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 INDOOR AIR QUALITY

Asthma is the most common chronic disease affecting children in the U.S. today – almost one in every fourteen school aged children is a diagnosed asthmatic. Asthma is the leading cause of school absenteeism, resulting in 14 million missed school days each year!



The disease affects about 20 million people nationwide (USEPA – Indoor Air). Arizona is ranked as the second highest state in the nation with regard to the number of asthmatics, with at least a quarter of a million people affected. Counties with the highest asthma-related hospitalizations include Graham, Greenlee, Maricopa and Yuma (Arizona Asthma Coalition).

What IS asthma and what triggers it?

It is a chronic disease of the lungs in which the lining surrounding the air passages becomes inflamed due to a "trigger". With too much exposure to one or more triggers, the muscles surrounding the airways can constrict, making it difficult to either inhale or exhale. Wheezing, chest pain and tightness often also occur, resulting in an "asthma attack". These episodes (or exacerbations) can be life-threatening without immediate intervention. Asthma attacks are often avoidable; learning what triggers an individual's asthma allows them to take steps to avoid exposure whenever possible. More general asthma symptoms include wheezing, coughing, and mild forms of attack symptoms.

Most common environmental asthma "triggers" include:

- Cockroaches
- Secondhand smoke
- Animal dander
- Mold
- Dust mites
- Pollen

Common asthma triggers encountered in schools include a variety of plant pollens (from trees and grass, common in fall and spring), poor air quality (molds, pesticides, and exhaust), exercise, crying, and laughing.

How does asthma occur?

Factors influencing *why* people develop asthma in the first place include genetic tendencies, infections, and environmental factors. Early childhood (infant) exposure to environments containing pesticides has been associated with as much as a 2-4 fold risk increase for asthma development in young children (Salam *et al.* 2004).

There is no cure for asthma, but a good understanding of the disease and relevant medications can save lives.

Medications - The use of medications in children is highly individualized, based on the severity of the child's symptoms, the age of the child, and the ability of the child to take inhaled medications. The following are the most commonly used medications: **Bronchodilators** are used to help open the narrowed lungs and may relieve coughing, wheezing, shortness of breath, or difficulty in breathing. These are often considered "rescue medications" for acute attacks of asthma. **Anti-inflammatory medications** help to decrease the inflammation that is happening in the airways with asthma. **Corticosteroids** are generally controller medications and should be taken every day. **Anti-leukotrienes** are used to help decrease the narrowing of the lung and to decrease the chance of fluids in the lungs.

Consult your child's physician about the best choice for your child.

The following activity with a drinking straw can give you an idea of what an asthma attack experience is like (minus the pain, of course):

1. Take a normal, deep breath and then exhale.
2. Next, take in a breath and exhale through the straw.
3. Inhale through the straw while gently pinching it shut. This will demonstrate an asthma attack. Not only can asthmatics not take in a good breath, they can't exhale trapped air during an exacerbation. The straw game usually really surprises people who have never had asthma.

It is really scary not to be able to breathe!

- Mary Chick, Roosevelt Elementary School District Head Nurse





Integrated Pest Management and Asthma In Schools

If you're reading this, chances are you work in a school with an IPM or IAQ (Indoor air quality) program, where the entire school community plays a role in improving the school's environmental health. Below are a few important IPM//IAQ tips that will help your asthmatics be comfortable in your school:

Teachers –

- ✍ **Make sure your space is uncluttered.** This limits pest harborage. Use plastic bins instead of corrugated cardboard; keep cupboards organized and clean.
- ✍ **Maintenance requests.** Notify your facilities and maintenance folks of any leaky faucets, pipes, or moisture-prone areas.
- ✍ **Report pest sightings.** Reports are necessary to ensure that the correct IPM measures can be implemented to deal with the problem.
- ✍ **Never spray any pesticides yourself.**




-  **Limit food.** Limit consumption to occur in tiled areas and do not leave any open food out overnight – seal in airtight plastic containers.
-  **Sanitation.** Clean surfaces where food was handled or spilled that day; report to custodial staff if necessary.
-  **Pets.** Minimize the presence of furry pets if you have an asthmatic in the class.
-  **Chemicals.** Minimize the use of scented sprays and strong chemical cleaners. Asthmatics tend to be chemically sensitive in general.

Nurses – Be proactive. Know which students are asthmatic and keep an Asthma Action Card for each (available at www.epa.gov/iaq/schools/images/aac-1.gif). Nurses please note that about 20% of asthmatics are sensitive to aspirin and/or other pain medications.

Principals – Develop an Asthma Management Plan which addresses the use of inhalers on campus and emergency procedures for asthma attacks. Obtain the National Asthma Education and Prevention Program’s “**Managing Asthma: A Guide for Schools**” available online at: (USEPA – IAQ http://www.nhlbi.nih.gov/health/asthma/asth_sch.htm).

Facilities and Maintenance folks –

-  You are the educators and leaders of IPM in your district. Your program will benefit greatly – and your workload reduced – if you educate and impart good IPM/IAQ knowledge on your school faculty and staff.

How asthma-ready is YOUR school?

When it comes to assisting school staff with asthma preparedness there are an abundance of resources. A good place to start (or review your knowledge) is www.SchoolAsthmaAllergy.com, a national website with information on where to begin, links to Arizona asthma resources, and lots more helpful asthma information.



Indoor Air Quality is about more than the allergens and asthma triggers addressed above. IAQ is about the air we breathe in our homes, schools, and places of work.

The glues in our carpeting, the insulation within our walls, the paints used, and the vents overhead - all that and much more creates a concoction of contaminated pollutants we breathe into our lungs every day. With 90% of our time spent indoors, the indoor air we breathe is rapidly becoming a health issue for everyone.

One in five US Americans spends their day in an elementary or secondary school. Among them, children are those most at risk due to poor IAQ. Children have higher levels of activity and higher breathing rates compared to adults. Children also have developing lungs, and the impact of poor IAQ affects this development significantly.

Good IPM/IAQ creates a healthier environment in which to work and study

What defines poor Indoor Air Quality?

Newer and older schools alike are prone to poor air quality. Areas of the country with high humidity, such as the southeast, are environments with naturally high levels of molds and fungus, whereas those of us in the much dryer southwest tend to grow our own through faulty HVAC units. Radon, lead-based paint, pesticides, cleaning products, moisture-riddled air ducts and otherwise contaminated vents are all common examples of school-building sources of poor indoor air quality. At home, children may be exposed to pets they are allergic to, cigarette and/or wood smoke.

Fortunately, there is considerable overlap between Integrated Pest Management and Indoor Air Quality programs. The same methods used for pest prevention can also help improve air quality.

Below are a few tips school staff should keep in mind in taking a proactive approach to IAQ:

1. Follow the action guides laid out for asthma prevention for school staff. Many asthma triggers also contribute to poor indoor air quality.
2. Follow basic IPM guidelines. Insects want the same things we want: food, water and shelter. Denying pests access to our resources ensures they’ll go elsewhere. Limit sources of food and drink to outside and/or designated areas; establish good sanitation practices; and eliminate clutter.
3. Be aware of smells that don’t belong, and report them to maintenance staff.
4. Report leaky faucets, stained walls or ceiling tiles, and clogged sinks to maintenance staff.

If your school district is already involved in an IPM program – good news! Indoor Air Quality efforts, in addition to those your district already has, will be incorporated into IPM program efforts beginning 2005 as part of a new school environmental health program.

Please take asthma seriously! Asthma is the leading cause of hospitalization in children; in excess of 9 million children in the U.S. are asthmatic. They depend upon us to provide them with a healthy home and learning environment.

Information sources:

1. Arizona Asthma Coalition. Website: www.azasthma.org
2. Beyond Pesticides. School Pesticide Monitor. March/April 2004.
3. Salam, Muhammad Towhid, Yu-Fen Li, Bryan Langholz, and Frank Davis Gilliland. May 2004. Early Life Environmental Risk Factors for Asthma: findings from the Children’s Health Study. Environmental Health Perspectives. 112: 760-765.
4. USEPA Indoor Air – IAQ Tools for Schools. Website: www.epa.gov/iaq/schools/images

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Few bugs are bad! More than 95% of all insect species are beneficial to humans.