



DATA HEALTH BRIEF: EPINEPHRINE ADMINISTRATION IN SCHOOLS
Massachusetts Department of Public Health
Bureau of Community Health Access and Promotion
School Health Unit
August 1, 2009 – July 31, 2010 (School Year 2009 – 2010)

This annual data health brief documents the epidemiology of epinephrine administration for the treatment of life threatening allergic reactions or anaphylaxis in Massachusetts schools. The American Academy of Allergy, Asthma and Immunology defines anaphylaxis as a collection of symptoms affecting multiple systems in the body. Common signs and symptoms may be a combination of hives, swelling (of any body parts), stomach cramps, throat tightness or closing, difficulty breathing, faintness or loss of consciousness and others. The most dangerous symptoms include breathing difficulties and a drop in blood pressure or shock, which are potentially fatal. Common examples of potentially life-threatening allergies are those to food, stinging insects, medications, latex, environmental and others and reactions to those allergens may be mild, moderate, or severe. Epinephrine (adrenalin) is the first drug that should be used in the emergency management of an individual having a potentially life-threatening allergic reaction. It is recommended that epinephrine be given at the start of any reaction occurring in conjunction with exposure to a known or suspected allergen.¹

After administering epinephrine, all Massachusetts schools are required to complete a standard form, *Report of EpiPen[®] Administration*, and submit it to the Massachusetts Department of Public Health (MDPH), School Health Unit. Reporting of epinephrine administration in all public and nonpublic schools became mandatory in November 2003 under 105 CMR 210, the Regulations Governing the Administration of Prescription Medications in Public and Private Schools.

This annual data report demonstrates findings consistent with previous reports:

- **The majority of the epinephrine administrations were administered by school nurses (92%)**
- **The numbers of individuals who had a life threatening anaphylactic event without a previous allergy history remains high (25%)**

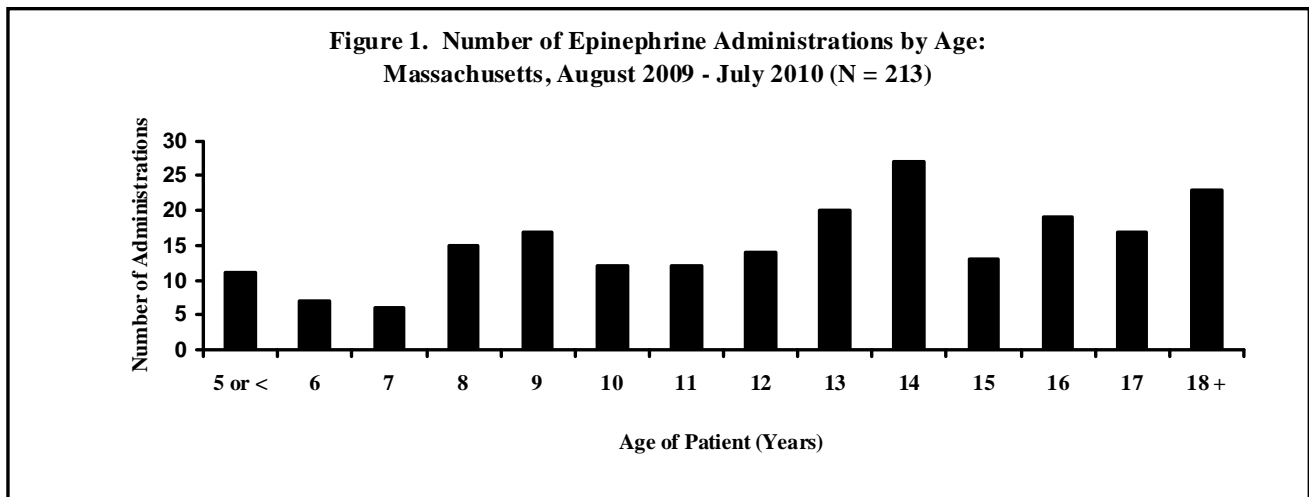
¹ Position Statement: Anaphylaxis in schools and other child-care settings, American Academy of Allergy, Asthma and Immunology, J Allergy Clinical Immunology 1998; Vol.102, No. 2 , 173-175.

During the 2009-2010 school year, 164 schools (156 public schools in 106 school districts, as well as 8 private schools in 7 cities and towns) reported 225 administrations of epinephrine for the treatment of allergic reactions in schools.

- All six regions of the state reported epinephrine administration. The MetroWest region reported the greatest number of administrations (31.7%), whereas the Boston region reported the fewest (4.0%).
- While most school districts reported only one administration of epinephrine, 40 public school districts reported more than one. Ten public school districts reported five or more epinephrine administrations during the school year.

Characteristics of Individuals Receiving Epinephrine

- Of the individuals receiving epinephrine, 198 (or 90%) were students; 20 (9%) were staff members; and 3 (1%) were visitors (the status of 4 was not reported). Figure 1 shows the age distribution of all individuals who received epinephrine.



Data Source: Report of EpiPen® Administration forms.. Age was not reported for 12 patients.

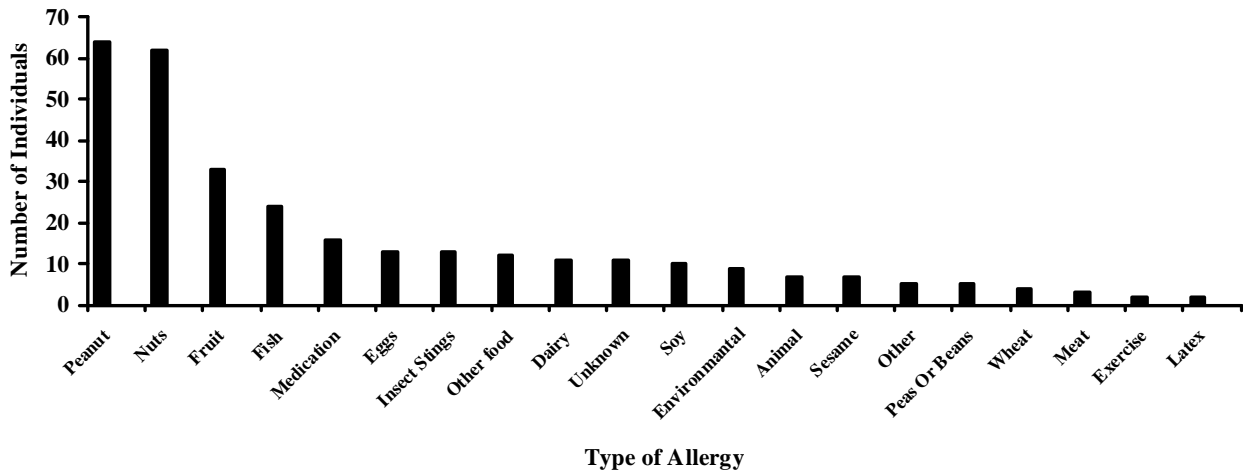
Of the 189 students who received epinephrine, 52% were female and 48% male.²

- The most frequently reported allergies were peanut and nut allergies (Figure 2).³

² The gender of 9 students was not reported.

³ Since those with multiple allergies reported more than one allergen, the total number of allergies reported is greater than the number of cases.

Figure 2. Most Common Types of Allergies Reported by Individuals Receiving Epinephrine in Schools: Massachusetts, August 2009 - July 2010 (N = 225)**



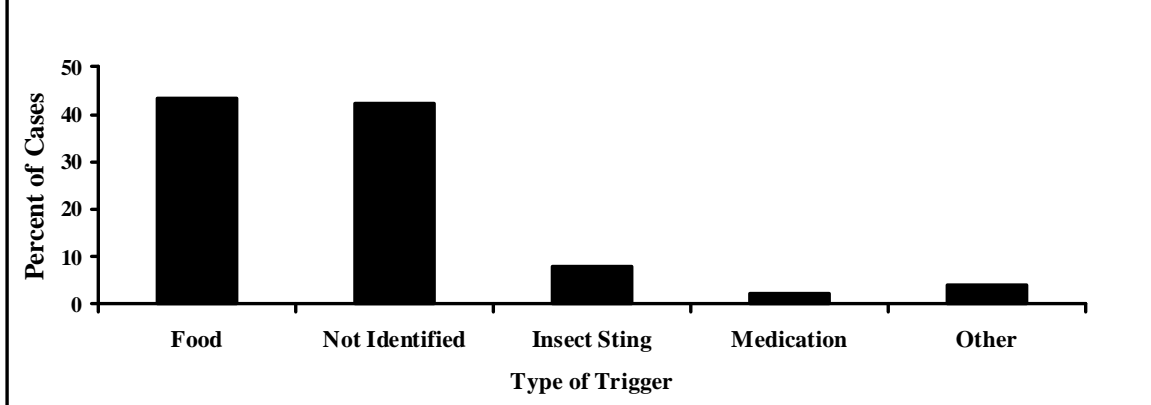
Data Source: Report of EpiPen Administration forms.

- 64 individuals receiving epinephrine (28%) reported having multiple allergies.
- In 57 cases (25%), the individual receiving epinephrine was not known to have an allergic condition at the time of the anaphylactic event. For these individuals, it was a first time event.

Characteristics of Allergic Reactions

- Food was believed to be the cause of 43% of the reactions (Figure 3).
- In 42% of the cases, the allergen that triggered the reaction was not identified (Figure 3) (both for first time events and those with previous known allergies).
- Reported symptoms involved multiple organ systems such as the skin, gastrointestinal, respiratory, cardiovascular, or neurological. In 79% of the cases the symptoms reported involved the respiratory tract, such as a tightness of the throat, wheezing, shortness of breath, or difficulty swallowing. A little over one-half of the cases (60 %) involved symptoms related to the skin such as hives, itchy skin or facial swelling. Gastrointestinal symptoms such as nausea or oral "tingling" were reported in 34% of the cases. Neurological symptoms such as "light headedness" or feelings of anxiety were reported in 11% of the cases, and cardiovascular symptoms such as tachycardia were reported in 4% of the cases.
- Symptoms most frequently developed in the classroom (45%). Other locations included the cafeteria (14%), health office (9%), playground/outside/recess (7%), the gymnasium (3%), and various other locations both inside and outside the school building. In 92% of the cases, epinephrine was administered in the health office.

Figure 3. Triggers of Allergic Reactions Reported by Individuals Receiving Epinephrine in Schools, Massachusetts, August 2009 - July 2010 (N=224)



Data Source: Report of EpiPen® Administration forms. In 1 case, the trigger was not reported.

- The majority of epinephrine administrations (92 %) were performed by the school registered nurse. In 3% of cases, epinephrine was administered by unlicensed personnel such as teachers, coaches, administrators and parents. All had been appropriately trained in the administration of epinephrine. Another 1% were administered by LPNs. In less than 1% of cases, epinephrine was administered by an Emergency Medical Technician.
- In 3% of the cases, students self-administered the epinephrine. The students who self-administered were between 10 and 18 years of age.
- After the development of symptoms, epinephrine was administered in 10 minutes or less 66% of the time (Range: 0 - 150 minutes).⁴

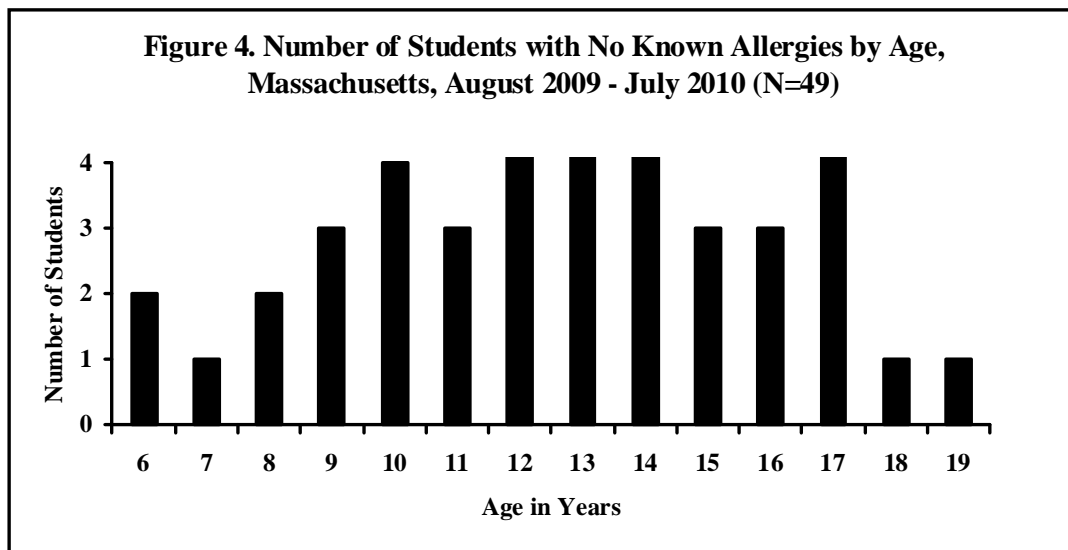
Reasons for delayed administration (>= 90 minutes):

- In all 3 cases, the student did not have a history of epinephrine use
- In 2 of the 3 cases, the student did not have a known allergy or a history of anaphylaxis
- Of those students with known allergies, 72% had an individualized health care plan (IHCP) in place.
- Of those students with known allergies, 52% had also been diagnosed with asthma.
- Five students were not transported to a medical facility via the Emergency Medical System.
 - In all five cases, the parent made the decision not to transport the student to the emergency room and took the student home. In two of these cases, the student had no known allergies.

⁴ This includes individuals with known and unknown allergic conditions.

Characteristics of Cases Involving Individuals without a Known Allergic Condition

- Fifty-seven cases (25%) involved individuals without a known allergic condition, and 49 of those involved students.
- In cases involving individuals without a known allergic condition:
 - The average age of students was 12.9 years, with a range of 6-19 years (Figure 4).
 - After the development of symptoms, epinephrine was administered in 10 minutes or less 51% of the time (compared to 69% of the time in cases involving a known allergic condition).



Data Source: Report of EpiPen Administration forms.

ONGOING RECOMMENDATIONS TO SCHOOLS

This report has been prepared as a performance improvement strategy to ensure high quality management of individuals with life threatening allergies in the school setting. Based on some of the findings, the following are ongoing recommendations and will be shared with all school nurses:

- Educate parents stressing the importance of sharing their children's information on known allergies with the school nurse and ensure that EpiPens[®] are available at the school.
- Ensure that all students with life threatening allergies have an individualized care plan.
- Recommend that school staff share any information on their own life threatening allergies with the school nurse to ensure a prompt emergency response should an unintended exposure occur.
- Ensure that all individuals who have experienced a life threatening allergic event are transported via an emergency medical vehicle to an emergency care facility. This

requires education of the parents/guardians, all school staff and emergency medical personnel about the potential for a repeat of the symptoms or a biphasic reaction.⁵

- Ensure that school policy and individual health care plans follow the American Academy of Allergy, Asthma and Immunology position statement that epinephrine is the first drug that should be used in the emergency management of a child having a potentially life threatening allergic reaction.⁶
- Implement the Massachusetts guidelines, *Managing Life Threatening Food Allergies in Schools*. www.doe.mass.edu/cnp/allergy.pdf

⁵ Biphasic reaction or secondary response is a recurrence of symptoms within 72 hours with no further exposure however a continued presence of antigens in the body.

⁶ Position Statement: Anaphylaxis in schools and other child-care settings, American Academy of Allergy, Asthma and Immunology, J Allergy Clinical Immunology 1998; Vol.102, No. 2 , 173-175.