



## **Clinical Conversations for the School Nurse**

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# **Food Allergy Management in the School Setting**

*National Association of School Nurses*

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# Clinical Conversations for the School Nurse

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## Food Allergy Management in the School Setting

### Introduction

The National Association of School Nurses, in the position document, *Allergy/Anaphylaxis Management in the School Setting*, states:

*It is the position of the National Association of School Nurses (NASN) that the safe and effective management of allergies and anaphylaxis in schools requires a collaborative, multidisciplinary team approach. The registered professional school nurse, is the leader in a comprehensive management approach which includes planning and coordination of care, educating staff, providing a safe environment, and ensuring prompt emergency response should exposure to a life-threatening allergen occur.*

As the school nurse assumes this vital leadership role in food allergy management in the school setting, questions and concerns can arise. As school nurses often practice in isolated situations, there is value in pursuing discussions or “clinical conversations” with colleagues in the school health profession. This guide will assist the school nurse in leading a meeting or workshop that is centered on recently published information related to food allergy management.

This guide has been developed to provide the school nurse with guided questions related to articles that have been recently published in school nursing literature. The following pages will provide the school nurse with information on how to use the articles to guide nursing conversations as well as facilitate a directed learning experience with fellow school nurses.

Our position document concludes with the following:

*The school nurse is the key school professional to lead the school staff in the awareness, prevention and treatment of life-threatening allergic reactions keeping students safe at school and ready to learn.*

This document is designed to assist school nurses in meeting this important goal.

*This Clinical Conversation resource was created through an unrestricted grant from Mylan Specialty.*

# Clinical Conversations for the School Nurse

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## Food Allergy Management in the School Setting

### How to Use this Guide

The Clinical Conversation Guide for Food Allergy Management in the School Setting provides the school nursing professional with access to recently published articles in the school health literature to provide a framework for leading a meeting with other school nurses or school health staff, a professional development workshop or an interactive nursing conference presentation based on prepared discussion questions.

Each selected article will be presented in the following format:



#### **Title Page of Article**

Reference for article (APA format)

Includes: Author information, Article abstract

Publisher's cover page with publication information



#### **Content Considerations**

Includes questions focused on the information and data included in the article



#### **Idea Implementation**

Includes questions related to the application of the information in the article and identification of potential actions for the school community



#### **Practice Points**

At the end of each section the following question will be posed: *"How will this change your practice?"*

In moving through the articles and questions the school nurse should allow for time for school health colleagues to thoughtfully answer questions with a strong focus on application in their individual practice of school nursing.

# Clinical Conversations for the School Nurse

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## Food Allergy Management in the School Setting

A compendium of articles to initiate discussion for school health professionals

- **The Case for Stock Epinephrine in Schools**  
Author: Nancy L. Gregory, Associate Director of Communications  
Food Allergy Research and Education
  
- **School Nurse's Role in Supporting Food Allergy Safe Schools**  
Author: Victoria Jackson, MSN, RN, NCSN  
School Health Program Administrator  
Illinois Department of Human Services
  
- **Creating a New Community of Support for Students with Food Allergies**  
Authors: Michael Pistiner, MD, MMSc  
Pediatric Allergist, Harvard Vanguard Medication Associates  
Instructor of Pediatrics, Boston Children's Hospital  
John Lee, MD  
Pediatric Allergist  
Instructor of Pediatrics, Boston Children's Hospital
  
- **Implementation of a Stock Epinephrine Protocol**  
Authors: Kathleen Vokits, BSN, RN, NCSN, School Nurse – Las Vegas, NV  
Irma Pumphrey, MEd, MS, BSN, RN, Nursing Supervisor – Las Vegas, NV  
DeAnn Baker, MEd, BSN, RN, School Nurse – Las Vegas, NV  
Karen Krametbauer, MEd, BSN, RN, School Nurse – Las Vegas, NV
  
- **Recognition and Treatment of Anaphylaxis in the School Setting: The Essential Role of the School Nurse**  
Authors: Sally Schoessler, MEd, BSN, RN  
NASN Director of Nursing Education  
Martha White, MD, CPI  
Research Director, Institute for Asthma and Allergy

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## Anaphylaxis Action – Clinical Conversation Topic



### Discussion Article

Article: **The Case for Stock Epinephrine in Schools**

Author: Nancy L. Gregory, Associate Director of Communications  
Food Allergy Research and Education

Gregory, N. (2012) The case for stock epinephrine in schools. *NASN School Nurse*, 27 (4), 222-225. doi: 10.1177/1942602X12449057

**Abstract:** A minority of states have legislation concerning non-student-specific epinephrine, or “stock” epinephrine, in schools. Stock epinephrine can be used in anaphylactic emergencies at schools for students who do not have epinephrine auto-injectors on campus. This is a potentially lifesaving measure that should be implemented in schools nationwide.

*Editor’s note – The availability of epinephrine in schools has increased since this article was first published. As of January 2014, five states now require schools to stock epinephrine, and 26 states have laws or guidelines allowing schools to stock non student-specific epinephrine.*

Gregory, Nancy L., *The Case for Stock Epinephrine in Schools*, 27(4). Pp. 222-225. Copyright 2012 by National Association of School Nurses, Reprinted by Permission of SAGE Publications, Inc.

# NASN School Nurse

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## **The Case for Stock Epinephrine in Schools**

Nancy L. Gregory

*NASN School Nurse* 2012 27: 222

DOI: 10.1177/1942602X12449057

The online version of this article can be found at:

<http://nas.sagepub.com/content/27/4/222>

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# The Case for Stock Epinephrine in Schools

Nancy L. Gregory

*A minority of states have legislation concerning non-student-specific epinephrine, or “stock” epinephrine, in schools. Stock epinephrine can be used in anaphylactic emergencies at schools for students who do not have epinephrine auto-injectors on campus. This is a potentially lifesaving measure that should be implemented in schools nationwide.*

**Keywords:** stock epinephrine; schools; school nurse; anaphylaxis

The well-documented increase in the prevalence of food allergies among children in the United States, with an estimated 8% of children (Gupta et al., 2011) now affected, has brought additional challenges to school staff and, in particular, school nurses. Two highly publicized cases of fatal anaphylaxis at schools in a span of 13 months have brought heightened attention to school food allergy management and, specifically, to the case for stock epinephrine in schools. Nearly 6 million children have food allergies, and nearly 40% (Gupta et al.) of those children have a history of severe reactions including anaphylaxis, a serious reaction that is rapid in onset and may cause death. Schools must be prepared to handle allergic reactions that require epinephrine, the first-line treatment for anaphylaxis. In an effort to protect students, not only those who are at risk for anaphylaxis but those who are potentially at risk due to undiagnosed

food allergies, there is a nationwide effort to equip schools with non-student-specific epinephrine, also known as “stock” epinephrine.

The attention to the need for such legislation in recent months can be associated to a community response to the aforementioned fatalities. Neither child had epinephrine at school. Stock epinephrine protocols allow schools to promptly administer lifesaving medication, prescribed by a physician for the school, to students who do not have an epinephrine auto-injector at school. It would also be available in cases in which a prescribed epinephrine auto-injector is used but malfunctions or cases in which a second dose is needed before emergency responders arrive.

Approximately 20 to 25% of epinephrine administrations in schools involve individuals whose allergy was unknown at the time of the reaction (McIntyre, Sheetz, Carroll, & Young, 2005). The School Access to Emergency Epinephrine Act was introduced in the U.S. Senate in November 2011, followed by its introduction in the U.S. House of Representatives in December 2011. This legislation encourages states to adopt laws requiring schools to have stock epinephrine auto-injectors so treatment can be promptly administered in an anaphylactic emergency. The bill has received widespread support—it is endorsed by NASN; the American Academy of Pediatrics; the

American College of Allergy, Asthma & Immunology; the American Academy of Allergy, Asthma & Immunology; the American Academy of Emergency Medicine; the National Association of Elementary School Principals; and the Food Allergy Initiative. The Food Allergy & Anaphylaxis Network has been spearheading efforts to pass the bill. On average, it will cost a school just over \$100 to purchase two epinephrine auto-injectors annually (with consideration of expiration dates and the need to stock a junior strength in elementary/early childhood schools) to prevent a fatality from anaphylaxis. (Please see the information box at conclusion.)

As of March 2012, this federal bill was still pending. At least seven states already have laws in place that allow for this practice, while at least six other states have legislation pending that makes this practice either mandatory or voluntary. While the language of the legislation is varied among those states with stock epinephrine laws in place, the overall purpose—to allow schools to keep an epinephrine auto-injector on campus—is the same. Usually, stock epinephrine state legislation provides that anyone who administers epinephrine in good faith shall not be liable for civil damages.

In March 2012, the Virginia House of Delegates and Senate passed a stock epinephrine law, to be known as “Amarria’s Law” after 7-year-old Amarria Denise Johnson, who died January 2,



2012, after experiencing an anaphylactic reaction at school. The bill was signed by Gov. Bob McDonnell on April 26, 2012, during a ceremony at Binford Middle School in Richmond.

Implementation of stock epinephrine laws helps ensure that students who experience an anaphylactic reaction at schools receive medical treatment immediately, which is key in such reactions. Studies of fatal food-induced anaphylaxis cases have shown that a delay in treatment was a critical factor (Bock, Muñoz-Furlong, & Sampson, 2007). Sicherer and Simons (2007) noted that while those who must evaluate symptoms to decide whether to use epinephrine may be anxious to do so, they should always be instructed to administer the medication instead of taking the risk of waiting too long. Antihistamines and asthma medication cannot reverse the symptoms of anaphylaxis.

Hesitation to use epinephrine can be attributed to erroneously thinking a reaction is mild or to being overly concerned about harmful effects of epinephrine. Epinephrine's side effects, such as anxiety and palpitations, are not harmful for the average, healthy child.

An epinephrine auto-injector is relatively simple to use—children as young as 8 are able to learn how to self-administer their own epinephrine auto-injectors. The devices are accompanied by an auto-injector trainer that can be used to instruct an entire school staff on proper usage. Additionally, manufacturers of the devices have educational materials that can be viewed online or even downloaded as an app to a mobile device.

Food allergy management in schools has evolved in recent years. With the passage of the Food Allergy and Anaphylaxis Management Act (FAAMA), signed by President Obama in January 2011, it is expected that more schools and school districts will implement comprehensive plans to keep students with food allergies safe. FAAMA requires the U.S. Secretary of Health and Human Services to develop and make available a voluntary policy to manage the risk of

food allergy and anaphylaxis in schools. These federal guidelines, expected to be released in the late Spring of 2012, are likely to include support for stock epinephrine in schools. While there are few studies focusing on allergic reactions in schools, the available data show that more than 15% of school-age children with food allergies have had a reaction in school (Nowak-Węgrzyn, Conover-Walker, & Wood, 2001; Sicherer, Furlong, DeSimone, & Sampson, 2001).

### Snapshots From Other States

In their study evaluating the incidence of anaphylaxis in Massachusetts schools, McIntyre et al. (2005) reported that 19% of the cases in which epinephrine was administered were reactions that occurred outside the school building (e.g., the playground, traveling to and from school, or field trips). In 24% of the cases, the life-threatening allergy was not known to school staff. The authors concluded that while anaphylactic reactions are not frequent in schools, they are not uncommon events either.

School nurses currently play a vital role in the management of a student's food allergy at school. In addition, school staff such as teachers, food service employees, bus drivers, and other staff in contact with the student should also be made aware of students with known allergies and be informed and trained on emergency situations. As stock epinephrine laws go into effect, school nurses will play a critical implementation role. It will become crucial to have school nurse involvement in training others to use the stock epinephrine devices and school nurse management of stock epinephrine in the school building.

The state of Nebraska was at the forefront of addressing anaphylaxis and asthma issues. The state required every school to adopt an emergency-response protocol for anaphylaxis and asthma that includes the administration of lifesaving medication. In addition, every school was required to have an emergency response program in place by the end of the 2003-2004 school year (Murphy et al., 2006).

Before this program was implemented statewide, Murphy et al. (2006) evaluated

the protocol in 78 schools in Omaha from 1998 to 2003. School nurses recorded data each time the protocol was used, noting whether the student had an asthma action plan, a metered-dose inhaler, or neither. In cases where students experienced anaphylaxis, the school nurses recorded whether the student had epinephrine available at the school. None of the students in the five recorded anaphylaxis cases had epinephrine at school. Approximately 36% of the students treated with epinephrine, albuterol, or a combination of both did not have action plans or inhalers at school. Researchers in Nebraska (Murphy et al.) noted that the implementation of this protocol has resulted in increased awareness of the prevention and treatment of anaphylaxis among school staff and teachers.

In California, where school districts already are allowed to stock emergency epinephrine, it appears that the majority of schools do not have this lifesaving medication available for students other than those who have a prescription. In their study, Morris, Baker, Belot, and Edwards (2011) surveyed California school nurses to learn more about school preparedness for anaphylaxis. Just 13% of nurses who responded to the survey said their school had stock epinephrine. Interestingly, 30% said they had used one student's prescribed medication on another student in need of treatment. Among the reasons listed for not having stock epinephrine were lack of guidelines, limited availability of school nurses, lack of funding for training and medication, and lack of education (Morris et al.). The California Department of Education has posted comprehensive training standards to assist in safe implementation available at the following website: <http://www.cde.ca.gov/ls/he/hn/epiadmin.asp>.

In Illinois, where a stock epinephrine bill was recently enacted, schools are in the implementation phase. A limitation of the law is that it simply allows rather than mandates schools to have stock epinephrine. Virginia's law has a different twist. It requires local school boards to adopt and implement policies

for the possession and administration of epinephrine in every school and allows the school nurse or other school employees to administer the medication to any student believed to be having an anaphylactic reaction.

In Ontario, Canada, Sabrina's Law requires school boards to establish anaphylaxis policies that provide for annual anaphylaxis training for school staff and permits the use of epinephrine for students whose allergy was unknown. The law is named in honor of Sabrina Shannon, who died of an anaphylactic reaction that occurred during her first year of high school in 2003. In their study comparing anaphylaxis management in schools with and without food allergy management legislation, Cicutto et al. (2012) found that school personnel in districts where anaphylaxis management is legislated had better epinephrine auto-injector technique. But they also found that school policies in regions that had anaphylaxis legislation in place were lacking in the areas of allowing epinephrine administration to individuals without prior consent and granting legal immunity in cases of good faith.

## Conclusion

Epinephrine can be used not only for a student who is experiencing food-induced anaphylaxis but for students who are allergic to insect stings. It is the only medication that can reverse the symptoms of anaphylaxis, which can progress quickly. Seconds count when it comes to treating anaphylaxis, and schools nationwide should be equipped with epinephrine auto-injectors that can immediately be used to treat a student while waiting for emergency responders. Disparities across the nation are the

impetus for the federal legislation. The School Access to Emergency Epinephrine Act, if enacted, will encourage all states to create or revise their laws on administration of epinephrine to include provisions as follows:

- Requiring public elementary and secondary schools to maintain a supply of epinephrine that has been prescribed by a licensed physician;
- Permitting school personnel trained in the appropriate use of epinephrine to administer to a student for the treatment of anaphylaxis; and
- Ensuring school employees are not liable for negligence in administering epinephrine to any student believed to be having an anaphylactic reaction.

Stock epinephrine laws nationwide will enable school nurses to treat anaphylactic emergencies promptly, and could potentially save lives. ■

Discounted epinephrine auto-injectors for stock use are available through the Dey EpiPen School Discount Program. More information is available at [www.bioridgepharma.com/programs.html](http://www.bioridgepharma.com/programs.html)

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Nancy Gregory has been a writer and editor at The Food Allergy & Anaphylaxis Network since 2008.

## Anaphylaxis Action – Clinical Conversation Topic

### The Case for Stock Epinephrine in Schools



#### Content Considerations

1. It has been reported that we're seeing an increase in the prevalence of children with food allergies – what is the percentage of children we're likely to see with a diagnosed food allergy?
2. What percentage of students received epinephrine in school that were not previously diagnosed with a food allergy?
3. What is the aim of the legislation that requires a school to have stock epinephrine available?
4. Who are the critical stakeholders in the school setting in the management of food allergies?
5. How do some of the state laws differ in their approach to stock epinephrine laws?
6. According to this article, what are the three focus points of national legislation when it comes to stock epinephrine? Is this significant when examining the potential to save lives?

## Anaphylaxis Action – Clinical Conversation Topic

### The Case for Stock Epinephrine in Schools



#### Idea Implementation

7. As stated earlier, we're seeing an increase in the prevalence of children with food allergies and with that estimate of nearly 8% of children being affected, how many children are you likely to see with a food allergy in a class of 30 children? In a school of 500 children? In a school of 2000 children? In your own school?
  
  8. Epinephrine must be given without delay. What are some of the common reasons that epinephrine administration might be delayed?
  
  9. What do you see as the role of the school nurse in:
    - a. Epinephrine administration?
    - b. Staff awareness and education?
  
  10. How can school nurses work together to reduce the disparities in the availability of stock epinephrine to all students?
- 



#### Practice Point

How can the information in this article shape and change your practice of school nursing?

## Anaphylaxis Action – Clinical Conversation Topic



### Discussion Article

Article: **School Nurse's Role in Supporting Food Allergy Safe Schools**

Author: Victoria Jackson, MSN, RN, NCSN  
School Health Program Administrator  
Illinois Department of Human Services

Jackson, V. (2013) School nurse's role in supporting food allergy safe schools. *NASN School Nurse*, 28 (2), 76-77. doi: 10.1177/1942602X13477456

**Abstract:** Food allergy is a serious, potentially life-threatening condition. School nurses have a responsibility to assure that all students with food allergy have an emergency action plan in place, that staff are educated to assist students in providing emergency care when needed and in avoiding exposure to allergens, and that steps are taken to make their school an allergy safe environment. Secure a copy of your state's Food Allergy Guidelines and lead in making your school a food allergy safe environment.

Jackson, Victoria, *School Nurse's Role in Supporting Food Allergy Safe Schools*, 28(2). Pp. 76-77. Copyright 2013 by National Association of School Nurses, Reprinted by Permission of SAGE Publications Inc.

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## School Nurse's Role in Supporting Food Allergy Safe Schools

Victoria Jackson

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# School Nurse's Role in Supporting Food Allergy Safe Schools

Victoria Jackson, RN, MSN, NCSN

**Keywords:** epinephrine; delegated care aide; food allergy; anaphylaxis

Management of severe food allergies continues to be a top school nurse priority. According to Gupta et al. (2011), 8% of all children have a food allergy, and during the 10-year period from 1997 to 2007, the prevalence of food allergy increased by 18% in school-age children (Branum & Lukacs, 2008). Children with food allergy have a higher incidence of asthma (29%), eczema or skin allergy (27%), and respiratory allergy (30%) than children without food allergy (Branum & Lukacs, 2008). While the incidence of food allergy is lower in Hispanic children than in white or black children, incidence does not differ by sex. As many as 18% of children with food allergy have reactions due to foods accidentally ingested at school (Branum & Lukacs, 2008). Children without a previous diagnosis of food allergy account for 25% of reactions requiring epinephrine in schools (McIntyre, Sheetz, Carroll, & Young, 2005). It is important that school nurses have necessary policies and procedures in place to educate staff on emergency response to allergy symptoms and anaphylaxis and measures to be taken to reduce exposure to allergens in the school environment. This article is provided to emphasize the need for school nurses to keep abreast of the

changing laws, both state and national, local policies, and emerging research related to allergies in the school-age child. This article also serves as a general overview of food allergy management strategies, including education of school staff. School nurses are well positioned to carry out both objectives, particularly in states that have adopted laws or guidelines on management of food allergies.

Symptoms of food allergy can be mild with slow onset or sudden and severe and can include one or more of the following:

- hives
- tingling around the mouth
- swelling of the tongue and throat
- difficulty breathing
- coughing or wheezing
- hoarse voice
- dizziness
- abdominal cramps
- vomiting or diarrhea
- eczema or rash
- loss of consciousness

Anaphylaxis, a sudden, severe allergic reaction that can involve more than one body system, can cause difficulty breathing, upper airway constriction, cardiovascular compromise, neurologic changes, or gastrointestinal symptoms and can result in death. Fatalities most frequently occur in children with

allergies to peanuts, tree nuts, and milk and those with underlying asthma (Sicherer & Mahr, 2010). Failure to promptly administer epinephrine during a severe allergic reaction increases risk of death.

Each child with known food allergy should have an individual emergency action plan developed and shared with school staff. The plan should outline specifics about the food allergy including foods to avoid, symptoms and treatment, and emergency contact information. The immediate availability of the epinephrine varies from state to state and district to district, in some cases allowing the student to carry and self-administer the epinephrine auto-injector, with a backup supply stored in the health office. Epinephrine dosing is dependent on the child's weight with auto-injectors available in 0.3 and 0.15 mg strengths. Children experiencing anaphylaxis may have initial improvement in symptoms after receiving a dose of epinephrine and have symptoms reoccur later. Thus, it is **essential** that any child who experiences an anaphylactic reaction be transported by ambulance to the emergency department for further observation and care. Lay staff should receive training in how to recognize symptoms of allergic reaction and administer the epinephrine auto-injector and how to activate emergency

medical services. The National Association of School Nurses and the American Academy of Allergy, Asthma & Immunology websites offer a variety of resources for use in staff education (see resources listed at the end of the article).

There is no cure for food allergy. Emphasis must be placed on avoiding foods that trigger a reaction and prompt intervention. Allergens can be found throughout the school. High-risk situations/locations include the classroom; the cafeteria; arts, crafts, and science projects; bus transportation; fundraisers; parties and holiday celebrations; and classroom rewards that involve foods and other products that may contain hidden ingredients. Staff must be educated to read labels to identify potential allergens, avoid having foods or materials containing allergens in the classroom, properly clean surfaces, and allow students to wash hands before and after eating and throughout the day with soap and water or hand wipes. Several states have developed documents outlining specific guidelines for managing food allergies in the school setting. Links to state guidelines can be found at [http://www.nasn.org/portals/0/resources/faat\\_state\\_guidelines.doc](http://www.nasn.org/portals/0/resources/faat_state_guidelines.doc).

Federal legislation including Section 504 of the Rehabilitation Act of 1973, U.S. Department of Agriculture regulations for school nutrition programs, the Americans with Disabilities Act Amendments Act of 2008, and the Individuals with Disabilities Education Act require that accommodations be made for students in regular or special education who have food allergies to assure that a plan is in place to eliminate exposure to allergens and appropriate emergency care is provided when necessary. All students with severe, life-threatening food allergy should have an individual health care plan and be considered for a Section 504 plan or Individualized Education Program, if the student qualifies for special education.

Many states have passed legislation related to management of food allergy at school. Such legislation provides structure to allow the development of written guidelines for management of food allergies and *may* include language related to the following:

- allowing students to carry and self-administer epinephrine auto-injector
- requirements for physician order and parent permission for emergency response to anaphylaxis
- granting teachers and other non-nursing staff the right to administer epinephrine via auto-injector where allowed by law, and establishing parameters for training
- providing protection from liability for those who provide emergency care except in cases of willful or wanton misconduct
- giving schools authority to maintain a stock supply of epinephrine auto-injectors to use in an emergency
- establishing policies related to allergen-free snacks and cleaning of surfaces and other means of reducing exposure to allergens
- creating standing orders allowing licensed school nurses (registered nurse) to administer epinephrine to those experiencing anaphylaxis without a prior diagnosis of allergy

For example, the Illinois Statutes can be found at the following links:

- Emergency Epinephrine Act: <http://www.ilga.gov/legislation/publicacts/fulltext.asp?Name=097-0361>
- Establishing Food Allergy Guidelines: <http://www.ilga.gov/legislation/publicacts/96/096-0349.htm>

Your state school nurse consultant(s) can provide information on similar initiatives in your state. Contact information can be found at <http://www.nassnc.org/files/MemberList2010.pdf>.

Food allergy is a serious, potentially life-threatening condition. School nurses have a responsibility to assure that all students with food allergy have an emergency action plan in place, that staff are educated to assist students in providing emergency care when needed and in avoiding exposure to allergens, and that steps are taken to make their school an allergy safe environment. Secure a copy of your state's Food Allergy Guidelines and lead in making your school a food allergy safe environment. ■

## Resources

American Academy of Allergy, Asthma & Immunology website offers educational materials, forms, and other valuable resources. <http://www.aaaai.org/home.aspx>

Food Allergy and Anaphylaxis: An NASN Tool Kit. <http://www.nasn.org/ToolsResources/FoodAllergyandAnaphylaxis>

Guidelines for Managing Life-Threatening Food Allergies in Illinois Schools. [http://www.isbe.net/nutrition/pdf/food\\_allergy\\_guidelines.pdf](http://www.isbe.net/nutrition/pdf/food_allergy_guidelines.pdf)

Sample emergency action plan. <http://www.aaaai.org/Aaaai/media/MediaLibrary/PDF%20Documents/Libraries/Anaphylaxis-Emergency-Action-Plan.pdf>

Manufacturer's website with educational materials and video showing how to use an epinephrine auto-injector. [http://www.epipen.ca/en/about\\_epipen/how\\_to\\_use\\_epipen/](http://www.epipen.ca/en/about_epipen/how_to_use_epipen/); <https://www.auvi-q.com/> (to be available soon)

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# Anaphylaxis Action – Clinical Conversation Topic

## School Nurse's Role in Supporting Food Allergy Safe Schools



### Content Considerations

1. Children with food allergy have an increased prevalence of which of the following health issues?
  - a. Asthma
  - b. Respiratory Allergy
  - c. Eczema
  - d. All of the above.
2. Which of the following ethnicities experience a lower incidence of food allergies?
  - a. White children
  - b. Hispanic children
  - c. Black children
3. Which allergies cause the most fatalities?
4. What should each student with a known food allergy have that should be distributed to school staff?
5. Why is it essential that every child who experiences an anaphylactic reaction be transported to the hospital by ambulance?
6. Being that there is no known cure for food allergies, emphasis must be placed on what two areas when dealing with food allergies in the school setting?

## Anaphylaxis Action – Clinical Conversation Topic

### School Nurse's Role in Supporting Food Allergy Safe Schools



#### Idea Implementation

7. Allergens can be found throughout the school. What are some high risk situations / locations in your school?
  8. The school nurse is the leader in care in the school setting. What are the important points that the school nurse must cover when educating school staff about food allergy management?
  9. What are some of the components that you may see in written guidelines for food allergy management?
  10. Does your state have food allergy written guidance? Where might you find resources to assist you in food allergy management in your school?
- 



#### Practice Point

How can the information in this article shape and change your practice of school nursing?

## Anaphylaxis Action – Clinical Conversation Topic



### Discussion Article

Article: **Creating a New Community of Support for Students with Food Allergies**

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Pistiner, M. & Lee, J. (2012) Creating a new community of support for students with food allergies. *NASN School Nurse*, 27 (5), 260-266. doi: 10.1177/1942602X12455247

**Abstract:** Managing food allergies in schools is a necessary but complex task. Breakdowns in implementation of school policies have resulted in devastating consequences and can create a divided school community. School nurses play the central role in the food allergy education of staff, parents and students. An educated school community can then be united in supporting children with food allergies. A thoughtful approach that takes these different members of the school community into consideration is essential to put a successful food allergy policy into action. This article outlines issues to consider when educating each specific group as well as discussing the challenges that can hamper school community-wide education and their potential solutions. The ultimate goal of food allergy management education is to create a community of support and to create a self-sustaining environment of understanding and awareness that may save time, decrease divisiveness, and even save a life.

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## Creating a New Community of Support for Students With Food Allergies

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# Creating a New Community of Support for Students With Food Allergies

Michael Pistiner, MD, MMSc

John J. Lee, MD

*Managing food allergies in schools is a necessary but complex task. Breakdowns in implementation of school policies have resulted in devastating consequences and can create a divided school community. School nurses play the central role in the food allergy education of staff, parents and students. An educated school community can then be united in supporting children with food allergies. A thoughtful approach that takes these different members of the school community into consideration is essential to put a successful food allergy policy into action. This article outlines issues to consider when educating each specific group as well as discussing the challenges that can hamper school community-wide education and their potential solutions. The ultimate goal of food allergy management education is to create a community of support and to create a self-sustaining environment of understanding and awareness that may save time, decrease divisiveness, and even save a life.*

**Keywords:** food allergy; anaphylaxis; staff training; educated school community

## Introduction

Imagine the unimaginable. One of your food-allergic students is dropped off at school and never returns home.

Despite increased food allergy awareness, deaths from food-related anaphylaxis still occur in U.S. schools. Emotions can run high, captured by images in the media of parents picketing in front of a school and press conferences with lawyers. Some schools have experienced issues of divisiveness that have negatively impacted their communities. Fortunately, most schools will not have experienced a fatal or near-fatal reaction and most will not have to deal with a divided community, but it is safe to say that almost all will encounter children with food allergies. Food allergies are estimated to affect about 4% of U.S. children (Branum & Lukacs, 2009). Approximately 25% of severe allergic reactions in Massachusetts schools that required epinephrine occurred in people without a known history of allergies (Massachusetts Department of Public Health, 2010; McIntyre, Sheetz, Carroll, & Young, 2005). First-time allergic reactions occur in schools, reinforcing the need for the entire school community to be prepared.

## Ongoing Issues and Challenges

Debates have raged on the extent of school policy and interventions needed to minimize risk of exposures to a child with food allergies. The details of strategies for food allergy management are beyond the scope of this article and are more adequately addressed in state

and federal guidelines, Safe at School and Ready to Learn: a comprehensive policy guide for protecting students with life-threatening food allergies (NSBA, 2012), school nursing resources ([www.nasn.org](http://www.nasn.org)), as well as recent scientific articles including the Management of Food Allergies in Schools: A Perspective for Allergists (Young, Muñoz-Furlong, & Sicherer, 2009). Unlike managing other medical conditions in school, food allergy interventions may impact other children and school staff. Schools can be polarized because of differing opinions about food allergy management (Greenhawt, Green, Pistiner, & Mitchell, 2011). Ill will surrounding this issue can also enter into classrooms and may contribute to incidents of bullying that target food-allergic students with potentially catastrophic physical and psychological consequences. The divisiveness that can occur in schools shows that further increased awareness is needed among staff, parents, and students. It is critical that education take place within the proper format and is delivered in the appropriate manner.

## Steps in the Right Direction

Fortunately, the issue of food allergies in school has received increased attention. Many states have created and implemented guidance documents, and national guidelines are due out later this

year. These comprehensive documents have been created to help guide school policy to assist with daily management of children's food allergies. Additionally there have been legislative initiatives regarding the provision of stock epinephrine in schools and standing orders for the treatment of anaphylaxis in students. These are steps in the right direction that highlight the absolute need for school nurses to champion the management of food allergies in schools and to efficiently implement these recommendations.

### **Educating Others About Food Allergy: A Time-Consuming Responsibility**

At times it may feel that food allergy management is a full-time job. Food allergy management in the school setting is indeed complex and can be time consuming. Education is a major component of management. Educating your school communities can be a challenge for you as there are limited time and resources as well as competing responsibilities. School nurses are encouraged to consider an increased focus on education, especially at the beginning of each year. Once this challenge is met, the entire community can be drawn into a partnership to create a continuing culture of food allergy support.

### **Awareness Can Bridge the Divide**

Food allergy management (prevention strategies and emergency preparedness) is necessary at all times and in all settings. This need for constant management makes it necessary for children with food allergies to do things a bit differently than children without food allergies. School-wide education may go a long way in keeping school communities from becoming divided over food allergy issues. Awareness and education is key for everybody, because managing food allergies cannot be the sole responsibility of the child or his or her parents. Therefore, it requires understanding and effort on the part of the entire school community including administration, staff, parents, and classmates.

## **Your School Community**

- All **school staff** who have interactions with children with food allergies should have a solid understanding of the signs and symptoms of anaphylaxis as well as food allergy management. This includes but is not limited to teachers, substitutes, specialists, aides, coaches, counselors, administrators, program coordinators, volunteers, bus drivers, custodians, and nutrition service workers. The staff should be trained by a school nurse on how to prevent allergic reactions from occurring, recognize allergic reactions when they do occur, respond to an allergic reaction, and potentially administer the appropriate emergency medicine. All staff should know their role in the school's emergency plan and be familiar with a food allergy emergency care plan (see Food Allergy & Anaphylaxis Network, Food Allergy Action Plan). Some staff will require additional information relevant to their role (e.g., nutritional services). Also, it is very important to train delegates who can administer an epinephrine auto-injector to a student with a known allergy (according to local, state, and federal policies and regulations) in the event that a school nurse is unavailable. Make sure those who receive training on the administration of epinephrine auto-injectors and are responsible for the treatment of anaphylaxis when the nurse is unavailable understand the entire emergency care plan for the children for whom they are responsible (Massachusetts Department of Education, 2002; NSBA, 2012).

The consequences of a lack of buy-in from staff can be catastrophic from a practical and safety standpoint because they interact closely with the parents. If staff members do not have understanding, they will not be able to communicate this in an effective way, and resentment might fester and grow. All school staff can act as your eyes and ears and are the ones responsible

for the majority of food allergy management during the school day. Nurses and staff together can help explain policies and help establish classroom rules and policies and monitor for bullying. Table 1 provides the school nurse with education content specific to the audience.

- School nurses can teach the **parents of students with food allergies** about the real risks of exposure to allergens and allergic reactions and create reasonable expectations about accommodations that address prevention and preparedness. The nurse can teach the parent what is covered under your school's established policy or state and national guidelines, including Section 504 eligibility. It is also helpful to use food allergy educational resources and enlist the assistance of school nurse leadership and/or the child's healthcare provider when a child's needs are not being met. Emphasize to parents the need to notify the school of any food allergy diagnosis and supply necessary medication and documentation (see Table 1).
- Provide education to the **parents of non-food allergic children**. When parents don't understand why certain school policies exist, they may not comply and may even feel resentful. Education is vital to bridge and prevent the potential divide between the families with and without food allergies. Teaching the basics can increase their acceptance and compliance of policies, which may help ensure the health and well-being of students (Gupta et al., 2008; Gupta et al., 2009). These parents will also serve as educators to their children, hopefully passing on an awareness that can support understanding rather than lead to isolation. This can be accomplished through Parent-Teacher Organizations, parent mailings, orientations, one-on-one meetings, and so forth (see Table 1; NSBA, 2012). Also, once they are comfortable with food allergy management strategies, they can be sources of additional support to the parents of

**Table 1.** School Food Allergy Education Content: Target Your Audience

	Basic Facts/School Rules	Prevention	Preparedness	Social/Emotional
Students: elementary school	<ul style="list-style-type: none"> <li>• Food allergies need to be taken seriously</li> <li>• Children with food allergies need to do things a bit differently</li> <li>• Discuss common symptoms</li> <li>• Review classroom and school food allergy rules</li> </ul>	<ul style="list-style-type: none"> <li>• “If you can’t read it don’t eat it”</li> <li>• Importance of reading labels</li> <li>• No sharing of food</li> <li>• Hand washing</li> <li>• “No thank you”</li> <li>• General concept of cross contact</li> </ul>	<ul style="list-style-type: none"> <li>• Report exposures</li> <li>• Get help for allergic symptoms</li> <li>• Introduction to emergency medicine/epinephrine</li> </ul>	<ul style="list-style-type: none"> <li>• Share your feelings</li> <li>• Tell your friends about your allergies</li> <li>• Support your friends with food allergies</li> <li>• Never bully</li> <li>• Take care of each other</li> </ul>
Students: middle and high school	<ul style="list-style-type: none"> <li>• More in-depth and developmentally targeted version of the above</li> <li>• Reinforce the importance of compliance with rules</li> <li>• Gentle discussion of allergy-related deaths and risk-taking behavior</li> </ul>	<ul style="list-style-type: none"> <li>• As above</li> <li>• Routes of exposure and associated risks</li> <li>• Reading labels</li> <li>• Labeling laws and their pitfalls</li> <li>• Hidden ingredients</li> <li>• Sources and prevention of cross contact</li> </ul>	<ul style="list-style-type: none"> <li>• As above</li> <li>• Recognizing anaphylaxis</li> <li>• Familiarity with steps to administer epinephrine auto-injector</li> <li>• Contacting emergency medical services for anaphylaxis</li> </ul> <p>* Present in developmentally and age-appropriate fashion</p>	<ul style="list-style-type: none"> <li>• More in-depth and developmentally targeted version of the above</li> <li>• No tolerance for bullying</li> <li>• Social and emotional impact of food allergies</li> <li>• Dating/kissing</li> <li>• Consider danger of alcohol (impaired judgment)</li> </ul>
Parents: Non–food allergic and food allergic	<ul style="list-style-type: none"> <li>• As above</li> <li>• More in-depth and developmentally targeted version of the above</li> <li>• Reinforce and support school policies based on facts</li> </ul>	<ul style="list-style-type: none"> <li>• As above</li> <li>• Specific discussion as related to classroom and school policies and in case of hosting a party or playdate</li> <li>• Communicate with family</li> </ul>	<ul style="list-style-type: none"> <li>• As above</li> <li>• Discussion related to drop-off parties and playdates</li> </ul> <p>* Optional: train on how to administer epinephrine</p>	<ul style="list-style-type: none"> <li>• As above</li> <li>• Encourage supportive environment</li> <li>• Encourage positive communication</li> <li>• Encourage parents to discuss being supportive with their children</li> </ul>
School staff	<ul style="list-style-type: none"> <li>• As above</li> <li>• Specific and general role in allergy prevention and emergency plan</li> <li>• Frank discussion of allergy-related deaths</li> <li>• Recognition of first-time allergic reactions</li> </ul>	<ul style="list-style-type: none"> <li>• As above</li> <li>• Prevention in different school settings (field trips, classroom, cafeteria, school bus, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• As above</li> <li>• Train on how to administer epinephrine auto-injector</li> <li>• Comfort with food allergy emergency care plan</li> </ul> <p>* For delegates: demonstrate competency in recognition of anaphylaxis and use of auto-injector (refer to your school policy)</p>	<ul style="list-style-type: none"> <li>• As above</li> <li>• Foster empathetic environment</li> <li>• Maintain confidentiality</li> </ul>

Note: See NSBA, Federal, State, and/or local guidelines/guidance documents for specific and more detailed recommendations on content of training. For school community training modules created by the authors, please see <http://Schools.AllergyHome.org>.



**Table 2.** Barriers to School Community–Wide Food Allergy Education: Challenges and Potential Solutions

Challenges	Specifics	Potential Solutions
<ul style="list-style-type: none"> <li>• Little time allocated to food allergy education of others</li> <li>• Differing models of school nurse coverage</li> </ul>	<ul style="list-style-type: none"> <li>• Many school nurses are only given short periods of time with staff, parents, and students (limited by busy staff development schedules, orientation schedules, and curriculum requirements).</li> <li>• Often there is limited time in a school nurse’s day to meet with staff, parents, and students.</li> </ul>	<ul style="list-style-type: none"> <li>• Be aware of state regulations and guidance related to training of school staff members. The school nurse is required to be the trainer in many states, and it is recommended that the school nurse always be the professional to provide medication administration and other healthcare related training.</li> <li>• Use teaching tools.</li> <li>• Maximize the time you do have (e.g., group versus individual training when appropriate).</li> <li>• Discuss time needs with administration, request substitute coverage for training. If possible, reference specific time allotment cited by policy recommendations and guidelines.</li> <li>• Use food allergy management and education as a platform for lobbying against cuts in school nurse coverage and time.</li> </ul>
<ul style="list-style-type: none"> <li>• New food allergy policies may be unpopular among staff, parents, and students</li> </ul>	<ul style="list-style-type: none"> <li>• Old habits die hard, especially in schools that only recently implemented policies; this is apparent when it comes to bake sales, food for celebrations, cultural events, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider meeting with administration to coordinate rollout of new policies.</li> <li>• Attempt to have a clear and unified message. Encourage staff to respond to questions and concerns from parents in a positive way.</li> <li>• Remind all parties of the fact that certain prevention and preparedness strategies and issues are necessary. These policies are not arbitrary or personal preference.</li> <li>• Consider having an allergist, physician, or educator meet/speak to school community and/or serve on a wellness council.</li> <li>• Remind your community, “Don’t kill the messenger.”</li> </ul>
<ul style="list-style-type: none"> <li>• Multiple chains of command governing the staff may exist within a school (i.e., not all staff answer to the same administrative body)</li> </ul>	<ul style="list-style-type: none"> <li>• In some schools, various staff members such as bus drivers and maintenance or food service staff may not fall under the same administrative body as do the rest of the staff.</li> <li>• Some staff may not attend the same staff development sessions and have different amounts of time to be allocated to their specific training.</li> <li>• Also some unions have regulations that need to be considered when requesting training time.</li> </ul>	<ul style="list-style-type: none"> <li>• Meet with each group. See if all can coordinate for a single meeting.</li> <li>• Following initial training by the school nurse, consider use of training tools that can be used “on own time” or individual sessions for reinforcement of material. See if training tools can be reviewed during staff development.</li> <li>• Have a close working relationship with administration and the staff.</li> <li>• When possible, consider having the school nurse make “morning rounds” to classrooms of students with allergies to answer questions and reinforce classroom food allergy management strategies.</li> </ul>
<ul style="list-style-type: none"> <li>• Individuals who ignore policies</li> </ul>	<ul style="list-style-type: none"> <li>• Sometimes, despite excellent and organized attempts to educate and communicate, some individuals do not comply with school policies.</li> </ul>	<ul style="list-style-type: none"> <li>• Be consistent with your expectations. Do not let certain things slide.</li> <li>• Use federal, state, and local guidelines as a beginning rationale and remind parents that it is not your call; it is safe practice.</li> <li>• Enlist the assistance of administration and nursing leadership.</li> <li>• Remind the community, “Don’t kill the messenger.”</li> </ul>

(continued)

**Table 2.** (continued)

Challenges	Specifics	Potential Solutions
<ul style="list-style-type: none"> <li>Parents or students who don't agree with content of food allergy education</li> </ul>	<ul style="list-style-type: none"> <li>At times there will be families that don't believe the current education or implemented policies are stringent enough.</li> <li>Alternatively, some may make recommendations that are overly restrictive and difficult to implement.</li> </ul>	<ul style="list-style-type: none"> <li>It is helpful to base all education content on state and federal guidance documentation, including explaining to parents the broadened definition for Section 504 eligibility.</li> <li>It is also helpful to use evidence-based food allergy educational resources.</li> <li>Enlist the assistance of school nurse leadership and/or the child's healthcare provider.</li> </ul>
<ul style="list-style-type: none"> <li>Fear of singling out or embarrassing the student</li> <li>Fear of releasing confidential health information</li> </ul>	<ul style="list-style-type: none"> <li>Issues may arise when a student does not want to be singled out, and similarly confidential health information should be protected.</li> <li>While having a classroom lesson centered to the individual child with allergies may work well, in some cases it may make the child uncomfortable.</li> </ul>	<ul style="list-style-type: none"> <li>Implement universal teaching to all students based on the present needs of children in general in the school, not the needs of individuals.</li> <li>Be aware of confidentiality policies and laws—always be careful to respect a student and parent's right to confidentiality.</li> </ul>

students with food allergies outside the school setting, such as at play dates, parties, and other social gatherings.

- Students** can pick up on the messages of their teachers, parents, and others in the school community. In addition to potential negative messages in the community, their own perception of an unexplained difference in their peer with food allergies can foster bullying and isolation. A recent study demonstrated that over one third of those over age 5 have been bullied, teased, or harassed because of their food allergies (Lieberman, Weiss, Furlong, Sicherer, & Sicherer, 2010). Replacing misperception and negative attitudes with education can create an environment of support and understanding. Much of the child's perceptions of food allergies can come from picking up on the attitudes of parents and teachers, but direct education can be very effective. Children also are instrumental in teaching each other and their parents, and they play a critical role in establishing a community

of support. Food allergy awareness can be taught using multiple means including curriculum, class discussions, assemblies, special guests, and so forth (see Table 1; NSBA, 2012).

### Challenges and Solutions to Community-Wide Education

Inevitably, challenges will arise. No two schools are the same and the social dynamics between you and your staff, your families, and your students are constantly evolving. In some cases there is one school nurse covering more than one school. In some schools there is a close working relationship between nursing and administration while in others this is not so. Despite these circumstances, food allergy education is necessary. Although there are many challenges, most can be overcome through the use of guidelines; guidance documents; training materials; and support from food allergy organizations, each other, school physicians, students' physicians, local speakers, advocates and experts, and your school community (see Table 2). Efforts to create a food allergy

aware school community may ultimately save time, decrease divisiveness, and even save a life. ■

For free, online school community training modules created by the authors, please see <http://Schools.Allergyhome.org>.

### Acknowledgments

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## Anaphylaxis Action – Clinical Conversation Topic

### Creating a New Community of Support for Students with Food Allergies



#### Content Considerations

1. Do first time allergic reactions occur at school? What percentage of students that received epinephrine in the Massachusetts study did not have a known allergy at the time they experienced a severe allergic reaction?
2. Name some of the resources available to guide the school in food allergy management.
3. What are some of the issues that can divide a school community when considering food allergy management?
4. What are legislative initiatives attempting to establish in schools?
5. What is a major component of food allergy management?
6. Who must understand and act on food allergy management in the school setting?

## Anaphylaxis Action – Clinical Conversation Topic

### Creating a New Community of Support for Students with Food Allergies



#### Idea Implementation

Each member of the school community has a role in food allergy management. What are some of the important issues and concerns that the school nurse should approach with each of the following school community members?

7. All school staff
8. Parents of students with food allergies
9. Parents of non-food allergic children
10. Students



#### Practice Point

How can the information in this article shape and change your practice of school nursing?

## Anaphylaxis Action – Clinical Conversation Topic



### Discussion Article

Article: **Implementation of a Stock Epinephrine Protocol**

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Vokits, K., Pumphrey, I., Baker, D. & Krametbauer, K. (2014)

Implementation of a stock epinephrine protocol. *NASN School Nurse*, 22. doi: 10.1177/1942602X14546642

**Abstract:** The Nevada State Legislature recently mandated that all schools in Nevada have stock epinephrine available. Clark County School District is the fifth largest school district in the nation. The article describes the process utilized by a school nurse task force to implement a mandated stock epinephrine program in the Clark County School District during the 2013 – 2014 school year.

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## Implementation of a Stock Epinephrine Protocol

Kathleen Vokits, Irma Pumphrey, DeAnn Baker and Karen Krametbauer  
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# Implementation of a Stock Epinephrine Protocol

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*The Nevada State Legislature recently mandated that all schools in Nevada have stock epinephrine available. Clark County School District is the fifth largest school district in the nation. This article describes the process utilized by a school nurse task force to implement a mandated stock epinephrine program in the Clark County School District during the 2013-2014 school year.*

**Keywords:** anaphylaxis; epinephrine; auto-injector epinephrine; school nurse; stock medication

**A**naphylaxis is a severe allergic reaction that has a rapid onset and may be fatal. It may be caused by certain foods, synthetic materials, or insect bites. These foods may include, but are not limited to, peanuts, tree nuts, milk, shellfish, fish, eggs, wheat, and soy (NASN 2012). Strict avoidance is the only way to prevent life-threatening allergic reactions. Epinephrine must be administered immediately if anaphylaxis occurs. Studies indicate that 16% to 18% of school-age children who have food allergies have had a reaction in school (Young, Munoz-Furlong, & Sicherer, 2009). In addition, in approximately 25% of the reactions that occur at school, the student had not yet been diagnosed with

food allergy (Massachusetts Department of Public Health, 2010).

In 2013, the Nevada State Legislature passed a bill (S. 453, 2013) that directed all public schools in the state to maintain stock epinephrine. The legislation specifically assigns roles in this implementation of stock epinephrine to the school nurse:

The school nurse coordinates with the principal of the school to designate employees of the school who are authorized to administer auto-injectable epinephrine. The school nurse provides the employees so designated with training in the proper storage and administration of the auto-injector.

... A school nurse or other designated employee of a public school may administer auto-injectable epinephrine maintained at the school to any pupil on the premises of the public school during the regular school hours whom the school nurse or other designated employee reasonably believes is experiencing anaphylaxis. ("Maintenance and Administration," 2013)

Prior to this legislation, the Clark County School District (CCSD), the fifth

largest district in the nation, had developed a system for training teachers and staff the symptoms of anaphylaxis and epinephrine administration for students with individually prescribed epinephrine. This training utilized three tiers:

**Tier 1:** Annual online video viewing required of ALL district employees that discusses anaphylaxis and prevention of exposure. The video is approximately 15 minutes in length.

**Tier 2:** School nurse presentation at each school at a beginning of the year meeting utilizing a PowerPoint presentation developed by the CCSD Anaphylaxis Committee. The overview addresses the symptoms of anaphylaxis and prevention of exposure as well as discusses bullying. The length of this training depends on the amount of time allotted to the school nurse, lasting up to 45 minutes.

**Tier 3:** School nurses training of individual teachers who have direct contact with students with known allergies with prescribed medications. Emergency Care Plans are reviewed and the teacher receives hands-on training in the use of the specific auto-injector that his or her student is



prescribed. Field trips and care of the auto-injector are reviewed. The length of training depends on the teacher and his or her comfort level with the auto-injector. The goal of the training is for the teacher to be able to identify the symptoms of anaphylaxis and to successfully demonstrate how to use the auto-injector. District policy requires that verification of training must be completed monthly through teacher demonstration on how to use the auto-injector.

As stated earlier, the CCSD is the fifth largest school district in the nation with 314,946 students attending 364 separate schools. It encompasses 8,091 square miles and consists of urban, suburban, and rural school settings. There are 185 school nurses for the district working under the Health Services Department, and as such, school nurses may be assigned to multiple sites in the district. All of the above factors were taken into consideration in developing a program for stock epinephrine.

## Implementation

Although the CCSD had established plans for the care of students with known allergic responses, the new regulation required the recognition of anaphylaxis versus allergic response, obtaining and storing stock epinephrine, appropriate dosing for a student whose weight is not known, and the development of a new protocol for medication not prescribed to a specific student. A school nurse task force was assembled. The CCSD called upon the expertise of a local epinephrine resource school nurse (ERSN). “ERSNs provide professional development and technical assistance to school nurses and the school community related to epinephrine administration” (NASN, 2014). In addition to the ERSN, the task force consisted of a health services nurse coordinator (supervisor), a school nurse with pediatric intensive care unit/emergency background, and a school nurse with many years of experience. The task force met for 8 hours a day for 3 days over a 2-week period.

The task force began by identifying states with stock epinephrine legislation in place. Illinois was one such state, and due to the size of CCSD, a review of Chicago School District Policy was deemed appropriate. Comparing similar processes that had been developed in the Chicago School District, the task force addressed the following issues.

### 1. Obtaining prescription and medication.

The law was signed May 29, 2013, and became effective July 1, 2013. There was no precedent for stock medication in schools in the state of Nevada. The medical consultant for CCSD Health Services reviewed the policy and then issued the prescription. Both the medical consultant and the pediatric allergist agreed that the CCSD would use the recommended dosage from the manufacturers. After this was completed, the order for 730 auto-injector epinephrine pens was placed (enough epinephrine for every school to receive two doses of 0.3 mg and two doses of 0.15 mg). Also included was the “measuring device” (see step 2), a pair of gloves, and the protocol for anaphylaxis (see Figure 1). The CCSD obtained the initial 730 auto-injectors free of charge through the *EpiPen4Schools* program offered by Mylan Specialty (<http://www.bioridgepharma.com/programs.html>).

**2. Protocol.** A protocol was needed in order to train staff (registered nurses and unlicensed assistive personnel [UAP]) in the implementation of stock epinephrine use. The task force decided that the school nurse, along with the principal, would decide how many trained personnel would be required at each school site, and they agreed upon a minimum of two UAPs. Utilizing information from our ERSN and NASN’s *Get Trained* program, the task force implemented a training protocol that included a PowerPoint presentation of an overview of anaphylaxis including examples of symptoms, when to give the auto-injector, and how to complete the documentation of use.

The protocol was placed in a short one-page written format for reference (see Figure 1). The School Nurse Special Procedures Manual was updated to include the protocol.

**3. 0.3 mg versus 0.15 mg dose.** How would UAPs be trained to determine the appropriate dose to administer? Consultation with emergency care providers indicated that measuring devices, such as the Broselow Tape, have been used for many years in the emergency setting (North Carolina Department of Health and Human Services, n.d.). A measuring device with a length of 135 cm would approximate the weight of a 30 kg (approximately 66 pounds) child. Plastic measuring tapes cut to the specific length of 135 cm were prepared for every health room and referred to as the measuring device. UAPs were trained that if a student is shorter than the measuring device, the 0.15 mg dose should be used. If the student is taller than the device, the 0.3 mg dose should be used. Training also emphasizes that if in doubt as to size/weight of the student, use the higher dose.

**4. Storage of epinephrine.** Clark County, Nevada, is located in the Mojave Desert, and summer temperatures can be above 115°F. Most schools are closed during the month of July, and energy saving policies permit air conditioning only when the building is occupied. According to the manufacturer, epinephrine auto-injectors should be stored in the carrier tube provided at a temperature of 25°C (77°F); however, temperature excursions between 15°C and 30°C (59°F and 86°F, respectively) are permitted. In addition, the manufacturer advises against storing the auto-injectors in refrigerators or in a vehicle’s glove box, and against exposure to extreme heat or cold (EpiPen, 2014). Auvi-Q has similar temperature restrictions: “Store at 20°-25°C (68°-77°F); excursions permitted to 15°-30°C (59°-86°F)” (Auvi-Q, 2014). The temperature in CCSD unoccupied

**Figure 1.** Protocol for Anaphylaxis

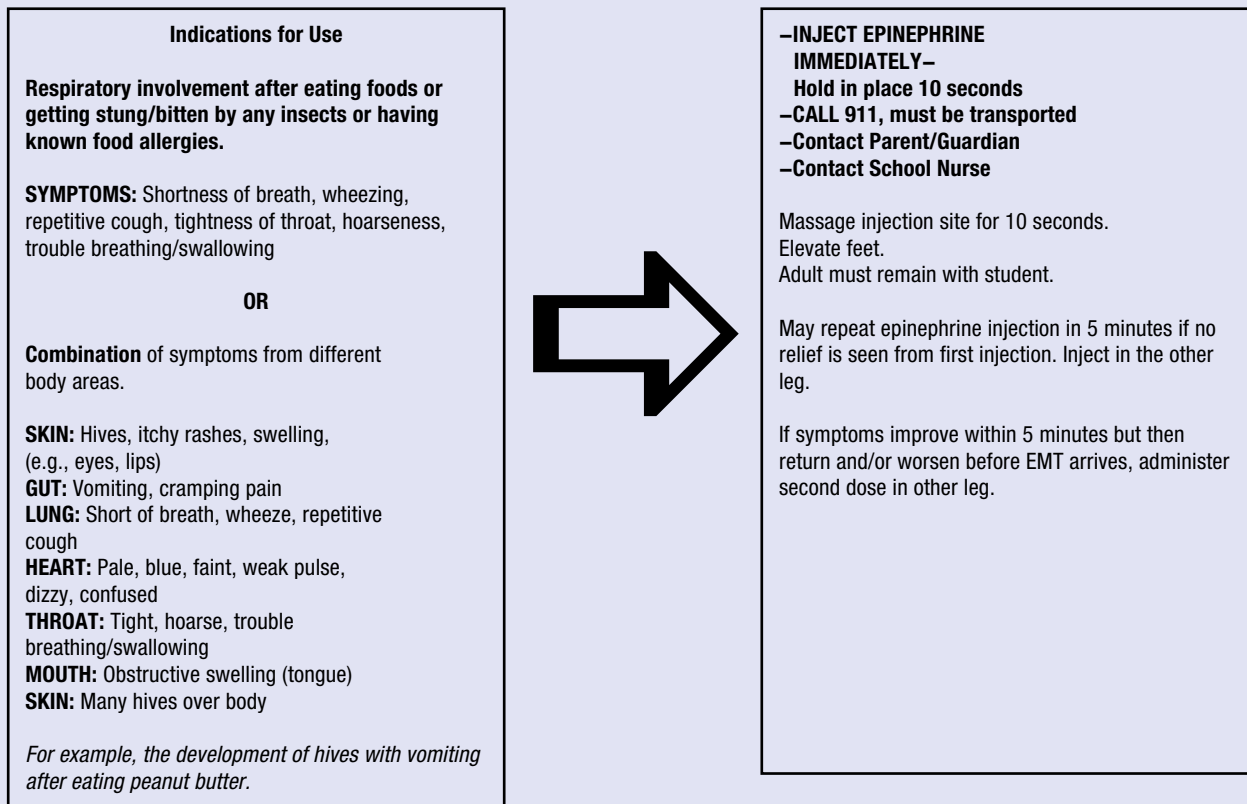
CLARK COUNTY SCHOOL DISTRICT  
Health Services Department

**EPI-PEN STANDING ORDER (STOCK MEDICATION) PROTOCOL  
FOR ANAPHYLAXIS (SEVERE ALLERGIC REACTION)**

Epinephrine auto injector dose:

0.15 mg IM (if less than 66\* pounds) *\*Note: New recommendations advise 55 pounds.*

0.3 mg IM (if 66 pounds or greater)



**May only be administered by appropriately trained and qualified school personnel.**

buildings may climb above the recommended temperatures listed by the manufacturer for epinephrine. In order to safely store the epinephrine, the auto-injectors were moved to the computer server room, which has a maintained temperature at the end of each day. This policy was in place until October 2013, when the temperatures are more moderate.

**5. Packaging and delivery.** Every school received a two-injector box of 0.3 mg auto-injector epinephrine and a two-injector box of 0.15 mg of

auto-injector epinephrine. Also included was the “measuring device” (see step 2), a pair of gloves, and the protocol for anaphylaxis (see Figure 1). The two boxes were distinguished by placing yellow tape around the 0.15 mg dose and writing JR (junior) on the tape. The entire “kit” was placed in a plastic baggie and secured with red tape to differentiate it from student-prescribed auto-injectors. When a dose is used, the entire kit is removed and replaced with a new kit. The school nurse along with Health

Services and the school’s administration decide how many kits are needed, depending on the school’s location and size of the campus. Packaging and delivery are maintained at the Health Services main office.

**6. Initial training.** The task force determined that Tier 4 training was needed. The first groups of employees trained were from schools hosting summer programs with students on or after July 1, 2013. All 185 school nurses were trained in

**Figure 2.** Temperature Controlled Unit with Identifying Signage



how to present the protocol to UAPs utilizing the original Tier 2 training and a newly developed Tier 4 training that discussed the protocol changes and required documentation after administration of stock epinephrine. School nurses work a 9-month contract. Thus, arrangements were made to allow school nurses to work extra duty days to provide the needed training sessions. At least two employees from each summer site were required to attend the trainings before the site opened. Fifteen trainings were required in order to facilitate the number of trainees. The size of each 2-hour training session was limited to 50, allowing for the hands-on training required for administration of an auto-injector pen. A ratio of 10:1 was maintained for this training. UAPs who had previously received training in Tier 2 received a shorter training (1 hour in length) in the recognition of anaphylaxis in unknown individuals, appropriate response, and required documentation after administration of epinephrine. In all, approximately 600 personnel were trained in the new protocol before the start of the 2013-2014 school year.

**7. Documentation.** The CCSD utilizes an electronic health record system. The program allows for stock medication documentation. Since the CCSD had not previously utilized this portion of the program, another area of training was required for system

users (approximately 460 users). In addition, other new forms were required to meet the documentation requirement. An “Evidence of Delivery” form was implemented to monitor stock levels. The form is completed whenever a new kit is received by a school and includes the recording of the medication stock number in the event of a recall. A database of all stock epinephrine is maintained at Health Services. Lastly, a “Report of District-Issued Auto-Injector Epinephrine Administration” was developed to be completed as soon as possible after use of the stock epinephrine and sent to Health Services. The report assists the director of health services with demographic and event information for the student who received the stock epinephrine. Per Senate Bill 453, the director must report district-issued epinephrine usage yearly to the Health Division of the Department of Health and Human Services.

### Epinephrine Usage

As of April 30, 2014, there have been 24 doses of stock epinephrine administered in the CCSD for the 2013-2014 school year. Sixteen of those doses were given by registered nurses. Eight doses were given by UAPs. Of the 24 doses given, 14 students had a known allergy and received stock epinephrine for their symptoms. Eight students had an unknown allergy with 5 specifically noted as “new allergies.” The other 2 doses were administered by a registered nurse to adults with anaphylaxis symptoms. There are currently 1,652 epinephrine prescriptions written for specific students. Ten students have received their own epinephrine in addition to those given out of the stock medication. To compare that to the 2012-2013 school year, there were 1,337 orders for epinephrine prescribed to specific students with 4 doses administered to students per individualized prescriptions. Thus, we saw not only an increase in administration of individually prescribed

epinephrine but the addition of 24 stock epinephrine administrations.

### Lessons Learned

During the course of the year, adjustments were needed in various aspects of our implementation. Placement and storage of the auto-injector kits over the summer months were discussed throughout the year. Placement in the computer server rooms was not convenient. There was no guarantee that these rooms were temperature specific to epinephrine. The security and cleanliness was also a concern. The district reviewed the issues and determined that a wine storage unit would maintain the needed temperature ranges combine sentence below by doing the following: A small unit was ordered for every school in the district (referred to as a temperature controlled unit [TCU] rather than a wine storage unit). The universal poster signifying location of the auto-injectors was placed on the front of the unit along with a no food/drinks sign since the device does not maintain a safe temperature for food. The auto-injectors remain in the health office throughout the year in the TCU (see Figure 2).

Next, small changes have been made to the protocol. The wording on some forms was changed to clarify the actions of the UAP. The phrase, “Hold in place for 10 seconds,” was added to the one-page summary form as a reminder for the UAP. The demographic information on the “Report of District-Issued Auto-Injector Epinephrine Administration” was rearranged to make it more user friendly and to help compile the needed information.

A continual area to address is training, especially when changes are made to the protocol. The current protocol uses the drug manufacturer’s advised dosing of 0.3 mg at approximately 66 pounds. The American Academy of Pediatrics has recommended that consideration should be given to prescribing the 0.3 mg dose at approximately 55 pounds (Sicherer & Mahr, 2010). If and when this criterion is adopted, a plan must be in place to retrain all involved individuals and to

update the protocol. Additionally, district policy requires ongoing training throughout the school year. Monthly, trained UAPs are provided a scenario that requires recognition of anaphylaxis and demonstration of auto-injector use. The length of time required for the monthly trainings varies from a few minutes to 1 hour. If a staff member requires frequent retraining, the school nurse in consultation with the principal may remove that person from the team. The amount of time necessitated for the monthly training has been a challenge. The level of commitment to training naturally varies between UAPs due to the multitude of various demands on staff time. Some principals participated in the decision-making portion of the training and attended the training session, so they knew what was expected of their staff. Other principals left it up to the school nurse to decide how many personnel to train.

In conclusion, school nurses must prepare to respond to legislation that impacts their scope of practice. Nevada nurses received a mandate to implement stock epinephrine on school campuses. School nurses find themselves in the role of lead educator in the recognition of anaphylaxis and its treatment. Additionally, school nurses develop protocols in collaboration with medical advisors, secure supplies, design training programs, and ensure that adequate documentation and reporting systems are in place. Lastly, school nurses continually evaluate programs and determine areas for program improvement. ■

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# Anaphylaxis Action – Clinical Conversation Topic

## Implementation of a Stock Epinephrine Protocol



### Content Considerations

1. Epinephrine legislation differs from state to state. In the law passed in Nevada in 2013, roles were assigned for management of stock epinephrine. In this law, who is authorized to administer stock epinephrine? Who is responsible for training school employees?
2. What teaching and learning was incorporated into the three tiers of learning utilized in the Clark County approach?
3. What are the seven major issues identified in implementing a stock epinephrine program in this article?
4. How many doses of stock epinephrine were administered in Clark County in the 2013 – 2014 school year? How many were administered to students without a known allergy?
5. How did the school district manage the storage issues related to stock epinephrine?
6. What lessons did the Clark County school nurses learn following the implementation of their stock epinephrine program?

## Anaphylaxis Action – Clinical Conversation Topic

### Implementation of a Stock Epinephrine Protocol



#### Idea Implementation

7. In the 2013 Nevada law, it was clearly defined who could administer epinephrine and who could train school employees in epinephrine administration. Does your state have a law that addresses stock epinephrine? Who can administer your stock epinephrine? Who is responsible to train any school employees that may be allowed to administer stock epinephrine?
8. What are your school district's success and challenges related to the following implementation issues related to stock epinephrine? If you don't have stock epinephrine, how would you guide your school district on the questions below if stock epinephrine was implemented in your school?
  - How do you obtain a prescription and the medication?
  - Do you have a protocol in place? How is that communicated?
  - What dosage parameters are you using to determine if a student should receive an adult or pediatric dose?
  - How are you storing stock epinephrine?
  - Who trains your school staff? How often?
  - What should be documented following epinephrine administration?
9. What should be included in an annual evaluation of a stock epinephrine program?



#### Practice Point

How can the information in this article shape and change your practice of school nursing?

# Anaphylaxis Action – Clinical Conversation Topic



## Discussion Article

Article: **Recognition and Treatment of Anaphylaxis in the School Setting: The Essential Role of the School Nurse**

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Schoessler, S. & White, M. (2013) Recognition and treatment of anaphylaxis in the school setting: The essential role of the school nurse. *NASN School Nurse*, 29: 407-415. doi: 10.1177/1059840513506014

**Abstract:** Since anaphylaxis is unpredictable, rapid in onset, and potentially life threatening, it is critical for school staff to recognize and respond to its symptoms quickly. The symptoms of anaphylaxis can be challenging to differentiate, particularly in school-age children who may have trouble explaining what they are experiencing. School staff must understand the distinctive ways in which children describe and manifest anaphylactic symptoms, and the school nurse has a key leadership role in providing this training. The school nurse should create and coordinate individualized emergency care/action plans for students with known allergies, as well as a comprehensive care plan for all students, to ensure a safe environment and a rapid response to any life-threatening allergic reaction. This should include having epinephrine stocked and readily accessible so that it can be given promptly in the case of an anaphylactic emergency.

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## Recognition and Treatment of Anaphylaxis in the School Setting: The Essential Role of the School Nurse

Sally Schoessler and Martha V. White

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# Recognition and Treatment of Anaphylaxis in the School Setting: The Essential Role of the School Nurse

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## Abstract

Since anaphylaxis is unpredictable, rapid in onset, and potentially life threatening, it is critical for school staff to recognize and respond to its symptoms quickly. The symptoms of anaphylaxis can be challenging to differentiate, particularly in school-age children who may have trouble explaining what they are experiencing. School staff must understand the distinctive ways in which children describe and manifest anaphylactic symptoms, and the school nurse has a key leadership role in providing this training. The school nurse should create and coordinate individualized emergency care/action plans for students with known allergies, as well as a comprehensive care plan for all students, to ensure a safe environment and a rapid response to any life-threatening allergic reaction. This should include having epinephrine stocked and readily accessible so that it can be given promptly in the case of an anaphylactic emergency.

## Keywords

anaphylaxis, allergy, asthma, school, nurse, training, epinephrine, emergency action plan

School nurses have a crucial role in identifying and managing anaphylaxis in children in the school setting. However, prevention and management of these reactions must be a shared responsibility among all personnel with child care responsibilities, from teachers to cafeteria workers, coaches, bus drivers, playground monitors, and others. The school nurse is best equipped to effectively educate and train school staff regarding anaphylaxis.

## Defining Anaphylaxis

Anaphylaxis has many possible symptoms, which can vary across patients as well as within the same patient. Anaphylaxis symptoms can also be nonspecific and thus may overlap or mimic symptoms of more common conditions (Dinakar, 2012). For many years, anaphylaxis did not have a clear, consistent definition, and symptoms were sometimes misinterpreted as panic attacks, hyperventilation, vasovagal syncope, or another type of allergic reaction (Dinakar, 2012). Attempts have been made to define the number and type of symptoms that must be present in order to clearly identify anaphylaxis, or the time between allergen exposure and symptom onset, but the specific elements of these definitions still vary (Bohlke et al., 2004). The resulting misdiagnosis and underreporting has complicated the epidemiology of anaphylaxis. To address this issue, a Joint Task Force on Practice Parameters from the American Academy of Allergy, Asthma and Immunology (AAAAI)

and the American College of Allergy, Asthma and Immunology (ACAAI) gathered in 2005 and standardized the definition of anaphylaxis as “a condition caused by an IgE-mediated reaction that is often life-threatening and almost always unanticipated” (Dinakar, 2012; Joint Task Force on Practice Parameters, American Academy of Allergy Asthma and Immunology, American College of Allergy Asthma and Immunology, & Joint Council of Allergy Asthma and Immunology, 2005). The Practice Parameters were updated in 2010, with no change to the original criteria for diagnosis (Lieberman et al., 2010). Only minor revisions were made to management algorithms, with new sections on insect sting reactions and anaphylaxis to omalizumab and other biologic medications (Lieberman et al., 2010).

## Symptoms of Anaphylaxis

The immunoglobulin E (IgE)-mediated reaction in anaphylaxis is systemic (i.e., affecting two or more organs or systems) and is due to the release of active mediators from mast cells and basophils in both adults and children (Boyce

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et al., 2010; Moneret-Vautrin, Morisset, Flabbee, Beau-douin, & Kanny, 2005). The release of histamines from mast cells leads to cardiovascular symptoms such as flushing and hypotension due to vasodilation (Moneret-Vautrin et al., 2005). Elsewhere in the body, increased vascular permeability results in urticaria, abdominal cramping, bronchorrhea, and laryngeal and/or cutaneous angioedema. Additionally, the release of leukotrienes and prostaglandin D<sub>2</sub> leads to bronchoconstriction. Other cardiovascular symptoms, such as tachycardia, arrhythmia, syncope, and chest pain, may also be present. If there is hemodynamic collapse, it can lead to hypotension and shock in as little as 10 min (Joint Task Force on Practice Parameters et al., 2005; Lieberman et al., 2010; Robinson & Ficca, 2012).

About 80% of those affected present with both skin symptoms (e.g., urticaria, facial angioedema, pruritus, flushing) and respiratory symptoms (e.g., coughing, wheezing, difficulty breathing, stridor; Boyce et al., 2010; Moneret-Vautrin et al., 2005; Robinson & Ficca, 2012). Anaphylaxis may also manifest with gastrointestinal symptoms (e.g., nausea, vomiting, abdominal cramps, diarrhea) and/or neurological symptoms (e.g., anxiety, headache, seizure, altered consciousness). Other possible symptoms include urinary or fecal incontinence, diaphoresis, metallic taste, and a feeling of impending doom (Boyce et al., 2010; Robinson & Ficca, 2012).

Symptoms and their severity can vary depending on the individual and the type and extent of allergen exposure (Robinson & Ficca, 2012). Cutaneous and cardiovascular symptoms are more common in adults with anaphylaxis, but children more commonly exhibit respiratory symptoms. These differences could be due to the types of triggers; for example, food triggers that tend to cause respiratory symptoms are more common in children, whereas insect bites and medication allergies that tend to lead to cardiovascular symptoms are more common in adults (Braganza, Acworth, Mckinnon, Peake, & Brown, 2006; de Silva, Mehr, Tey, & Tang, 2008; Dinakar, 2012).

It is important for school staff to be aware that young children will describe symptoms differently than an older child, adolescent, or adult would (Robinson & Ficca, 2012). For example, children may complain that “my mouth burns,” “my tongue itches,” “there’s something stuck in my throat,” or “it feels like there are bugs in my ears” (Robinson & Ficca, 2012). When a child in a school lunchroom says “this food is too spicy,” anaphylaxis may not be the teacher’s first thought, and precious time may be lost while the teacher tries to deduce what is happening (Food Allergy and Anaphylaxis Network, 2008). Some symptoms may be difficult to recognize as anaphylactic, such as a squeaky/hoarse vocal change (indicating laryngeal edema) or slurred speech (due to tongue swelling; Robinson & Ficca, 2012). In contrast, a child simply may appear “fidgety.”

The symptoms of anaphylaxis may begin anywhere from a few minutes to several hours after exposure to the allergen.

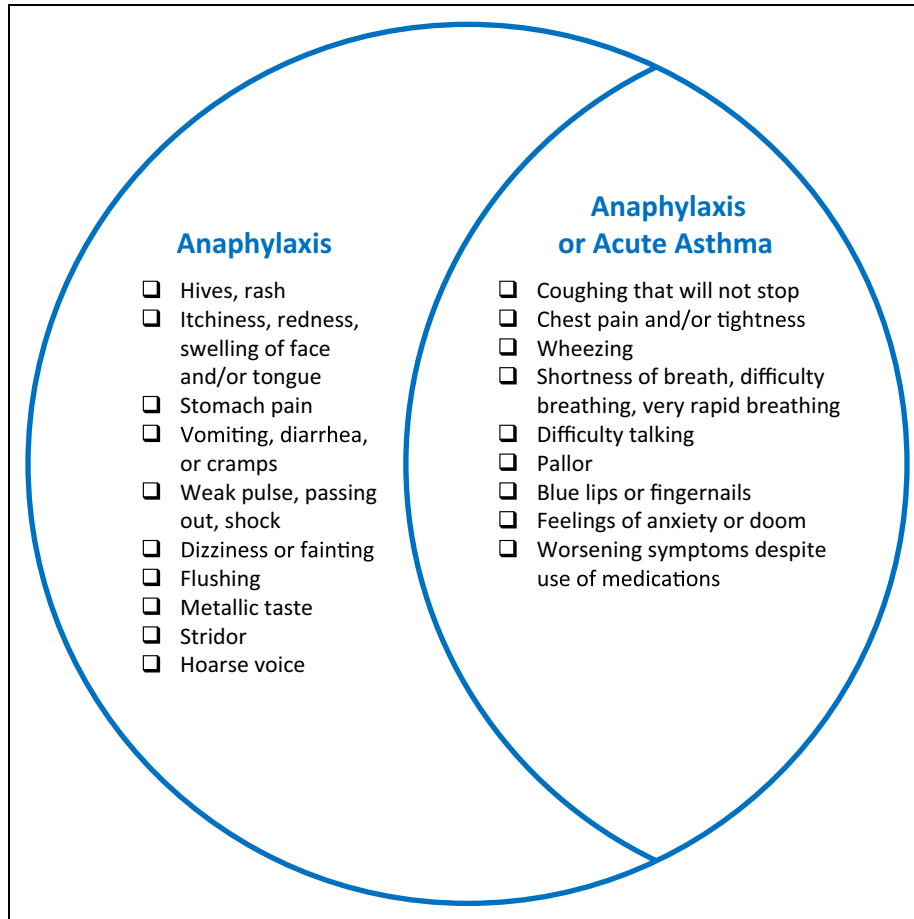
Although most reactions occur within the first hour, some have been known to occur up to 72 hours after initial exposure, making it more difficult to identify the allergen involved (Robinson & Ficca, 2012). It is important to be aware that not all anaphylactic reactions have the same time course. Although some reactions may be uniphasic (i.e., occurring immediately after exposure and resolving, with or without treatment, in minutes to hours), about 20% of the reactions are biphasic (i.e., recurring after the apparent resolution of initial symptoms, usually about 8 hr after the first reaction) and a small number are protracted (i.e., persisting for hours or days after the initial reaction; Dinakar, 2012; National Association of School Nurses, 2012a). Treatment of an acute event does not differ regardless of the time course, and since the child is likely to be sent home or to the emergency room after an acute event, he or she is unlikely to be at the school when the second phase of a biphasic event starts (as discussed later).

### *Differentiating Anaphylaxis From Asthma*

Asthma is a chronic inflammatory disease of the airways. In the presence of triggers, such as inhaled allergens, cold air, respiratory infections, exercise, or irritants such as cigarette smoke, the airways become inflamed, leading to narrowing or obstruction, and, thus, difficulty breathing. If not treated, an acute asthma attack can lead to death (Ontario Public Health School Asthma Project, 2005). Allergic reactions, on the other hand, are hypersensitive overreactions of the immune system to otherwise harmless triggers (e.g., dust, pollen, foods). Anaphylaxis is a serious and systemic version of an allergic reaction, and it can be life threatening, especially if the patient already has asthma (Ontario Public Health School Asthma Project, 2005). Thus, an asthma attack caused by inhalation of cat dander is a classic example of an allergen-induced asthma attack, while peanut-induced anaphylaxis manifesting as hives and asthmatic symptoms is a classic example of an anaphylactic reaction to systemic (i.e., ingested) allergen exposure.

The triggers for asthma and those for anaphylaxis overlap to some degree (Table 1), but there are also some important differences. Asthma triggers include respiratory infections; inhaled allergens from furred or feathered pets, dust, pollen, or mold; irritants such as air pollution, smoke, chalk dust, strong smells (e.g., indelible markers, perfume), dusty gym mats, old books, cleaning products, and fumes; dry, cold air; or exercise (American Academy of Allergy Asthma and Immunology, 2012; Ontario Public Health School Asthma Project, 2005).

Across all age groups, the most common triggers for anaphylaxis are ingested foods (33%), insect stings (19%), and medications (14%). In about 25% of cases, the trigger is unknown. In children, food is the most common anaphylaxis trigger, accounting for 37% to 85% of cases (Dinakar, 2012). Common food triggers include peanuts, tree nuts, shellfish,



**Figure 1.** Comparison of anaphylaxis and acute asthma symptoms.

**Table 1.** Comparison of Anaphylaxis and Acute Asthma Triggers.

Anaphylaxis	Asthma
Ingested foods	Respiratory infections
Insect stings	Allergens <ul style="list-style-type: none"> <li>• Pet dander</li> <li>• Dust</li> <li>• Pollen</li> <li>• Mold</li> </ul>
Medications	Irritants <ul style="list-style-type: none"> <li>• Air pollution</li> <li>• Smoke</li> <li>• Chalk dust</li> <li>• Strong odors (eg, indelible markers, perfume)</li> </ul>
Latex	Environmental <ul style="list-style-type: none"> <li>• Dusty gym mats</li> <li>• Old books</li> <li>• Cleaning products</li> <li>• Fumes</li> </ul>
Cleaning agents	Dry, cold air
Exercise	Exercise

fish, milk, eggs, soy, sesame seeds, and wheat (Ontario Public Health School Asthma Project, 2005). Less common anaphylaxis triggers include cats, latex, cleaning agents, environmental allergens, and exercise; note that these triggers, with the exception of latex, are much less likely to cause anaphylaxis than they are to cause an asthma attack.

Similarly, the symptoms associated with asthma may also be present during anaphylaxis, but anaphylaxis has a broader clinical manifestation across multiple organ systems compared with asthma, which usually only affects the airways (Figure 1). Typical symptoms of asthma include wheezing, chest tightness, shortness of breath, coughing, and difficulty breathing (Ontario Public Health School Asthma Project, 2005). A person experiencing an anaphylactic response, however, may have any of the following symptoms, conveniently abbreviated with the acronym “FAST”: Face: itchiness, redness, and swelling of face and tongue; Airway: trouble breathing, swallowing, or speaking; Stomach: stomach pain, vomiting, and diarrhea; Total: hives, rash, itchiness, swelling, weakness, pallor (uncommon), sense of doom,

light-headedness, and loss of consciousness (Ontario Public Health School Asthma Project, 2005). When attempting to differentiate between the symptoms of asthma and anaphylaxis, the school nurse, who has nursing assessment skills, is the key school professional to lead the school staff in the awareness, prevention, and treatment of anaphylaxis (National Association of School Nurses, 2012a).

An important factor in the differential diagnosis of anaphylaxis is the emphasis on the sudden onset of multisystem symptoms (Simons et al., 2012). For example, the sudden onset of illness involving the skin and/or mucosal tissue, in combination with sudden respiratory symptoms or a sudden loss of blood pressure, is highly indicative of anaphylaxis (Simons et al., 2012). Conditions such as asthma and seasonal allergies would manifest with respiratory symptoms but would not be likely to include skin, cardiovascular, and gastrointestinal symptoms at the same time.

### *Prevalence and Mortality Rate of Asthma and Anaphylaxis*

The overall prevalence of asthma in the United States has been increasing over the past 2 decades, as has the severity of asthma, according to emergency department records from the 1990s (Iribarren, Tolstykh, Miller, & Eisner, 2010). Throughout the United States in 2009, there were 3,388 deaths due to asthma, of which 321 were in patients under the age of 25 (Kochanek, Xu, Murphy, Minino, & Kung, 2011). Asthma's mortality rate in patients under 25 years was 0.9 (0.0009%) per 100,000 individuals in the general population (Kochanek et al., 2011).

The prevalence of immediate allergic reactions, however, is poorly documented, and lethal anaphylaxis in particular may be underdiagnosed or misdiagnosed as asthma-related fatality (Moneret-Vautrin et al., 2005; Simon & Mulla, 2008). There are relatively few population-based studies of anaphylaxis in the United States, and the existing studies have conflicting results, partly due to inconsistent diagnoses and coding of anaphylaxis (Mulla, Lin, & Simon, 2011). For example, one study (Yocum et al., 1999) reported the average annual incidence of anaphylaxis as 21 per 100,000 between 1983 and 1987 in Minnesota, and another study reported the average annual incidence of anaphylaxis, based on emergency department visits in Florida, as up to 7.7 per 100,000 patients (Mulla et al., 2011). A follow-up to this Florida study looked specifically at anaphylaxis deaths and found the incidence of fatal anaphylaxis to be 5.02 (or 0.0502 per 100,000) per 10,000,000 individuals over a 10-year time period (Simon & Mulla, 2008).

The prevalence of anaphylaxis in the school setting is of particular concern. One study of a health maintenance organization population of nearly 230,000 children and adolescents in Washington state in the 1990s estimated that the incidence of anaphylaxis was about 10.5 per 100,000 individuals per year, with rates highest among adolescents aged

15 to 17 years and 40% higher among boys than girls (Bohlke et al., 2004). Food allergy prevalence has increased in recent years, with as many as 6 million (8%) children in the United States currently estimated to have food allergies. Moreover, nearly 40% of these U.S. children with food allergy have a history of severe reactions, including anaphylaxis (Gregory, 2012; Gupta et al., 2011).

Allergen exposure in the school setting is an issue that demands our attention. Stings from bees and other insects in the Hymenoptera order usually occur on the playground, although occasionally these insects gain access to the interior of the school. About 20% of food-related allergic reactions occur at school, including allergies that present for the first time in this setting (Cicutto et al., 2012; Muraro et al., 2010). Asthma and respiratory allergies are also exacerbated by poor ventilation and irritants common in school settings, such as indoor air pollution and chemicals. Exposure to allergens such as dust mites, mold, furry pets in the classroom, and cockroaches can trigger asthmatic or allergic reactions at school (Muraro et al., 2010). The National School Boards Association (NSBA) encourages schools to protect students by limiting the use of known allergens in classrooms and by providing areas that are allergen safe (National School Boards Association, 2011). Completely banning allergenic foods, however, is not recommended, since it is impossible to control what people bring onto the school grounds; it does not teach the affected children how to navigate in a world with allergens; and a ban of this sort also may give the parents, students, and staff a false sense of security (National Association of School Nurses, 2012a).

There is a commonly observed trend that those with asthma are at higher risk of severe food anaphylaxis, and vice versa (children with food allergies are 2 to 4 times more likely than children without these allergies to have asthma and other types of allergies), though the reasons for the association are not clearly understood (Iribarren et al., 2010; Robinson & Ficca, 2012; National Association of School Nurses, 2012a). One study in a large managed care population determined that patients with asthma had a 5.2-fold greater chance of having an anaphylactic reaction than those without asthma (Iribarren et al., 2010). In prospective studies of young patients, asthma (especially severe or uncontrolled asthma) was strongly associated with anaphylaxis, and a history of asthma was more likely to lead to dyspnea, wheezing, and respiratory arrest during a food-induced anaphylactic episode (Simons et al., 2012). Health professionals should be aware of this connection, keeping the risks of severe anaphylactic reactions in mind when they encounter patients with asthma, especially those who have respiratory, cutaneous, or cardiovascular complaints (Iribarren et al., 2010).

### *Treatment*

Allergy immunotherapy is effective in reducing the risk of anaphylaxis from bee and other Hymenoptera insect stings;

however, since there is no cure for food allergy, strict avoidance of known triggers is the first and best defense to prevent a reaction (National School Boards Association, 2011). Some triggers, however, may not have been previously identified, and avoidance is not always successful or even possible. Thus, with the increasing prevalence of food allergies in children, it is essential for schools to be prepared to respond appropriately to unexpected anaphylactic events (McIntyre, Sheetz, Carroll, & Young, 2005).

Evidence-based guidelines recommend the prompt administration of epinephrine as first-line treatment for an anaphylactic episode (Boyce et al., 2010; Dinakar, 2012; Lieberman et al., 2010; Simons et al., 2012). Use of first-line injectable epinephrine has been a consistent recommendation for many years. In an emergency situation, parents and school administrators should not be concerned about the adverse health effects of administering epinephrine, since adverse events such as anxiety and palpitations are not harmful for the average, healthy child (Gregory, 2012). Other treatments have also been attempted without using injectable epinephrine (e.g., antihistamines, sublingual isoproterenol, inhaled epinephrine, corticosteroids), but these have not prevented or relieved severe anaphylaxis and are therefore not recommended for first-line therapy (Boyce et al., 2010; Lieberman et al., 2010; Robinson & Ficca, 2012).

Within a school, an epinephrine autoinjector (EAI) may be used by the patient, school nurse, teacher, or other school personnel as permitted by state law and school policy. The school nurse plays the prominent role in the maintenance of EAIs and the education and training of other staff. Timely administration of epinephrine can be life saving. It can also slow the progression of the allergic reaction to allow time for further medical treatment (Dinakar, 2012; Sicherer & Mahr, 2010). Studies of fatal food-induced anaphylactic reactions showed that delay of appropriate treatment was a significant factor associated with death. If one is in doubt about whether to administer epinephrine or not, the safer option is to do so rather than take the risk of waiting too long (Gregory, 2012). Although the consequences of unnecessary administration of epinephrine include pain, inconvenience, and extra costs, the risks of not administering epinephrine when needed are clear.

As supported by professional and advocacy groups for allergy and asthma, school staff should be indemnified against prosecution for the consequences of administering emergency medication promptly (Asthma and Allergy Foundation of America, 2012; Muraro et al., 2010). Indeed, most of the stock epinephrine laws being considered by various states across the United States protect anyone who administers epinephrine in good faith from civil damages (Gregory, 2012).

Initial symptoms of anaphylaxis may be mild and difficult to interpret without training, and hesitation to use epinephrine sometimes can be attributed to the belief that a reaction is mild and there is no danger (Gregory, 2012).

Also, it is not possible to predict the severity of the final reaction from initial symptoms alone. Fatalities have been associated with delays in epinephrine delivery, so it should be administered promptly if there is any suspicion of anaphylaxis (Muraro et al., 2010).

Antihistamines,  $\beta$ -agonists (e.g., asthma medications), and glucocorticoids can be used as second-line treatments for anaphylaxis, but data on their effectiveness are limited and they should be used only as adjunctive therapy to epinephrine (Boyce et al., 2010; Choo, Simons, & Sheikh, 2010; Dinakar, 2012; Sheikh, ten Broek, Brown, & Simons, 2007). Antihistamines are sometimes given to alleviate skin symptoms, or to reduce the chance of a later-phase reaction, but research does not currently support this use (Boyce et al., 2010; Robinson & Ficca, 2012). Neither antihistamines nor asthma medications can reverse the symptoms of anaphylaxis (Boyce et al., 2010; Gregory, 2012).

In addition to medical treatment of an acute event, subsequent care must include emotional support for a child suffering an anaphylactic reaction. Support also should be provided to other children who witness the event and any involved school staff, as needed.

### Dosing

In children, the recommended epinephrine dose is 0.01 mg/kg of a 1 mg/mL solution (i.e., 1:1000 dilution) via intramuscular (IM) injection into the midanterolateral thigh (Boyce et al., 2010; Dinakar, 2012; Lieberman et al., 2010). Repeated dosing of epinephrine is recommended (after 5 to 10 min) if response is suboptimal or symptoms are progressing (Dinakar, 2012; Lieberman et al., 2010). Although individual prescribing habits may vary among physicians, a recent publication suggested prescribing 0.15 mg epinephrine for children who weigh between 22 and 55 pounds and 0.30 mg for those above 55 pounds. However, this dosing is not indicated within the package inserts for the three branded EAIs and one generic equivalent for one (only) of these branded products currently available in the United States. The dosing approved by the Food and Drug Administration for these devices is the 0.15-mg autoinjector, indicated for patients weighing 15–30 kg (33–66 pounds), and the 0.3-mg autoinjector, intended for patients weighing 30 kg (66 pounds) or more (Amedra Pharmaceuticals LLC, 2013; Lineage Therapeutics, 2013; Mylan Specialty L.P., 2012; sanofi-aventis U.S. LLC, 2012). The recommended dose of epinephrine drawn from a stock bottle for IM injection is 0.01 mg/kg, up to a maximum dose of 0.3 mg for children or 0.5 mg for adults (Dinakar, 2012; Lieberman et al., 2010).

### Importance of Stock Epinephrine

A study evaluating the incidence of anaphylaxis in Massachusetts schools found that 19% of the cases occurred outside the school building (e.g., on the playground or traveling to/from school or a field trip); and in 24% of the cases, the school

staff was unaware that the student had a life-threatening allergy (Gregory, 2012). School staff such as bus drivers, food service employees, and teachers should be made aware of students with known allergies and should be informed about and trained to deal with emergency situations.

Attention to this issue was heightened after two recent child fatalities due to anaphylaxis that occurred at schools where epinephrine was not available (Gregory, 2012). To protect students at risk of anaphylaxis, as well as students whose allergies may still be undiagnosed, there is a nationwide effort to equip schools with EAI that are not student specific (i.e., "stock" epinephrine) in case of emergencies (Gregory, 2012). Since nearly 25% of children have their first food allergy reaction on school grounds, and food allergens may be present in multiple school settings (e.g., classrooms, hallways, lunchrooms, playgrounds), all schools should have training programs and clear emergency protocols authorizing staff to administer stock epinephrine when needed, regardless of whether the school has students with allergies already identified (McIntyre et al., 2005; Muraro et al., 2010).

Protocols for stock epinephrine enable schools to administer this lifesaving medicine promptly in the case of an emergency. It can be used for students who do not have an EAI with them at school, as well as in cases where a student-prescribed EAI malfunctions, or when a second dose is needed (Gregory, 2012). The School Access to Emergency Epinephrine Act (S. 1884) was introduced in the U.S. Congress in the fall of 2011 and has received widespread support. The act encourages states to adopt laws requiring that their schools have stock epinephrine for emergencies. As of March 2012, the federal law was still pending, but at least 7 states had similar laws in effect and 6 other states had legislation pending (Gregory, 2012). As of this writing, the bill is still pending in the 113th Congress.

Although adolescent students are usually considered old enough to self-administer epinephrine, they may choose not to carry it with them at all times. In one study, two patients experienced anaphylactic reactions at times when they did not have their prescribed EAI available. This points to the need for periodic checks as well as the need for stock epinephrine in the school building (McIntyre et al., 2005). Classmates of students with allergies should also be taught about what causes allergic reactions, how to recognize the symptoms, and what procedures the school recommends to protect students with allergies (Robinson & Ficca, 2012). Parents, teachers, and students need education to help them understand that they should avoid coercing a child to accept food as could easily happen in classrooms or on field trips (Robinson & Ficca, 2012).

### *Educating School Personnel About Anaphylaxis*

Every member of the school team has a role to play in anaphylaxis management, with the school nurse as the leader of the team. Mechanisms should be in place to ensure the safety

of children in all areas of the school, including on the playground. Playground monitors should be trained to recognize and respond to allergic reactions and to notify the school nurse and other personnel inside the building (McIntyre et al., 2005). Similarly, bus drivers and field-trip chaperones should be trained in recognizing and responding to allergic reactions. On field trips especially, it is important to make sure that precautions are taken to avoid known allergens and that a student-specific emergency care plan, written by the school nurse, along with epinephrine are readily available for students with previously diagnosed allergies (McIntyre et al., 2005). If unlicensed nonmedical personnel (e.g., playground monitors, bus drivers) are not legally authorized to administer epinephrine in that state, it is essential that they be trained to recognize the symptoms of anaphylaxis and to call for emergency medical services immediately if the school nurse is not available (McIntyre et al., 2005).

The National Association of School Nurses (NASN) has developed programs to help school nurses train the entire school staff on food allergies, signs and symptoms of anaphylaxis, reducing allergen exposure, and communication procedures in case of emergency. There is also a second level of training, which includes the administration of epinephrine, for staff members who have frequent contact with students who have food allergies (National Association of School Nurses, 2012b). Some states allow only the registered school nurse to administer the stock epinephrine. It is important to know the scope of practice and restrictions placed on nurses and other school personnel by each state and school district.

An EAI is relatively simple to use, even for children as young as 8 years old, and autoinjectors come with specific training information that can be used to teach supervising adults about proper usage. There are even online downloads and mobile apps available to supplement this kind of training (Gregory, 2012). Staff members should be given the chance to practice with a demonstrator device (Robinson & Ficca, 2012). The EAIs marketed in the United States each have unique steps for proper use, so school nurses, other staff, and/or children should be well acquainted with the correct steps for the particular device used. The device manufacturer's website can be consulted in advance for correct use. In addition, all appropriate staff should be informed of the locations of stock epinephrine, trained on what to say to emergency responders when 911 is called, and reminded to give the used EAI to the emergency responders so that it can be taken to the hospital (Robinson & Ficca, 2012).

### *Sending Patients to the Hospital After Treating Acute Anaphylaxis*

Children with any severe allergic reaction, whether or not they have received emergency treatment, should be sent to the hospital for at least 6 hours of observation (Muraro et al., 2010). It has been estimated that as many as one third

of the children who have had a severe anaphylactic reaction will have a biphasic reaction several hours later. This second-phase reaction often does not respond well to epinephrine alone and requires more extensive treatment available only in an acute care facility. Therefore, the AAAAI recommends that school policies should clearly direct the staff to send patients receiving emergency epinephrine to a hospital (McIntyre et al., 2005).

### **Challenges Faced by School Nurses in Appropriate Care and Prevention of Anaphylaxis**

Many school nurses have experience in managing students with only one or two food allergies, but students with multiple food and/or insect sting allergies are prone to even greater risk of accidental allergen exposure and present increased prevention and management challenges. Meeting this challenge requires communication with the parents and health care providers, as well as education of faculty, staff, and students, to reduce the chance of accidental allergen exposure (Robinson & Ficca, 2012).

All children with food allergies should have an individualized emergency care/action plan for emergencies, and the school nurse is responsible for developing it according to the NASN (Robinson & Ficca, 2012). An individualized plan is critical because the allergic reaction can vary in cause, symptoms, and severity from one child to another. Once an emergency plan is developed for a specific student, it is the responsibility of the school nurse to inform and train all school staff who might come in contact with that student during the school year (Robinson & Ficca, 2012). The NASN website has a tool kit to help school nurses set up a food allergy and anaphylaxis emergency care/action plan at <http://www.nasn.org/ToolsResources/FoodAllergyandAnaphylaxis>. This tool kit was developed jointly by the Centers for Disease Control, the Food Allergy and Anaphylaxis Network (FAAN), and the NSBA. (*Note: As of November 12, 2012, FAAN merged with the Food Allergy Initiative under the name Food Allergy Research & Education [FARE].*)

### **Value of Having a School Nurse Present**

School nurses often have responsibilities in multiple buildings and must therefore delegate some tasks to licensed practical nurses (LPNs) or unlicensed assistive personnel, including teachers, where allowed by law. However, the school nurse remains the expert in maintaining health information for students and training the staff regarding proper care (Robinson & Ficca, 2012). In one case report, a student developed a previously undiagnosed life-threatening allergy while the school nurse was covering another building. Although the nurse was able to get to the patient in time to administer treatment, this experience underscores the need for all school staff to be trained to recognize the symptoms and to call the school nurse and the emergency medical

service immediately (McIntyre et al., 2005). School nurses already play a vital role in managing treatment of students' allergies at school and that role is expected to increase as legislation requiring stock epinephrine goes into effect. It will be critical for the school nurse to manage the supply of stock epinephrine and to train others on device usage (Gregory, 2012). The school nurse is uniquely prepared with the education and experience to coordinate student health care as well as develop and implement comprehensive action plans in conjunction with physician, parents, school staff, and students (National Association of School Nurses, 2012a).

### **Summary and Recommendations**

With the growing prevalence of life-threatening allergic reactions in school-age children, school personnel are increasingly involved in allergy management, including developing policy guidelines, supporting staff training, modifying the cafeteria environment and food offerings, and collecting information on the emergency care/action plans for students with known allergies (National School Boards Association, 2011). The safe and effective management of allergies and anaphylactic reactions in the school setting requires a coordinated and multidisciplinary approach led by the school nurse (National Association of School Nurses, 2012a). Policy makers, educators, families, and health care professionals need to work together to make sure that students with allergies are safe at school so that they can focus on learning (National School Boards Association, 2011).

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## Anaphylaxis Action – Clinical Conversation Topic

### Recognition and Treatment of Anaphylaxis in the School Setting: The Essential Role of the School Nurse



#### Content Considerations

1. What are some of the important differences in the triggers for asthma and anaphylaxis?
2. What is the first line treatment for anaphylaxis? What treatments are not recommended for first-line therapy?
3. What is the recommended dosing for epinephrine? Does this align with the information found in the package inserts for the medication?
4. What two approaches will help the school nurse meet the challenges faced in managing life-threatening allergies?
5. Why does allergen exposure in the school setting demand our attention?
6. Explain the value of a school nurse in anaphylaxis management.

## Anaphylaxis Action – Clinical Conversation Topic

### Recognition and Treatment of Anaphylaxis in the School Setting: The Essential Role of the School Nurse



#### Idea Implementation

1. How can the assessment skills of the registered professional school nurse assist in differentiating the symptoms and triggers of asthma and anaphylaxis?
2. What are some of the issues surrounding the implementation of a stock epinephrine program? Does your state allow stock epinephrine? What are some of the challenges experienced with its implementation?
3. What do you see as the major challenges that school nurses face in managing allergic reactions at school? What strategies would help in handling these challenges?
4. Why is it so important for the school nurse to develop an individualized emergency care plan for students at risk for anaphylaxis?



#### Practice Point

How can the information in this article shape and change your practice of school nursing?

# Clinical Conversations for the School Nurse

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## Food Allergy Management in the School Setting

### Resources and References

#### NASN Resources

##### **NASN Position Document**

National Association of School Nurses (2012). *Allergy/anaphylaxis management in the school setting: position statement*. National Association of School Nurses Online. Retrieved from <http://www.nasn.org/PolicyAdvocacy/PositionPapersandReports/NASNPositionStatementsFullView/tabid/462/smId/824/ArticleID/9/Default.aspx>

##### **NASN Online Tool Kit for Food Allergy and Anaphylaxis -**

<http://www.nasn.org/ToolsResources/FoodAllergyandAnaphylaxis>

- Centers for Disease Control & Prevention - CDC - *Voluntary Guidelines for Managing Food Allergies In Schools and Early Care and Education Programs*
  - School Nurse Checklist
- Checklists
  - Sample District and Support Policy Checklist
  - Sample Care Planning Checklist
  - Sample Staff Training Checklist
  - Sample Fostering Partnerships and Quality Monitoring Checklist
  - Sample School Practices Outcome Evaluation Checklist
  - Sample Plan of Care Outcome Checklist
- Forms
  - Fact Sheet: What School Nurses Need to Know about Parents of Children with Food Allergies
  - Sample School District Anaphylaxis Policy
  - Parent Notification of a Food Allergy in the Classroom Letter - English, Spanish, Somali, Hmong
  - Welcome Back to School Letter – Child with Food Allergy
  - Sample Food Allergy IHP Template
  - AAAAI Anaphylaxis Emergency Action Plan
  - FARE Food Allergy Action Plan / Emergency Care Plan
  - Suggested Nursing Protocol for Students without an Emergency Care Plan
  - Sample Epinephrine Reporting Form
  - Family Allergy Health History
  - NASN Guidelines for Health Personnel in Allergy Management

## NASN Allergy and Anaphylaxis Programs and Resources

- **Get Trained** – program to train school staff to administer epinephrine using an auto-injector - <http://www.nasn.org/ToolsResources/FoodAllergyandAnaphylaxis/GetTrained>
  - Trainer preparation
  - Training Tools
  - Additional Resources
  - Collaborate
  
- **Epinephrine Policies and Protocols** – sample resources to customized for use in your school district - <http://www.nasn.org/ToolsResources/FoodAllergyandAnaphylaxis/EpinephrinePoliciesProtocolsandReporting>
  - Sample Policies
  - Sample Anaphylaxis Protocol
  - Sample Epinephrine Administration Reporting Tool
  
- **Epinephrine Resource School Nurse Program** - <http://www.nasn.org/ToolsResources/FoodAllergyandAnaphylaxis/EpinephrineResourceSchoolNurseProgram>
  - More than 100 Epinephrine Resource School Nurses (ERSNs) around the country.
  - Provides professional development and technical assistance to school nurses and the school community related to epinephrine administration
  
- **Video Series** – a series of three video episodes highlighting important school nursing issues in allergy management - <http://www.nasn.org/ToolsResources/FoodAllergyandAnaphylaxis/SNPPRA/episode1>  
*School Nurses: Partnering to Avoid & Respond to Anaphylaxis*
  - School nurses can play a vital role in helping to avoid and manage an anaphylactic reaction
  - Parental collaboration is critical to creating a safer environment
  - Creating a School-Wide Emergency Response Plan
  
- **Saving Lives at School Connection Cards** - <http://www.nasn.org/ToolsResources/FoodAllergyandAnaphylaxis/SavingLivesatSchoolAnaphylaxisandEpinephrine>
  - A tool for the school nurse to use to initiate meaningful conversations with students and parents on topics related to anaphylaxis and epinephrine

## Resources and References

### National Partner Resources

- Allergy & Asthma Network - AAN
  - <http://www.aanma.org/>
  - Epi Everywhere! Every Day! School-based Anaphylaxis Preparedness video webinar
  - Anaphylaxis Community Experts (ACEs)
- AllergyHome.org
  - Schools at AllergyHome.org
  - <http://www.allergyhome.org/schools>
- American Academy of Allergy, Asthma & Immunology – AAAAI
  - <http://www.aaaai.org/home.aspx>
  - Allergies
- American College of Allergy, Asthma and Immunology – ACAAI
  - <http://www.acaai.org/Pages/default.aspx>
  - Anaphylaxis Overview
- Food Allergy & Anaphylaxis Connection Team - FAACT
  - <http://www.foodallergyawareness.org/>
    - Resources for School Personnel, Parents with an Education Resource and Civil Rights Advocacy Centers
- Food Allergy Management and Education – FAME
  - Children’s Hospital of St. Louis
  - <http://www.stlouischildrens.org/health-resources/advocacy-outreach/food-allergy-management-and-education>
  - FAME Manual and Toolkit
- Food Allergy Research and Education – FARE
  - <http://www.foodallergy.org/>
  - For School Professionals
- National Education Association – Health Information Network – NEA HIN
  - <http://www.neahin.org/>
  - The Food Allergy Book: What School Employees Need to Know
- National School Boards Association - NSBA
  - <http://www.nsba.org>
  - Safe at School and Ready to Learn: A Comprehensive Policy Guide for Protecting Students with Life-Threatening Food Allergies

# Clinical Conversations for the School Nurse

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## Food Allergy Management in the School Setting

### Acknowledgements

All articles and resources presented are based on best practices. Each school nurse must exercise independent professional judgment when practicing and conducting training. Because nurse practice acts differ from state to state, each school nurse must ensure before presenting the training that it is consistent with applicable state laws and regulations, including those governing delegation, as well as applicable school district policies and procedures.

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