Managing Asthma in the School Environment
Thursday, May 13, 2010
1:00 – 2:30 PM EST

Access Number:
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ID: 66080666

Pediatric Environmental Health Specialty Units Overview
• Community Education and Outreach
  • Raising awareness about environmental conditions that may harm children and providing guidance on preventing exposures
• Training Health Professionals
  • Conducting conferences, on-line education programs and case studies
• Consultation and Referral
  • Interrupting diagnostic tests and evaluating toxic exposures

IAQ Tools for Schools Program
The Framework for Effective School IAQ Management:

Six Key Drivers

- Quality HVAC
  - Inspect HVAC systems regularly
  - Establish a maintenance plan
  - Change filters regularly and ensure condensate pans are draining
  - Provide outdoor air ventilation according to ASHRAE Standard or local code
  - Clean air supply diffusers, return registers, and outside air intakes
  - Keep unit ventilators clear of books, papers, and other items

- Control of Moisture/Mold
  - Conduct routine moisture inspections
  - Establish mold prevention and remediation plan

- Effective Cleaning & Maintenance
  - Conduct routine inspections of school environment
  - Develop a preventative maintenance plan
  - Train cleaning/maintenance staff on protocols
  - Ensure material safety data sheets (MSDS) are available to staff
  - Clean and remove dust with damp cloth
  - Vacuum using high-efficiency filters

- Smart Materials Selection
  - Maintain products inventory
  - Develop low-emitting products purchasing and use policies
  - Use only formaldehyde-free materials
  - Use only low-toxicity and low-emitting paint
  - Select products based on product rating systems
  - Use least toxic cleaners possible (only those approved by the district)

- Aggressive Source Control
  - Conduct regular building walkthroughs
  - Test for radon; mitigate if necessary
  - Implement a hazardous materials plan (use, label, store, and dispose)
  - Implement Smoke-Free policies
  - Establish an anti-idling school bus policy
  - Use walk-off mats at building entrances
  - Control pollution-emitting activities when feasible

The Framework for Effective School IAQ Management:

Six Technical Solutions

- Quality HVAC
- Control of Moisture/Mold
- Effective Cleaning & Maintenance
- Smart Materials Selection
- Aggressive Source Control

Does your school currently have an asthma management program in place?

- Yes, we have a sustainable asthma management program.
- Yes, we have a program in place but want to improve.
- Yes, but we just started.
- No, but we are excited to start.
How confident do you feel in your ability to reduce environmental asthma triggers in your school district?

- 35% I am not very confident, but I am eager to learn.
- 23% I am getting more confident in facing our challenges.
- 9% I am confident, but excited to learn more strategies.
- 33% I am confident in our ability to reduce asthma triggers.

**Introductions**

**Facilitator:**
- Lani Wheeler, M.D., FAAP, FASHA, The Cadmus Group, Inc.

**Speakers:**
- Robert Geller, M.D., FAAP, Director, Emory Southeast Pediatric Environmental Health Specialty Unit
- Leslie Rubin, M.D., FAAP, Co-Director, Emory Southeast Pediatric Environmental Health Specialty Unit

**ASTHMA and the SCHOOL**

Robert J. Geller, MD, FAAP
Emory Southeast Pediatric Environmental Specialty Unit; Children’s Healthcare of Atlanta, Children’s Asthma Center at Hughes Spalding, and Emory University Dept of Pediatrics, Atlanta GA

I. Leslie Rubin, MD, FAAP
Emory Southeast Pediatric Environmental Specialty Unit; Institute for the Study of Disadvantage and Disability, and Morehouse School of Medicine, Atlanta GA

**Disclaimer**

- Drs Geller and Rubin are co-editors of a book on school environments. They have no other financial relationships to report pertaining to school health, school environments, or asthma.

**Outline of Presentation**

- What is asthma
- Current regimens for asthma management
- Impact of the school environment on asthma
- Suggested school role for asthma exacerbations
- Suggested school role for chronic asthma management
- Asthma in the child with disabilities

**Definition of Asthma**

- Asthma
  - A *chronic, inflammatory* disorder principally of the small airways
  - Obstruction to airflow
  - By definition, at least partial reversibility of airflow obstruction, on some or all occasions
**Time Course**

- Early phase
  - Airway constriction
- Late phase (6 – 10 hours or longer)
  - Swelling of the airway
  - Increased mucous in the airway

**Goals Of Maintenance Asthma Therapy**

- Minimal chronic symptoms - ideally none
- Minimal asthma attacks - ideally none
- No emergent visits for asthma care
- Minimal need for quick relief $\beta_2$ agents
- No limitations on exercise or activities
- Near-normal lung function
- Minimal (or no) adverse med effects

**Evaluating Asthma**

- Patient report
- Clinical exam
  - wheeze, cough, rhonchi
  - decreased breath sounds, air flow
  - increased work of breathing
- Severity of asthma may be unrecognized and underestimated by the child

**Rescue Therapy - $\beta_2$ Agonists**

- Short acting beta$_2$ agonists
  - Albuterol (ProAir, Ventolin, Proventil)
  - Xopenex (neb levalbuterol)
  - Maxair (pirbuterol)
  - Should be used in all asthmatics at onset of wheeze, chest tightness, shortness of breath
  - Expect response in 5 - 10 min or less
  - Routinely used before exercise

**Control Therapy**

- Patients with symptoms more than once a week should be using controller(s) to reduce baseline inflammation and airway irritability
- Some patients need one agent, some more than one
- Can be administered once daily or more, depending on specific drug

**Control Therapy - 2**

- Inhaled corticosteroids the usual first-line agent
  - Flovent, Qvar, Azmacort, Pulmicort, others
- Some patients on leukotriene receptor antagonists
  - Singulair, others
- Some patients on long-acting bronchodilators
  - Contained in Advair, Symbicort
Spacers
- Should be used with all metered dose inhaler medications
- Improves drug delivery substantially

Role of Asthma Action Plan
- Every child with asthma should have an asthma action plan describing their current regimen
- School should have a copy of that data

Asthma Action Plan

Exacerbating Factors for Asthma
- Inhaled allergens
  - Molds, dust mite, animal dander, pollens
- Chemical irritants
  - Strong odors, some cleansers
  - Air pollutants (ozone, particulates, etc)
- Heat, cold
- Exercise

School Role in Exacerbations
- 1. Recognize
- 2. Respond
- 3. Reassess
- 4. Record

School Recognition
- Teachers and others with child contact should be able to recognize shortness of breath, audible wheezing, at the non-health-professional level
- All staff should give credence to children reporting symptoms, unless consistently proven otherwise
School Response

- Allow child to carry his/her own medications unless they are unable to hang onto them
- Supervise use of or administer reliever medication (e.g., albuterol)
  - A staff member who is trained to supervise medication use needs to be available at all times students are on premises
  - In some states, may need to be a licensed nurse, physician, RT

School Response - 2

- If symptoms appear severe, call 911
- Record child’s need for rescue medication and circumstances
  - May want to share info with parent, especially if this is a frequent event

School Reassessment

- Has child returned to asymptomatic state?
- If not, give a second dose of reliever (e.g., albuterol)
- Reassess again in 10 minutes:
  - Has child returned to asymptomatic?
  - If not, needs to be taken for med care

School Recording

- Need info to advise parent about need for different home management
- Need info to advise IEP if appropriate
- Need info to support school’s actions in case they are challenged

The School Environment

- Multifaceted:
  - The physical environment of the school
  - Air quality in and about the school
  - Toxic hazards in the school
- Food safety in the school
- Sports at school
- Getting to and from school

School Role in Chronic Management

- Minimize triggers in the school environment
  - Keep humidity 40% - 60% and fix leaks promptly to avoid mold overgrowth
  - Consider which cleansers, paints, markers, chalks, etc are used
  - Schedule activities using cleansers after students and staff leave or on weekends
  - Restrict access to areas under renovation
Triggers You May Not Have Considered

- All vehicles
  - Avoid vehicle exhaust fumes near the place children are spending time outdoors
  - Avoid idling
- The school bus
  - Often very bad air quality on board
  - Diesel retrofitting is an effective and cost-effective solution

School Role in Chronic Management - 2

- Schedule outdoor activities carefully
  - Check outdoor air quality monitoring data each morning
  - If ozone peaks later in the day, hold early outdoor practices and indoors activities later in the day
  - Reschedule outdoor activities on particularly bad air quality days

School Role in Chronic Management - 3

- Allow child to carry own medication when appropriate to age/development/level of responsibility
- Advise parents about frequency of symptoms = frequency of failure of control plan

School Role in Chronic Management - 4

- In some schools, for some patients, it may be appropriate for school to administer morning dose of chronic medications
  - Depends on staffing, family's ability to adhere on their own
  - Requires availability of medication
  - Requires availability of equipment at times

Special Considerations and Populations

- Children with developmental and other disabilities
- Children who grow up in circumstances of social and economic disadvantage

Questions?
**Children with Cerebral Palsy**

- Have ambulatory difficulties
- Have orthopedic problems
- May have a seizure disorder
- May have feeding difficulties
- May have respiratory problems
- May have multiple doctors, multiple medications and multiple illnesses

**Children with Autism**

- Have limited ability to communicate their feelings
- Are very sensitive to the environment
- Do very well with structure and predictability
- May react dramatically to relatively minor changes or perceived disturbances
- Are likely to respond well to calm, quiet comfort

**Obesity Rates in the USA**

<table>
<thead>
<tr>
<th>Age</th>
<th>% Overweight</th>
<th>% Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - 5</td>
<td>21.2</td>
<td>10.4</td>
</tr>
<tr>
<td>6 - 11</td>
<td>35.5</td>
<td>19.6</td>
</tr>
<tr>
<td>12 - 19</td>
<td>34.2</td>
<td>18.1</td>
</tr>
<tr>
<td>2 - 19</td>
<td>31.7</td>
<td>16.9</td>
</tr>
</tbody>
</table>

*Data taken from the 2007 – 2008 National Health and Nutrition Examination Survey*

**Children with Obesity**

- High Blood Pressure
- Diabetes
- Asthma
- Obstructive Sleep Apnea
- Physical Participation
- Social & Emotional Consequences
- Impact on Education

**Food Environment in Schools**

**Social & Economic Circumstances**
School Conditions & Indices of Income

Household Income and Asthma Prevalence

Poverty Effects on Cognitive and Educational Function

Cycle of Environmental Health Disparities

Break the Cycle: a Project of the Southeast PEHSU

Questions?
So, where are we nationally?

**CDC School Health Profiles Survey**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Range %</th>
<th>Median %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Had adopted a policy stating that students are permitted to carry and self-administer asthma medications</td>
<td>64.3% to 80.6%</td>
<td>76.5%</td>
</tr>
<tr>
<td>Had a full-time, registered nurse who provided health services to students</td>
<td>3.6% to 19.1%</td>
<td>40.2%</td>
</tr>
<tr>
<td>Had an asthma action plan for all students with known asthma</td>
<td>27.0% to 77.3%</td>
<td>46.1%</td>
</tr>
<tr>
<td>Tried to increase student knowledge of asthma awareness as part of a required course</td>
<td>25.5% to 76.4%</td>
<td>47.0%</td>
</tr>
<tr>
<td>Health education teacher received staff development on asthma awareness</td>
<td>0.0% to 43.0%</td>
<td>17.3%</td>
</tr>
</tbody>
</table>

Addressing Triggers

- Soliciting input from all school constituencies
  - Parents, students, all types of staff
- EPA Tools for Schools
  - Can help identify and address IAQ environmental issues
- Looking a fresh look at the problems

What We Have Been Doing to Help

- Compiling Information
  - Edited book to present validated information from national experts
- Disseminating Information
  - Created video modules about the school environment for lay audiences
  - Available on the Internet for free non-commercial use
Selected Resources

- Contact us at 877-33-PEHSU for questions, or at: www.sph.emory.edu/PEHSU
  - Video modules about the school environment
- www.epa.gov/iaq/schools
  - Tools for Schools, IAQ
- www.asthmaandschools.org
- www.nhlbi.nih.gov
- www.cdc.gov/HealthyYouth/asthma

Questions from the audience?

EPA IAQ Tools for Schools Resources

- IAQ Tools for Schools Program
  - www.epa.gov/iaq/schools
- IAQ Tools for Schools Updates and E-mails:
  - Send an e-mail to: IAQTfSConnector@cadmusgroup.com
  - View archives at: http://www.epa.gov/iaq/schools/bulletins.html
- Schools IAQ Connector Listserv:
  - Send a blank e-mail message to schools_iaq_connector-subscribe@lists.epa.gov
  - Request subscription online on the Listserv Web interface
    https://lists.epa.gov/read/all_forums/subscribe?name=schools_iaq_connector. Then, check your e-mail inbox for your confirmation and membership details.

EPA Asthma Resources

- National Asthma Forum
  - June 17 – 18, 2010
  - Washington, DC
  - https://www.epaasthmaforum.com
- AsthmaCommunityNetwork.org – Communities in Action
  - http://www.asthmacommunitynetwork.org/