Association (ALA), Asthma and Allergy Foundation of America (AAFA), Montgomery County Medical Society, National Asthma Education and Prevention Program (NAEPP), Montgomery County Public Schools (MCPS), Montgomery County Department of the Environment, county hospitals, and coalitions such as the African-American and Latino Initiatives.

The Montgomery AIR Coalition's mission is to promote optimal asthma management and to reduce asthma morbidity and mortality among children. This is especially important among minorities because a greater proportion of African-American children are visiting the emergency room for asthma difficulties than are children of other races.

Montgomery AIR's Initiatives

The Montgomery Air Coalition, co-facilitated by Judy Lichty, Adventist Health Care, and Ann Yeamans, DHHS, developed a strategic plan to target schools, parents, caregivers, healthcare providers, and practitioners. Based on a cross analysis of data collected from hospitals and emergency departments in Montgomery County, DHHS's school and community nurses and health technicians focus efforts on identifying, implementing, and supporting "best practices" for IAQ and asthma management in schools. Emergency department data, which distinguishes emergency room patients by age, race, and zip code, served as the primary indicator of county regions that were most in need of an asthma management program. Nurses from the 19 schools identified in the "high-need" zip codes were trained on indoor air quality issues and asthma management in conjunction with ALA's *Open Airways* program. DHHS nurses and health room technicians, who work in MCPS schools, provide critical support to parents and school staff to educate them about best asthma practices and teach them to help students learn about and manage their asthma.

School nurses in the district were surveyed to determine how many students use action plans and peak flow meters (a device that measures how fast the user can move air out of the lungs) as part of their asthma management. Two letters were also sent out to encourage families of known asthmatic students to use the school nurse as an asthma management resource and to urge families to create an asthma action plan for their children and share it with the school. The second letter laid out Montgomery AIR's expectation that the students' healthcare practitioners follow the National Institute of Health's (NIH) protocol for asthma, which was distributed with the letter. Asthma management plans received by the school are tracked. Another survey will be conducted at the end of the year to measure the effectiveness of the coalition's outreach efforts. Through a state grant, the coalition will be able to provide schools with peak flow meters with disposable mouthpieces. This is an important asset to schools because not all students keep peak flow meters at school. Disposable mouthpieces will also allow the county to better regulate asthma management in schools because the school can track asthma reactions according to their inventory of disposable mouthpieces. If fewer disposable mouthpieces are used, one can deduct that fewer asthma attacks have occurred.

A Focus on Indoor Air Quality

Montgomery AIR's initiatives also target county pre-school children (infant to 4 years). The preschool population is actually the most susceptible to asthma problems stemming from IAQ issues and have the most frequent asthma-related emergency room visits. Through AIR, community- and school-based nurses train in preschool staff and implement the Head Start program, a child development program to increase the school readiness of children from low-income families. Community nurses provide asthma education to pregnant women and new mothers through home visiting programs.

Montgomery County also seeks to make the link between asthma management and indoor air quality. In 1997, the Indoor Air Quality Process Action Team, a work group of Montgomery County health officials, parents, employee associations, and school staff, met to evaluate school IAQ issues. The Team developed recommendations to ensure that good IAQ practices are utilized in existing MCPS facilities. In response to these recommendations, a pilot program was funded in 2000 to improve IAQ in older schools. An IAQ team of mechanical system technicians/specialists, headed by an occupational safety specialist, is funded through the District's operating budget and building improvements are funded through the capital budget. The primary goal of the pilot program is to ensure that mechanical equipment performs at optimal operating levels by addressing deferred maintenance repairs, implementing preventative maintenance (PM) plans, and training building staff on IAQ maintenance procedures for one-third of the existing MCPS facilities constructed or modernized before 1998. The pilot is being implemented to determine the effectiveness of the program and to guide future funding requests to expand the program to all MCPS facilities. The Team surveyed the heating and ventilation systems in all of the County's schools to determine their age, design, and maintenance and cleaning schedules.

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Promoting Asthma Awareness

School Nurses as Strong Proponents of IAQ Programs

Dr. Barbara Sattler, PH, RN, Associate Professor at the University of Maryland School of Medicine and School of Nursing and Director of the Environmental Health Education Center at the University of Maryland, spoke with us about the role of school nurses in establishing indoor air quality as an important issue for schools.

School nurses are in the unique position of being responsible for the health of students and staff when they are at school. As a trusted source of information about health and health risks, school nurses can play a major role in gaining school board or administrative buy-in for indoor air quality (IAQ) programs in a school or across an entire school district. Good IAQ contributes to a favorable learning environment for students, productivity for staff, and a sense of comfort, health and well-being for everyone in the school. If school nurses make a strong case for IAQ as a critical health issue for students and staff, officials should realize the need for a proactive IAQ program.

Because they offer a varied curriculum, schools have many potential sources of pollutants—art supplies and kilns, photography laboratories, cosmetology centers, and wood and metal shops, to name a few. In the workplace, these areas are regulated by Occupational Safety and Health Administration (OSHA) standards. Schools, too, are workplaces and, at the very least, should establish and maintain equivalent health and safety standards for students and staff. Nurses might argue that schools should aim for even higher standards because children are generally more vulnerable to health effects from indoor air pollutants than adults.

Many IAQ problems in schools also trigger asthma attacks, a serious health condition that is dramatically increasing among children. By monitoring and tracking asthma episodes within a school, including where the episodes are most common, the school nurse can help identify an IAQ problem for the administration. Prevalence of asthma episodes in a certain area of the school often indicates an indoor air quality issue. Priscilla Santiago, the School Nurse at Little Harbour School in Portsmouth, New Hampshire, tracked student asthma episodes to determine the effectiveness of IAQ upgrades that were taking place in the school. She found a significant decrease in both asthma episodes and in asthma medication and inhaler use for a severe asthmatic who attended the school. To learn more about Priscilla's work at Little Harbour, read the case study at www.epa.gov/iaq/schools/casestudies.html.

School nurses have the power to leverage their health knowledge to persuade school officials to form an IAQ Team and promote good indoor air quality to everyone's benefit.

A number of resources are available to school nurses looking to improve IAQ practices in their schools. EPA's *Indoor Air Quality Tools for Schools* program is a useful IAQ implementation guide. In addition, EPA's Office of Children's Health Protection and the American Nurses Association (ANA) are reaching out to the 2.6 million registered nurses in the United States, urging them to promote the importance of IAQ maintenance in schools. EPA and ANA are developing a set of continuing education courses, to be available online and as a printed insert in ANA's newsletter. The first course will address indoor air quality issues in schools.

The National Association of School Nurses (NASN) has created a "Managing Asthma Triggers Training Manual," to increase awareness of potential asthma triggers and irritants in the school environment. Using this manual, NASN is conducting state and regional workshops to train school nurses to facilitate the formation of an IAQ program within their school system. The training modules, funded through an EPA grant, provide school nurses with tools for informing school staff, parents, and students of asthma triggers and IAQ issues within the school. Nurses can present this information at staff meetings, PTA meetings, or as enhancements to classroom curricula. Many of the modules are built upon topics identified in EPA's *Indoor Air Quality Tools for Schools* Kit. With an estimated 33,000 school nurses nationwide, NASN encourages them to become agents of change by facilitating the convening of facilities manager, teachers, school officials, and parents in order to discuss and implement an indoor air quality program within the school. For more information, visit NASN's Web site at www.nasn.org.

Asthma and Allergy Activities for the Classroom

Involving students in asthma and allergy awareness activities can be a great asset to your classroom and school's health. There are many ways to accomplish this.

Lung biology and function can be taught in a science lesson. Students can learn how asthma affects the respiratory system, what provokes asthma episodes, and why it is important to remove these asthma triggers from the classroom.

Students can then break into groups and investigate the classroom, looking for potential asthma triggers. Have them list the "culprits" they identify, then facilitate a discussion of why these things trigger asthma and what can be done to help students with asthma avoid these triggers.

Here are two classroom activities to help you teach students about asthma:

Lesson 1: What does an asthma attack feel like?

You will need thin straws like those used for stirring coffee. Direct the students to take a long deep breath to feel the air fill their lungs. Then instruct them to run in place for 1 minute, stop, hold their nose, and breath through a straw . After completing the exercise, ask students how they feel. Common comments are, "I felt dizzy," or "I couldn't get enough air into my lungs!" Asthma attacks often feel similar to this exercise. Explain to students about lung function, asthma maintenance, and asthma episodes.

Lesson 2: Involve children with asthma in the lesson:

Is there a child in your class with asthma? The answer is most likely "Yes!" with asthma rates in the U.S. at 1 in 13 school-aged children. Talk to this child after class. Discuss possible ways of eliminating the identified asthma triggers from the classroom. Ask if he/she would be interested in helping to teach the class about asthma management. The child could tell students what it feels like to have an asthma attack, how he/she monitors and avoids asthma triggers, and about asthma management. The child could demonstrate the use of his/her peak flow meter, a hand-held device that measures how fast the user can move air out of the lungs. This meter is often used to monitor lung function and as a guide in administering asthma medication. The school nurse or a parent could speak to the class to demonstrate the use of an asthma inhaler.

Need some fun facts to incorporate into your lesson?

Did you know....

- Your right lung is slightly larger than the left?
- Hairs in your nose help to clean and warm the air you breathe so that your lungs don't get infected?
- The highest recorded "Sneeze Speed" is 102.5 miles per hour?
- The surface area of your lungs is about the same size as a tennis court?
- You lose half a liter of water each day by breathing?

Visit the National Asthma Education Prevention Program (NAEPP), part of the National Heart, Lung, and Blood Institute, online at http://hin.nhlbi.nih.gov/as_frameset.htm for more ideas or to download materials, activity sheets, and sample lessons for your class.

National "No Attacks" Campaign

EPA released a childhood asthma media campaign aimed at preventing asthma attacks among child populations. The national campaign includes Public Service Announcements (PSAs) in English and Spanish for television, radio, newsprint, and transit ads. The media campaign targets high population inner-city markets. Ads are to be displayed on transit and bus shelters and on outdoor buildings. The campaign encourages people to call 1-866-NOATTACKS or visit the Web site at www.NOATTACKS.org. For additional information on asthma management, callers can speak with an asthma consultant through a companion hotline operated by the Allergy and Asthma Network Mothers of Asthmatics, Inc. at 1-800-315-8056.

"By creating a program to identify school maintenance and environmental problems at an early stage, we could be more productive about dealing with these issues."

Kate Horter, Chairperson for Health and Environmental Issues, Howard County, MD School Environments Team (SET)

Howard County, located in the Washington, DC metro area, has been one of Maryland's fastest-growing regions, increasing its population by 26 percent over the past decade. During that same time period, the county's public school system has consistently received the top rating from the State of Maryland. Education is a high priority in Howard County. To maintain its reputation, school staff, parents, and students actively seek to improve the school environment. One result has been the formation of the School Environments Team (SET), a committee of the PTA Council for Howard County. Kate Horter, Chairperson for Health and Environmental Issues in Howard County, spoke about the formation of SET and their accomplishments thus far.

How was the School Environments Team started in Howard County?

Let me first explain the structure of our system in Howard County. Each of our 67 public schools has its own PTA, all of which are members of our PTA Council for Howard County. The PTA Council has a Health and Environmental Issues Committee (HEIC), which I chair. HEIC is composed of PTA members interested in various school-related issues including lighting, carpeting, indoor air quality, cleaning products, and food services. One of our goals is to be proactive and preventive in our involvement in school health issues. This led us, in 1997, to the idea for the School Environments Team (SET)—a group that would work with the PTA, HEIC, the Howard County Public School System (HCPSS), and community volunteers. To better address environmental issues in schools, HEIC formed three workgroups: Environmental Education, Integrated Pest Management, and School Environment (this includes the SET program). We began with the question, "How can we make a difference in schools?" We realized that Howard County was generally "reactive" on environmental issues in school systems. By creating a program to identify school maintenance and environmental problems at an early stage, we could be more "proactive" about dealing with these issues.

What were some of the proactive programs that were established?

Using EPA's *Indoor Air Quality Tools for Schools (IAQ TfS)* Kit as a guide, we created checklists including a "Master Checklist" and various specialized checklists for rooms with special considerations, such as a photography lab, a home economics room, and relocatable classrooms. Our hope is that the relocatable classroom checklist will be especially useful in identifying potential issues, as 50 percent of the schools in Howard County have at least one relocatable classroom, totaling 80 units. We are expanding the use of the relocatable checklist and would like to use it eventually in all of the relocatables in the county. The checklists in the Kit were particularly helpful and easily adaptable to our needs.

Were there any barriers to the process?

An important consideration in creating the SET program, of course, was money. Identifying indoor air quality problems, maintaining equipment, and performing walkthroughs are time-consuming processes, particularly if these tasks are performed in all of the county's schools. To address this issue, HEIC members designed the SET program to revolve around school-specific SET teams. Currently, team participants are usually parents from PTA and school staff. However, the SET program is designed to be flexible to allow for uniqueness in teams. For example, the team might be entirely composed of volunteers, thus saving on staff time and school funds. This flexibility allows us to streamline the process of problem identification and remediation.

Please describe the Master Checklist.

The Master Checklist is a two-page sheet with a list of 35 "check" items. To create this Master Checklist, the HEIC Committee accompanied Ron Miller and Jeff Klenk of the Howard County Public School System's Safety and Environmental Risk Management Office on walkthroughs at two schools to identify and describe what specific items should be on the Checklist. Mr. Miller and Mr. Klenk also helped us develop a school grounds checklist to watch for situations such as bushes growing over outdoor vents, open dumpster lids, dumpster proximity to school buildings, and potential insect problems.

Who is using the checklists?

Currently, the SET program is underway in seven pilot schools—one high school, one middle school, and five elementary schools. Each school's team decides how the checklists will be completed. In the high school, because of its large size, teachers fill out the checklists for their own classrooms. In some of the other schools, however, checklists are completed during walkthroughs conducted by the school team or volunteers, usually parents or teachers. From our experience, it takes an average of 15 minutes to analyze a regular classroom and 30 minutes for a portable classroom. The SET team recommends completing these checklists twice a year, as seasonal changes and wear on the classroom could generate new issues. Our hope is that subsequent walkthroughs will take less time than the initial walkthrough, not only because people will be familiar with the checklists, but also because the problems are being solved in the meantime.

What happens to the completed checklists?

First, we emphasize to the SET team members performing the walkthroughs that they are acting as observers—only recording what they see, rather than inspecting the school. Once completed, the checklists are compiled by the school's team. The team submits a list of issues identified with the relevant department within the school district (e.g., electrical office, carpentry). We are currently collecting data to determine how quickly the school system is able to address the issues raised by the checklists. Our preliminary data suggest that most issues are investigated within one or two weeks.

Has this program been successful in the school district?

Although the program has been active in schools for only one year, we are very happy with the pilot schools' participation and the results to date. We are currently collecting information on response time and student and teacher satisfaction, which we will analyze to ensure the success of the SET program in the future.

Do you have a success story that you could share?

In one school, the checklists revealed an electrical problem that was quickly corrected. In another, the walkthrough helped to identify an insect problem. Three yellow jacket nests were found during an initial walkthrough in June, but they had multiplied to 50 nests by September! It turns out that the window frames of the schools were designed with small holes so that water could drain out. These holes, however, were just the right size for yellow jackets to enter and make nests. The school system used pesticide-free methods to remove the nests and installed preventive measures that should discourage future nest building. The real success was that parents from the SET team were able to identify the problem when it was still small. Had the pilot version of SET been more successful at identifying the steps to take when an observation required additional action, the 50 nests could have been prevented.

> ***"With teachers and school facility and maintenance staff so pressed for time and resources, parent involvement has been a real asset to the SET program."***
>
> —Kate Horter
> Howard County, MD

Where do you see the SET program going in the next few years?

We'd like to expand SET so that all Howard County schools have teams and are actively using the checklists. The purpose of the pilot is in part to identify where we need to improve SET materials—and this is definitely an area in need of attention. Information gathered from pilot schools is critical to fine tuning the program. We need their feedback to help us improve the checklists and tell us (1) what a realistic frequency for the program would be, (2) what resources they need, (3) what needs better explanation on the checklists, (4) what team composition and strategy for doing the walkthroughs was most effective at each school and, most importantly, (5) whether the program raises environmental awareness. The pilot schools deserve tremendous credit. Our hope is that the data we analyze will help us refine the program for better, more efficient implementation in the remaining schools. We also would like to get more involved in asthma awareness in the schools. We have been approached by the American Lung Association (ALA) to work in conjunction with their *Open Airways* program. My hope is that we will develop some system to monitor asthma in the schools.

Do you have any tips for school districts looking to implement similar programs?

One of the greatest things about the SET program is that it gets parents involved. In fact, in most schools, the SET team relies heavily on parent involvement. The rewards for this are threefold: first, it facilitates parent-teacher and parent-school administrator interaction; second, it streamlines the problem identification and resolution process by taking these initial steps out of the hands of facilities managers, allowing them more time to address and evaluate potential issues; and, third, it educates parents on indoor air quality issues, which often results in parents applying these techniques in their homes, making for a healthier home life for students. With teachers and school facility and maintenance staff so pressed for time and resources, parent involvement has been a real asset to the SET program.

What's Going On Around the Country

New Hampshire is COSHing In Rewards!

The New Hampshire Coalition for Occupational Safety & Health (NHCOSH) has decided to take an aggressive approach to counter the increasing asthma rates in New Hampshire school systems. Sandi Chabot, the NHCOSH Program Coordinator, visited several school districts in cooperation with a statewide school asthma pilot program developed by a sub-committee of the New Hampshire Asthma Educators Coalition. NHCOSH plans on using EPA's *Indoor Air Quality Tools for Schools* Kit to assist schools in forming IAQ teams. If you work in any of the New Hampshire schools and would like further information, contact Sandi Chabot at 603-226-0516.

New Year's Resolutions

Constituents of the American Public Health Association (APHA) have presented draft resolutions regarding indoor air quality, children's health, and childhood asthma rates. These resolutions call for a national program to monitor and reduce asthma rates and a commitment to improve indoor school environments. The resolutions cite the increasing need for new school facilities, the government's commitment to children's health, and the asthma epidemic in the U.S. as a few of many convincing reasons to adopt policy to regulate indoor air quality in schools.

Just Breathe

The American Lung Association's (ALA) *Open Airways For Schools* (OAS) is an asthma management program for children, delivered in the school setting. It was developed and scientifically evaluated by researchers at Columbia University's College of Physicians and Surgeons. The long-term goal of the OAS program is to protect lung health through the implementation of the program in all elementary schools in the country. Researchers found that children who completed the program showed increased school performance; demonstrated more confidence in their ability to manage their asthma; exerted greater influence on parents' asthma management decisions; had fewer, less severe asthma episodes; and took more steps to manage their asthma. Since ALA began the program in 1996, 282,215 children and 17,348 volunteers have been trained, and 28,438 kits have been distributed. The OAS program has been carried out in 24,687 schools including 1,256 private and 23,431 public schools. For more information on OAS call 800-LUNG-USA or visit www.lungusa.org.

Asthma Resources at Your Fingertips

Responding to the growing asthma epidemic, the National Education Association Health Information Network is developing an "Asthma and Schools" Web site, consolidating information about asthma-related resources (books, fact sheets, policy statements, videos, pamphlets, etc.) for school personnel (teachers, administrators, nurses, maintenance and facilities staff, food service workers, bus drivers, etc.) working with grades K-12. The Web site is now available. To submit information online, go to http://.asthmaandschools.org. For a copy of the submission form, please contact Jennie Young at 202-822-7481 or jyoung@nea.org.

UnLEADed, Please

EPA will adopt new standards to help childcare providers and schools identify areas that contain hazardous levels of lead. Lead exposure, through breathing or ingestion, can cause many adverse health effects, including brain damage, kidney problems, and learning difficulties. In response to a request from Congress for new standards in 1992, the lead guidelines (some five times more stringent than those they replace) will give federal, state, and local officials uniform benchmarks for judging potential lead-poison threats, particularly to children. The rules declare that a hazard exists if there are more than 40 micrograms of lead per square foot on floors; 250 micrograms of lead per square foot on window sills; 400 parts per million of lead in the soil of a children's play area; and 1,200 parts per million of lead in soil elsewhere in the yard. The new standards will be available online at www.access.gpo.gov/su_docs/aces/aces140.html and for information about lead issues in schools and homes visit www.epa.gov/oia/tips/lead2.htm.

Fast Facts

Each year, nearly 5,100 people in the United States die as a result of asthma.

Each day, 14 people die from asthma.

Asthma-related deaths among children have tripled since 1980.

Asthma is the only chronic disease, besides AIDS and tuberculosis, with an increasing death rate.

Asthma has reached epidemic proportions. The prevelence of asthma is higher among children than adults, and higher among blacks than whites.

Reference: The Asthma and Allergy Foundation at www.aafa.org

Montgomery County AIR Coalition *(continued from page 5)*

They also examined school carpets and mold levels. In 2000, the IAQ Team developed a proactive maintenance plan through which 53 schools will be evaluated for IAQ over three years. With $1.3 million in their budget last year, the IAQ Team evaluated 26 schools, completed IAQ upgrades, and established IAQ school maintenance plans. This year, a budget of $1.6 million is proposed to complete the project in the 53 schools. The District plans to phase EPA's *Indoor Air Quality Tools for Schools* (*IAQ TfS*) Program into all 191 schools in Montgomery County and train staff on the Program. IAQ Team members are also studying new construction and building upgrade techniques to ensure good indoor air quality in schools. Montgomery County is beginning to develop regulations to monitor school IAQ in these situations. Members of the IAQ Team are also members of Montgomery AIR.

Montgomery County nurses are also involved with tracking asthma and indoor air quality problems in schools. As MCPS sets up the 53 schools with their proactive IAQ and asthma management plans, one of the pieces will be a system for nurses to track not only asthma episodes, but other indicators of indoor air quality issues such as nose bleeds. Though they have not found a direct link between the incidence of asthma episodes and known IAQ problems in schools, the District continues to track asthma because of the concern about and general awareness of IAQ factors that impact health.

A Community Program

There are many opportunities for parents and families to become involved with MCPS to support good asthma management. Some members of the Montgomery County PTA are members of the IAQ Advisory Team. Parent involvement is essential in developing asthma action plans for their children with asthma. Parents can also participate in asthma management training by volunteering in the classroom through the *Open Airways* program. Through the Head Start outreach, parents will soon have a greater opportunity to receive asthma management training.

Montgomery AIR has largely been data driven. When confronted with the statistics that asthma is the leading cause of emergency room visits for children in Montgomery County and a leading cause of school absenteeism nationwide, they felt that they had little choice but to redirect MCPS resources to address this issue.

Montgomery County recommends that other schools or districts looking to create a similar program make sure that their plans and approaches are well thought out. Rushing into a program isn't the answer they say; they recommend addressing these issues in a staged approach to evaluate what does and doesn't work for the schools or districts.

Information Resources

To order the *Indoor Air Quality Tools for Schools* Kit:

To order the Kit free of charge, call the EPA IAQ Hotline at (800) 438-4318. The Kit's printed materials are now available on CD-ROM, or you can download a text-only version from our Web site at www.epa.gov/iaq/schools.

We'd Like to Hear From You!

In future editions of the *IAQ Tools for Schools* Bulletin, we would like to share some of your experiences with indoor air quality issues, successes, and challenges. Whether you use the guidance in our Kit, or another means of improving the air quality in schools, we would like to hear from you.

Contact Information

Send **Bulletin** submissions to:

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For Additional Information About Articles in this Issue:

EPA Indoor Air Quality Hotline: (800) 438-4318.

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Childhood Asthma *(continued from page 1)*

unabated, a child born 20 years from now will be twice as likely to develop asthma as a child born today. Asthma development may be associated with genetics and the environment. Scientific evidence links exposure to some allergens (dust mites) and irratants (second-hand smoke) to the development of asthma in young children. In addition, asthma triggers, factors that exacerbate asthma, may include colds, stress, emotional factors, biological and chemical triggers, and other environmental factors. In schools, triggers such as animal dander, cockroach allergens, and molds can cause asthma episodes. Pollen, ozone, and some chemical products found in schools can also irritate the respiratory system.

Despite the rising asthma rates and the many substances that can trigger an episode, asthma is a manageable disease. Asthma control is defined as the absence of symptoms and episodes, no use of relief medication, no emergency room visits, normal activity level, and normal lung function. Recognizing and avoiding asthma triggers, adhering to a physician's prescribed program, and asthma education are important steps in effective asthma management. To learn how to better control asthma and prevent asthma episodes in your school system consult "10 Ways to Manage Asthma in Schools" on pages 2-3 of this Bulletin.

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