



# Allergies in the Classroom

BY HERALD A. HABENICHT AND DONNA J. HABENICHT

**A**llergies are responsible for 16.3 million missed school days per year in the U.S.,<sup>1</sup> and can affect students' performance in very significant ways.<sup>2</sup> In fact, allergies are the most common chronic health problem in Americans under 18 years of age. Estimates of those affected run between 25 percent and 40 percent of the population when all the varieties are included.<sup>3</sup> Statistics for developed and developing nations around the world are comparable to those for the U.S.<sup>4</sup>

Allergies and allergic reactions are caused by a person's sensitivity to a substance, such as pollen, dust, mold, or food (referred to as an allergen). Exposure to the allergen triggers a specific group of symptoms. Thus, tree, grass, or weed pollen act on the eyes and nose, causing red, teary eyes and stuffy, swollen nasal membranes, a condition known as hay fever. Dust, animal dander, or cigarette smoke, on reaching the lungs, cause coughing and/or wheezing, a reaction referred to as asthma. Exposure to allergens stimulates specialized cells (mast cells) to release histamine and other chemicals into the tissues, causing the symptoms.

In every classroom, at least one child in four will have allergies, most frequently in the respiratory tract, the skin, the gastrointestinal system, and/or eyes.

This article will briefly discuss five types of allergic reactions, their effect on school performance and behavior, and how the school staff and administration can help the students affected by these problems.

### Allergic Rhinitis (Hay Fever)

Hay fever, the common term for allergic rhinitis (AR), is a major cause of misery and disability around the world.<sup>5</sup> In North America, east of the Rocky Mountains, September is often the worst month of the year for allergy sufferers because ragweed is in bloom.



The allergic child with hay fever suffers sneezing spasms and feels stuffed up, while his or her nose is running at the same time. The child's nose and eyes itch, and his or her eyes are red, swollen, and tearing. These symptoms make him or her miserable and unable to function well in the classroom.

Allergic rhinitis contributes to sinusitis, Eustachian tube dysfunction (middle ear infections and hearing problems), sleep disorders, and daytime drowsiness. In one study, 88 percent of AR sufferers had some sleep problems, compared with only 17 percent of non-AR individuals, which resulted in fatigue and impaired functioning. Other problems associated with nasal allergy include more frequent absences from school, learning impairment, lower classroom productivity (93 percent of students with AR), and behavior problems.<sup>6</sup>

What can the classroom teacher do to help the child with allergic rhinitis?

1. Keep a box of tissues handy.



*Allergies and allergic reactions are caused by a person's sensitivity to a substance, such as pollen, dust, mold, or food (referred to as an allergen).*

2. Close the classroom windows.
3. Do not have furry classroom pets or allow children to bring them to school for “show and tell.”
4. Notify the parents or guardians about school problems.
5. Recommend that the child see a physician.

### **Bronchial Asthma**

Asthma is the most common chronic disease of childhood, the number one reason for children's hospitalization, and the most frequent reason for school absenteeism. Twenty to 25 percent of all school children have bronchial asthma.<sup>7</sup> The likelihood is very high that your class will contain students with asthma.

Asthma is a chronic, intermittent, breathing problem caused by (1) smooth muscle spasms that cause wheezing and chest tightness, and (2) inflammation, which in turn causes mucus, coughing, and obstruction of the small airways. Breathing becomes very difficult during an asthma attack. Seventy to 90 percent of asthmatic children have allergies. A strong genetic predisposition to asthma plays a significant role in predicting whether a child will be affected. The prevalence of asthma is increasing worldwide.<sup>8</sup>

Children with asthma visit emergency rooms at five times the U.S. average for other children.<sup>9</sup> Influenza can exacerbate asthma, particularly in children, because viral infections create mucus that clogs their airways more seriously than in adults.

### **Indications of Poor Asthma Control**

Emergency room visits  
Increased school absences  
Wheezing or coughing  
Exercise intolerance

The most frequent acute triggers of asthma are viral infections and secondhand cigarette smoke. Other important triggers include animal exposure (dogs, cats, and other pets); pollens and molds; dust and dust mites; cockroaches; smog and weather changes; respiratory irritants such as chalk dust, perfume, or chemicals; and exercise.

Laughter, crying, fear, and anxiety have a physiological effect on the body and can affect breathing. Emotions can trigger an asthma attack, make the attack worse, keep it going, and affect the student's overall functioning. Teenagers, especially, may disregard symptoms for social reasons, and deliberately expose themselves to asthma triggers. Children may express anger at not being able to do what everyone else does such as by petting an animal or eating a certain food. Children and teens who suffer from asthma may be more prone to depression.<sup>10</sup>

Children with moderate to severe asthma (especially those with frequent emergency room visits) are likely to have a

### **Life-Threatening Asthma Symptoms<sup>11</sup>**

- Chest tightness
- Wheezing
- Severe shortness of breath
- Retractions (chest or neck “sucked in”)
- Cyanosis (lips and nail beds grayish or bluish color)
- Change in mental status, such as agitation, anxiety, or lethargy
- A hunched-over position
- Breathlessness causing speech in one- to two-word phrases or complete inability to speak

peak flow meter that they may bring to school. When the child blows into the mouthpiece as forcefully as possible, the meter indicates the child's lung condition.

Each peak flow meter has a sliding scale with green, yellow, and red tabs showing the individual's condition at that moment. The child's physician has developed an individualized action plan (treatment) for each color zone. This plan should be on file at the school office, along with the child's physical and health history, and be available to the child's teacher. The plan will indicate what to do (e.g., increase medication, send the child home, call the parent, take the child to an emergency room).

Exercise is not off limits—many Olympic contestants are asthmatics. Exercise-induced asthma attacks can be avoided if the child uses inhaled medication prior to exercise. Teachers and school staff should accommodate students who use prescribed inhalers by allowing them to keep the inhaler on



their person and to self-medicate. The student must first have a doctor's approval and proper training in the use of the inhaler.

The use of inhalers should be allowed before school sports, physical education classes, band, or orchestra. Swimming in a heated pool is one of the best exercises for asthmatic children. They should also be encouraged to participate in other sports that do not require sustained, constant physical activity such as calisthenics, baseball, touch football, or doubles in tennis. Basketball and running should be avoided. Students with asthma can also participate in band or orchestra, even playing the flute, clarinet, oboe, or strings.

Occasionally, small children (kindergarten to grade 2) will need a machine nebulizer to better administer the asthma medication. Proper place and supervision should be provided when these treatments are required.

Physicians treating asthmatic children divide them into the following categories: mild intermittent, mild persistent, moderate persistent, and severe persistent. All children classified as having persistent asthma should be using inhaled corticosteroids twice daily at home. They should not need them at school. Some asthmatic children may have a rapidly active  $\beta_2$ -agonist with them at school to use as a rescue medication.

What can the classroom teacher do to help students with asthma?

1. As far as possible, remove asthma triggers from the classroom.
2. Recognize the symptoms of an asthma attack.
3. If asthma control is poor, request that the family seek medical help to improve the treatment program and the student's school performance.
4. Be sure that the child's individualized action plan (with his or her picture) is on file, along with the location of the child's peak flow meter.
5. Encourage the child to participate in sports and music activities.
6. Encourage students who use an inhaler to keep one on their person and use it before exercise or playing a band or orchestral instrument.
7. Provide a place and supervision for young children who need to use a nebulizer.
8. Familiarize themselves

with the information on the Quick Asthma Card (available at <http://www.aafa.org>), and keep a copy of the card in an easily accessible place.

10. Teach all students how to relax, express their feelings in appropriate ways, and deal positively with stressful situations.

## Food Allergies

Some of the biggest classroom challenges come from food allergies. Although only about five to eight percent of school-age children have some form of food allergy, they may require a disproportionate amount of time and accommodation. Ninety percent of all allergic reactions to food are to the BIG EIGHT foods: milk, eggs, peanuts, tree nuts, wheat, soy, fish, and shellfish.<sup>12</sup>

Symptoms of an allergic reaction to food may include: (1) gastrointestinal (abdominal cramps, nausea, vomiting, diarrhea); (2) respiratory (asthma, nasal congestion, drainage); (3) dermatological (face swelling, hives, eczema); and (4) neurological (migraine headaches).

The most serious and dreaded reaction is anaphylaxis. This all-systems, violent, immediate reaction can include any combination or all of the listed symptoms. A drop in blood pressure, shock, and death may occur without immediate intervention.

The most frequent severe food ingestion allergy (reaction to even minute amounts) is to peanuts. Thus, parents whose children have a proven or suspected peanut allergy are likely to request "peanut free" classrooms, cafeterias, playgrounds,

snack machines, etc. Some children may choose to carry a lunch from home and not eat in the school's lunchroom or cafeteria.<sup>14</sup>

The antidote to anaphylaxis is Adrenalin (epinephrine). This drug will also combat anaphylaxis from stinging insects, which is discussed later. The Food Allergy and Anaphylaxis Network Website (<http://www.foodallergy.org>) provides, free of charge, recommendations for school policies about epinephrine.

All school staff should be



## Anaphylactic Symptoms of Food Allergies<sup>13</sup>

- Skin: warmth, itching, and/or tingling, flushing, or hives
- Abdominal: pain, nausea and vomiting, diarrhea
- Oral/respiratory: sneezing, swelling of face (lips, mouth, tongue, throat), lump or tightness in the throat, hoarseness, difficulty inhaling, shortness of breath, or wheezing
- Cardiovascular: headache, low blood pressure (shock), lightheadedness, fainting, loss of consciousness, rapid heart rate, ventricular fibrillation (no pulse)
- Mental status: apprehension, anxiety, restlessness, irritability



trained to use injectable adrenaline (EpiPen® or Twinject®). Even if the school has a nurse, other adults working at the school should be prepared to handle an emergency when the nurse is not present.<sup>15</sup>

In most cases, the family should provide two adrenaline kits, one for the student to keep on his or her person, and one to store at the school. At the beginning of the school year, make sure the expiration date on the kit is at least a year in the future. If not, have it replaced with a new one.

While it is possible that a first anaphylaxis attack could occur at school and no epinephrine would be available, most affected children come to the classroom knowing they are allergic and in danger of having this type of reaction.

What can the school do to help students with food allergies?

1. Inquire about severe food allergies on registration forms. Flag the forms of children with severe food allergies.

2. Make sure each allergic child has an emergency plan (with his or her picture).

3. Suggest that the parents make a written list of foods the child must avoid, and have the child carry it with him or her at all times. Keep a copy of this list on file at the school.

4. Suggest that parents pack their child's lunch and provide an abundance of "safe" snacks for locker, desk, or backpack.

5. Be sure the student always has an adrenalin injector and that school policy allows him or her to carry it at all times. An older student can easily self-administer the epinephrine.

6. Do not allow anyone to bring food to the classroom. Suggest non-food treats or small gifts for birthday or holiday celebrations.

7. Encourage all students to respect each other's differences. Deal firmly with teasing and taunting about special needs.

### Insect Stings

The classroom is a common place to find stinging insects (honeybees, yellowjackets, hornets, wasps, fire ants), especially as the weather gets cooler and they are looking for an inside location for winter. The great majority of stings cause only a local reaction: pain, swelling, and redness. For unknown reasons, about one to five percent of those stung will develop anaphylaxis. Every minute



refrigeration.

Children at risk should avoid wearing perfumes, scented hair sprays, and bright clothes when outdoors.

What can the teacher do to help students with insect allergies?

1. Train your students to quietly "freeze" if an insect starts buzzing around the classroom. The student with insect allergies should be trained to exit to a safe place and close the door. Then you can open a window and encourage the insect to leave.

2. Be sure you know where the injectable adrenaline kit is stored and how to use it.

*Ninety percent of all allergic reactions to food are to the Big Eight foods: milk, eggs, peanuts, tree nuts, wheat, soy, fish, and shellfish.*

3. Make certain there is an emergency plan on file at the office (with the student's picture) and that you know how to follow it.

4. Request that maintenance make sure there are no obvious insect nests inside or on the outside of the school building, or in the grassy areas of the property.

### Eczema

Eczema is a chronic, recurring, inflammatory skin condition. It often occurs with other allergies, such as asthma and hay fever. About 10 percent of all children have eczema.

Common sites for eczema are the face, hands, elbows, and behind the knees. As the child grows older, eczema usually becomes less severe.

The big problems usually associated with eczema are itching and scratching with bleeding and infections, cosmetic appearance, and confusion with Impetigo. Treatment includes: Avoiding milk and dairy products if the child is allergic to them; applying moisturizing creams,





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over-the-counter mild hydrocortisone creams, and antihistamines for itching.

What can the classroom teacher do to help the student with eczema?

1. Explain to parents how eczema affects their child's school performance, and suggest they take the child to see a physician.
2. Encourage all your students to respect one another and not make fun of someone whose appearance is different. Foster empathy and support.

## School Policy Making

Before the beginning of school, preparations should be made to care for students with allergy/asthma. Administrators, teachers, the school nurse, the food service director, and the head custodian should all be involved in these plans.

1. A physical exam report and any doctor-recommended treatment program should be on file for each student with allergy/asthma (with a picture of the child).

2. Each treatment plan should have a picture of the student, for easy recognition. Provide a copy of all plans to each classroom teacher with whom the student spends time. It should include:

- Permission to administer medication on file.
- Emergency treatment programs on file.
- Priority list of persons to

contact and phone numbers.

• Where anaphylaxis is possible (food, insect sting, exercise), a plan for adrenaline (epinephrine) storage and administration must be in place.

3. If the student has a history of food allergies (milk, peanuts, nuts, eggs, wheat, etc.), suggest that the parents talk with the food service director to work out menu plans.

4. All staff should receive allergy/asthma education.

5. All staff should be trained in emergency procedures, with annual reviews.

6. The school board should examine the need for a peanut-free environment and decide to what extent the school can comply. The principal should implement the recommendations of the board, and communicate with the parents of the students involved.

## Summary and Conclusions

Nearly every teacher at every level, every year, in all parts of the world, has students with allergies in his or her classes. Most often the symptoms will be nose and eye irritation from some allergen in the air, or asthmatic wheezing from exer-

cise, chalk dust, or a pet brought to school for “show and tell.” Some children will contract poison ivy or other kinds of contact dermatitis, or eczema from milk or eggs that slipped into their diet.

If these are the worst allergic reactions that you have to deal with, consider yourself very fortunate.

While hoping for the best, every school staff member should be prepared, should a student have a reaction requiring the immediate use of epinephrine. Do not hesitate to dial 911 or to take the child to the nearest emergency room.

A wealth of useful, practical information is available at the following locations:

## Resources

### Asthma and Allergy Foundation of America

<http://www.aafa.org> – 1-800-727-8462

Free asthma/allergy action cards for school emergencies (download or request)

Many brochures. Ask about Spanish resources.

### American Academy of Allergy, Asthma and Immunology

<http://www.aaaai.org> – 1-800-822-2762

Allergy/asthma statistics with references

Pamphlets on food allergy, insect stings, asthma, etc.

“Preparing for school with allergies and asthma”

“College survival tips for allergies and asthma”

<http://www.acaai.org> – 1-800-482-7777

Fact sheets about allergy topics

### Food Allergy and Anaphylaxis Network

<http://www.foodallergy.org> – 1-800-929-4040

Program applications, anaphylaxis management, resources (Food Allergy Action Plan, School Food Allergy), Epinephrine belt packs for easy carrying

### The American Latex Allergy Association (A.L.E.R.T., Inc.)

<http://www.latexallergyresources.org> – 1-888-972-5378 — [alert@execpc.com](mailto:alert@execpc.com)

Product list of latex alternatives for schools (pencils, playground equipment, crayons, Silly Putty, gloves for cafeteria workers, etc.) [\$5]

### National Jewish Center for Immunology and Respiratory Medicine

1400 Jackson St., Rm. M-222, Denver, CO 80206-2762

1-800-222-LUNG (5864) – a nurse specialist is always on duty

### Allergy and Asthma Network - Mothers of Asthmatics

1-800-878-4403 – <http://www.aanma.org>;

e-mail: [aanma@aol.com](mailto:aanma@aol.com)

<http://www.breatherville.org/schoolhouse>

MA Report

Colorful brochures and charts for schools (and families)





**Herald A. Habenicht, M.D.**, is a Board-certified Fellow in both the American Academy of Pediatrics; American Academy of Allergy, Asthma, and Immunology; and the American College of Allergy, Asthma, and Immunology, and a retired Pediatrician and Allergist.

**Donna J. Habenicht, Ed.D.**, is

Professor Emerita, Educational and Counseling Psychology, at Andrews University in Berrien Springs, Michigan. For 15 years, she was a regular presenter on the psychological aspects of asthma for the Michigan Lung Association.

This article has been peer reviewed by a pediatrician, a medical professor/allergist, and a public health professor.

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#### CLASSROOM EXPERIENCE 1

On the first day of kindergarten, Kristie brought her new pet hamster to show the teacher. All the other students eagerly gathered around, exclaiming, "He's so cute!" Suddenly Randy, a classmate, felt faint and couldn't seem to get his breath. He wanted to get his inhaler from his book bag, but didn't know where the teacher had put it. Fortunately, his mom was still there and she noticed that Randy was beginning to wheeze. She found the book bag with the inhaler, but it didn't help. So she immediately called 911. The ambulance arrived quickly, and the paramedics helped Randy on the way to the emergency room.

#### CLASSROOM EXPERIENCE 2

Sarah, a 4th grader, had a severe peanut allergy. She had an EpiPen® in her book bag and another in the teacher's desk. She didn't eat the school lunch, but brought her own. The last day of school, the class was having a party with cake and ice cream. Unbeknownst to Sarah or her teacher, the cake frosting had peanut butter in it.

In the excitement of the party, Sarah took her plate of cake and ice cream and began to eat. Within moments, her face turned red, she began to cough, and started to itch. Sarah recognized her symptoms and ran to her teacher, who quickly got the EpiPen® from her desk, laid Sarah on the floor, injected the adrenaline in her thigh, and called 911. At the emergency room, Sarah received further epinephrine and IV medications. After a few hours, she was allowed to go home.

#### CLASSROOM EXPERIENCE 3

Roger, a Master's student in education, unexpectedly showed up at his major professor's office on a Friday afternoon. He excitedly explained that he had finished collecting the data for his thesis. His professor was surprised that he had collected the data so quickly, and inquired about his procedures. After hearing Roger explain how he had collected the data, the professor shook her head disappointedly. Roger had ignored the approved procedures, and had collected the data the way he wanted. It was garbage data, from a scientific standpoint. When the professor told him that he would have to collect data using the proper procedures, almost immediately Roger began wheezing violently. He could barely whisper. Grabbing his inhaler from his pocket, he managed to finally bring the wheezing to a lower level, just as the professor was beginning to dial 911. His professor offered to give him a ride home, but he declined, saying he thought he could manage.