Food Allergies: Managing and Preventing Acute Reactions in the School Setting

The following best practice guideline was created as part of the Developing a School Health Services Assessment Tool and Related Resources Project. This project is funded by Healthier Wisconsin Partnership Program, a component of the Advancing a Healthier Wisconsin endowment at the Medical College of Wisconsin.

The Food Allergy Best Practice Guideline has incorporated state and federal requirements along with best practice recommendations. Although it would be best practice to implement all the components of the guideline in your school district, we are aware that district capacity, resources and other factors may result in adoption of portions of the guideline.

We encourage you to meet as a team within your district to review the guideline and identify what components of the guideline you are currently doing in your district. If you have the capacity to expand upon what you are currently doing, review the guideline to identify what other practices you would be able to implement.

Throughout the school year, we invite you to take notes using the following page(s). We suggest noting attendees and dates of meetings that you hold related to the guideline. Noting discussions that you had during those meetings, identified next steps and additional information you would find helpful to share. These notes will be beneficial when you are asked to complete the evaluation surveys and participate in the site visit interviews with the project staff.

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Notes:

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Background

The number of children diagnosed with food allergies has increased significantly. In 2007, an estimated 3 million children under age 18 years (3.9%) had a reported food allergy, which was 18% higher than in 1997 [43]. A food allergic reaction is an abnormal response by the immune system where an allergen triggers an IgE antibody response (a type I hypersensitivity reaction) with release of inflammatory mediators such as histamine. A food allergic reaction may be mild, or it can be associated with anaphylaxis, a potentially life threatening reaction *(NIAID web page)*. Mild food allergic reactions, such as itchy mouth, some hives, mild upset stomach, are often treated with nonsedating antihistamines, such as cetirizine or Zyrtec®[38]. The food allergy action plan for each child will provide the treatment recommendations for both mild and severe reactions.

The rest of this resource tool will focus on management of anaphylaxis in the school setting.

What is Anaphylaxis?

Anaphylaxis is an acute and potentially lethal multi-system allergic reaction, which can occur within minutes (most commonly) to 1-2 hours after exposure to the allergenic food protein. Severe food allergic reactions occur when the allergenic protein comes in contact with a mucous membrane through ingestion or rarely inhalation. Skin contact with allergens is unlikely to lead to severe reactions. The most commonly implicated foods responsible for food-induced anaphylaxis include: peanuts, tree nuts, fish, shellfish, cow's milk, soy and egg [2].

Anaphylaxis can present with some or all of the following signs and symptoms:

Skin: diffuse erythema, pruritus, urticaria, and/or angioedema
Respiratory: bronchospasm, laryngeal edema
Cardiac: hypotension, cardiac arrhythmias, shock
Neurological: feeling of impending doom, unconsciousness

Other earlier or related signs and symptoms can include:

Respiratory: itchy nose, rhinorrhea, change in voice
Gastrointestinal: nausea, vomiting, diarrhea, abdominal cramps and bloating
Neurological: lightheadedness, headache
Other: generalized warmth, itchy eyes, pharynx, genitalia, palms, and soles, uterine cramps

Avoidance and Rapid Treatment

The principles for successful management of food allergies are avoidance and preparedness for the treatment of acute allergic reactions [50]. Expert opinion for the past 30 years has held that epinephrine is the drug of choice and the first drug that should be administered in acute anaphylaxis [33,39]. Prompt use of injectable epinephrine has been shown to be effective in the initial management of anaphylaxis, but subsequent doses may be needed due to the risk of biphasic reactions [21,42]. Biphasic reactions can occur following the initial anaphylactic episode and usually occur within 4 to 10 hours of an allergic reaction. This second wave of symptoms can occur even in children and adults who were appropriately treated with epinephrine [43]. Research has shown that that the delay of epinephrine administration contributes to the incidence of biphasic reactions [18] and fatal anaphylactic reactions in teenagers and young adults [21]. **Expert consensus indicates that when in doubt, the best option is to administer epinephrine** [2,5,7,8,9,12,14,16,17,23,36,43,44,47,48,49,50].

Anyone can be at risk for an anaphylactic allergic reaction. Studies have shown that over 20% of people with no prior diagnosis of anaphylactic food allergy had their first anaphylactic allergic reaction at school. During the 2003-04 school year, the Massachusetts School District reported administering 122 epinephrine doses via EpiPen; 22.6% of the adults and children who received epinephrine had no previous diagnosis of food allergy [42]. This underscores the need for school districts to have policies and procedures that allow for the use of non-patient specific epinephrine. In addition to providing training to all school staff on the signs and symptoms of anaphylaxis, school districts should also provide instruction to everyone on how to use an epinephrine auto-injector. (There are a number of epinephrine auto-injectors, and school personnel need to be familiar with the different types. The medication is the same, however, so that epinephrine from different sources can be used safely sequentially.)

How to Use the Recommendations:

The following are recommendations compiled from available evidence and leading experts in the areas of allergy and anaphylaxis, school nursing and pediatrics. (For details on the methods used in the development of these recommendations, see the Methods section at the end of this document).

The purpose of these guidelines are to provide school administrators, school nurses and staff with information, recommended policies, procedures and resources to ensure that students have a safe learning environment.

The recommendations are outlined as action steps for schools and school districts. Knowing that every school district is unique, we did not identify who should be responsible for implementing the recommendation, and districts should work as a team to identify who is the most appropriate staff person.

Although implementation of all the following standards is the best practice, we understand that it may not be possible for school districts to implement every recommendation. We have identified which of the following recommendations are federal or state mandates. Regardless of district staffing, those recommendations would be required.

Recommendations

Staffing:

1. The school district employs Baccalaureate level prepared registered nurse (RN) to conduct and supervise school health programs [3,32]
2. The school district RN staffing meets minimum requirements based on the following formula-based approach: 1:750 for students in the general population, 1:225 in the student populations requiring daily professional school nursing services or interventions, 1:125 in student populations with complex health care needs, and 1:1 may be necessary for individual students who require daily and continuous professional nursing services [3,10,20,27,31,33,36,42,46]
3. The school district has an established relationship with a medical advisor* [3,21]

Preparedness:

4. Implement a process to collect health related information from students on at least a yearly basis (such as registration form) [2,7,9,10,25]
5. Students with known food/insect or anaphylactic allergy should have individualized health plan (IHP) which includes prevention (allergen avoidance) and emergency preparedness (anaphylactic plan developed by student's healthcare provider including field trip management) [2,3,4,5,7,9,10,12,13,14,15,19,20,21,22,23,24,25,26,27,33,34,35,37,39,41,43,44,45,46,47,48,49,50].
6. Include a picture of the student with the student's IHP [2,5,7,14,25,33]
7. The IHP is distributed to everyone who has regular interaction with the student being careful not to compromise confidentiality [2,3,4,5,7,9,10,12,13,14,15,19,20,22,23,24,25,26,27,34,35,37,39,41,43,44,45,46,47,48,49,50]
8. The school district medical advisor provides school district with a standing non-patient specific order for epinephrine to be administered to any student* who appears to be experiencing an anaphylactic emergency [7,10,11,20,21,26,28,29,30,36,42,43,49,50,53]
9. The school district medical advisor provides school district with a standing non-patient specific order for epinephrine to be administered to any staff member in an anaphylactic emergency

   (Current state law allows for the administration of epinephrine to a student who appears to be having an anaphylactic reaction without the requirement of a non-patient specific standing order. ***A standing non-patient specific order would be required to administer epinephrine to a staff member****)*
10. School district has a policy for the administration of epinephrine to any staff member who appears to be having an anaphylactic reaction

11. Emergency preparedness plan (anaphylaxis management plan) indicates whether a repeated dose should be given after 5 to 15 minutes if the student responds poorly to the initial dose of epinephrine or has ongoing or progressive symptoms and emergency medical services have not arrived [7,8,16,18,25,36,42,48,49]

12. Identify someone (such as the school nurse) to maintain a schedule for tracking medication status and expiration dates [2,5,7,8,9,11,14,20,22,23,25,43,45,47,48,50]

13. Establish an emergency management team which consists of sufficient school staff within each building who are designated and trained to handle emergencies according to established protocols that such emergencies can be handled at any time the nurse, physician, or other emergency personnel can assume management of the emergency [4,5,7,11,13,14,19,20,23,25,35,43,45,48,52,54]

14. Develop an emergency Shelter-In-Place (see Resources for Shelter-In-Place planning resources) plan, in collaboration with emergency management team, at the beginning of each school year [9,11,23,28,50]

15. Develop a written emergency response plan, in collaboration with emergency management team, that outlines emergency procedures for managing life-threatening allergic reactions for each school building [2,4,5,7,9,10,13,14,22,23,28,35,36,37,19,43,45,49,50,53]

16. Each school's emergency management team practices a life-threatening allergic reaction drill at least yearly and reviews the steps and implementation of the emergency management plan at least quarterly [2,5,7,8,9,13,14,20,23,35,37,43,45,48,50]

17. All school facilities within the district, including school buses, have an efficient and effective campus-wide communication system (PA system, cellular phones, walkie-talkies) [5,7,9,13,14,19,20,21,33,35,36,37,45,47]

Policy:

18. School district has developed a policy to address management of food allergies in the school setting [7,14,21,26,28,29]

19. School district has a policy for the administration of epinephrine to any student who appears to be having an anaphylactic reaction [9,21]

20. District policy allows school personnel trained in the appropriate use of epinephrine to administer to a student (with or without previously diagnosed anaphylaxis) for the treatment of anaphylaxis* [5,7,9,10,11,21,28,43,48]

21. District policy includes the requirement that 911 should be called when someone requires the administration of epinephrine and that person should be transported to the emergency department via ambulance* [2,5,7,8,9,11,14,15,19,20,21,23,25,26,33,34,36,42,43,44,45,46,47,48,50,52]

22. District policy states that school employees are not liable for negligence in administering epinephrine to any student or school personnel they believed to be having an anaphylactic reaction* [10,11,25,52]

23. District policy includes a standard procedure for documenting, tracking and reporting of emergency events [7,19,21,35,45,48]

24. Debrief and discuss the development and management of all anaphylactic episodes with emergency management team, parents/guardians, student (age appropriate), and physician as soon as possible after the event has been resolved. Review policies and protocols with an eye to recognizing things that went well, and to fixing the system to help make things go better in the future. [7,9,10,13,14,20,23,28,33,36,42,43,45,47,48,49,50]

25. School district policy prohibits students from bringing food containing the relevant allergen to school to share with the classroom for celebratory functions (such as birthdays) in classrooms with food allergic children [20,24,35,42,46,50](Sample parent letter)

26. School district has a "No Bullying" policy and encourages students who are bullied to report such behaviors [5,7,10,14,20,23,28,33,35,36,39,43,49,50]

27. School district implements a "No Food Sharing" policy [2,5,7,9,11,12,19,22,23,24,25,35,36,43,45,47,49,50,51]

28. School district implements a "No Eating on the Bus" policy with appropriate medical considerations and exceptions for student who require food (such as those with diabetes) [7,9,10,20,23,36,43,45,47,49]

29. Involve school food services leadership in developing district policies regarding food allergy [43,45,47,50]

Medication

30. Emergency medications should be stored in a reasonably accessible location:

    a. Medication should be kept in a secure but unlocked area that is clearly labeled "EpiPens for "Severe Allergic Reactions"
    b. Staff should be aware of the storage locations, and of any back-up supply , and all of these should be labeled as above.
    c. Students may be allowed to carry their own emergency medication (injectable epinephrine) when appropriate* and school-provided back-up epinephrine should always be available.
    d. Students should have access to emergency medications (injectable epinephrine) during field trips, school sponsored events (sporting, before and after school, summer school) and school-provided back-up epinephrine should be available. [2,4,5,7,8,9,10,12,13,14,15,19,20,21,23,25,26,28,35,39,41,43,45,47,49,51]

31. District requests that students diagnosed with anaphylactic allergy have immediately available at least two doses of epinephrine while at any school function or facility [7,12,14,19,20,43,47,48] ***(Be sure to remove the epinephrine trainer from box to prevent school staff from mistakenly using that during an anaphylactic emergency)***

32. District maintains a supply of at least two stock doses of 0.15 mg and 0.3 mg epinephrine at each school building within the school district (Auto injector dosing for epinephrine is 0.15 mg for children who weigh 10 to 25 kg and 0.3 mg for those who weigh >25 kg [8,16]) [7,9,11,21,26,28,30,35,43,48,49,50] ***(Be sure to remove the epinephrine trainer from box to prevent school staff from mistakenly using that during an anaphylactic emergency)***

Training and Education

33. School district provides yearly training on food allergy and epinephrine use to:
    a. school faculty and staff
    b. substitute teachers
    c. school bus drivers
    d. cafeteria staff
    e. playground monitors
    f. before and after school staff
    g. coaches [1,2,4,5,7,9,11,12,13,14,19,20,21,22,23,24,25,26,28,29,33,35,39,41,43,45,47,48,50,51]

34. Assure that all staff understand the following components of food allergies:
    a. can recognize symptoms
    b. knows what to do in an emergency
    c. understands the risk for biphasic reactions and the need to call 911 and transport to emergency department
    d. works with other school staff to eliminate the use of food allergens in educational tools, arts and crafts projects, or incentives[2,5,7,9,10,12,13,14,19,20,21,22,23,24,25,26,28,29,33,34,35,39,41,43,45,48,50,52,54]

35. Educate school staff that epinephrine should be administered promptly at the first sign of anaphylaxis (It is safer to administer epinephrine than to delay treatment for anaphylaxis) [2,5,7,8,9,12,14,16,17,23,36,43,44,47,48,49,50]

36. Educate school staff that student's emergency plan may call for a second dose of epinephrine if a person having anaphylaxis responds poorly to the initial dose of epinephrine or has ongoing or progressive symptoms, repeated dosing may be required after 5 to 15 minutes. (Staff should follow student's emergency preparedness (anaphylactic plan) or the non-patient specific standing order) [7,8,14,16,18,36,43,49,50]

37. Educate school staff on how to read labels including food and items used in craft and classroom projects [2,5,9,12,33,34,51]

38. Educate school staff on strategies to manage student privacy/confidentiality while maintaining an inclusive class environment, rather than one that might ostracize students with allergies [4,7,9,28,29,50]

39. Provide school staff CPR/AED training [2,12,13,14,23,36,37,45,51]

40. Maintain documentation of school staff training including attendee names, dates and topics [5,9,11,14,19,20,28,45]

41. School nurse documents competence of staff who are designated to administer epinephrine [11,14,19,20,28,29,45]

42. School nurses complete yearly professional continuing education on management of life threatening emergencies including anaphylactic reactions [22,28,29,37,39]

Food Management

43. Consider have an "Allergen Aware" table to allow children to sit with their friends who are eating safe meals (instead of secluding all children with food allergies to one table) (being careful not to compromise confidentiality) [5,7,12,14,20,23,24,33,35,36,43,45,47,51]

44. Clean eating areas with soap, wet wipes, or commercial wipes but not with dishwashing liquid alone after each meal [2,5,7,9,11,12,14,19,20,23,28,33,35,36,39,43,45,49,50] (More info on cleaning tables)

45. Have children and adults clean hands using running water and soap or commercial wipes but not antibacterial gels alone [2,7,9,11,12,14,19,20,23,28,33,35,38,43,45,47,50]

46. Have food service leadership assist in the education of cafeteria/food service staff at the individual school level [7,9,23,42,44,46,49]

47. Schools make substitutions or modifications in school meals for children with food allergies when a health care provider prescribes substitutions due to a food allergy that may result in severe, life-threatening (anaphylactic) reactions [2,7,9,12,14,33,46] ^

Classroom Management

48. Consider removal of highly allergenic foods from the vicinity of kindergarten-aged children or children with significant developmental disabilities with food allergies when transfer of the allergen among the children is likely [13,33,39,43,50]

49. Provide education (additional resource) to classmates regarding allergen avoidance and recognition of food allergy reactions being careful not to compromise confidentiality [7,12,25,33,39]

50. Institute a process to notify substitute teachers about students who have anaphylactic food allergy including access to students IHP, emergency management plan, and epinephrine auto-injectors [5,7,9,14]

51. Reduce or avoid using food in lesson plans such as art or math [2,5,7,9,14,25,50]
(Non-food items that may contain allergens include modeling clay, finger paints, science kits, papier-mâché, crayons, seeds, and more)

52. Ensure pet food is free of offending allergens by checking food labels (if applicable) [9,33]

53. Consider food allergies when planning for field trips, and be sure to include the school nurse and parents early in the planning process [1,5,7,9,12,14,21,29]

*Current Wisconsin law
^Current federal law

Methods

A literature search of ProQuest (2000 to present) was conducted using the keywords anaphylaxis, children and schools. 381 articles were retrieved. Published works that that included recommendations for management of food allergies in the school setting were included. An additional search of CINAHL and Medline using the keywords anaphylaxis and school was conducted. 31 and 23 articles respectively, were reviewed. Review of National Association of School Nurse's Food Allergy Resources for School Nurses Literature Review was also accessed and cross-referenced. In addition, the following references were cross-referenced:

- NIAID-Sponsored 2010 Guidelines for Managing Food Allergy: Applications in the Pediatric Population [8],
- Anaphylaxis Management Recommendations for Primary Care [51],
- Managing the Student with Severe Food Allergies [39],
- Impact of Food Allergies on School Nursing Practice [52].

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Resources:

Allergy Ready: Back to School: Our online course is designed to help teachers, administrators and other school personnel prevent and manage potentially life-threatening allergic reactions.
http://allergyready.com/

American School Health Association: Webinar: Food Allergy Safety at School
If you don't know how to prevent food allergy reactions at school, or how to respond to a severe reaction, this free webinar can help you be more proficient, and even save a child's life. Leaders in food allergy prevention and treatment will share their valued expertise. The webinar is a collaborative effort between ASHA, the ELL Foundation, and the National Association of School Nurses.
http://www.ashaweb.org/i4a/pages/index.cfm?pageid=3439

The Food Allergy and Anaphylaxis Website: Guidelines and downloadable resources
http://www.foodallergy.org/section/helpful-information
Food Allergy Action Plan
http://www.foodallergy.org/files/FAAP.pdf

Illinois State Board of Education and Illinois Department of Public Health: Guidelines for managing food allergies in Illinois schools
http://www.isbe.state.il.us/nutrition/pdf/food_allergy_guidelines.pdf

Massachusetts Department of Education: Managing Life Threatening in Schools Food Allergies
www.doe.mass.edu/cnp/allergy.pdf

NASN: Online Food Allergy and Anaphylaxis Toolkit: The Centers for Disease Control has worked with NASN, the Food Allergy & Anaphylaxis Network and the National School Boards Association to develop comprehensive guidance and resources for food allergy and anaphylaxis management in the school setting. http://www.nasn.org/ToolsResources/FoodAllergyandAnaphylaxis

NASN: Get Trained: Get Trained © is a program intended to be used as a tool and resource for scripted training of unlicensed school staff to administer epinephrine via an auto injector during an anaphylactic emergency. The program recommendations and content 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.
http://www.nasn.org/ToolsResources/FoodAllergyandAnaphylaxis/GetTrained

NASN: Food Allergy Resources for School Nurses - Literature Review
http://www.nasn.org/portals/0/resources/faat_literature_review.doc

NEA Health Information Network: Food Allergy Book: What School Employees Need to Know

At any time, school staff may need to respond to a food allergy emergency—whether in the classroom or cafeteria, or on the playground, athletic field, or school bus. That's why it's important for educators to know about food allergies and understand their role in helping to prevent and respond to allergic reactions in schools. This pocket-sized resource covers:

- What are the most common foods that might trigger an allergic reaction?
- What are the signs and symptoms of a severe, life-threatening allergic reaction?
- What is anaphylaxis?
    - What is your role in helping to manage food allergies in schools

http://www.neahin.org/assets/pdfs/foodallergybook_english.pdf

Shelter-in-Place Planning Resources:

- Practical Information on Crisis Planning: A GUIDE FOR SCHOOLS AND COMMUNITIES http://rems.ed.gov/docs/PracticalInformationonCrisisPlanning.pdf
- St. Louis Hospital: Food Allergy Management and Education http://www.stlouischildrens.org/health-resources/advocacy-outreach/food-allergy-management-and-education