THE EFFECTS OF AN EVIDENCE-BASED FOOD ALLERGY MANAGEMENT PLAN TO KEEP CHILDREN WITH FOOD ALLERGIES SAFE AT SCHOOL

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No Disclosures
Objectives

• Identify key factors to keeping children with allergies safe
• Understand recommendations for school implementation
Background

- Prevalence in children has increased 18% from 1997 to 2007

- 30,000 visits to the emergency room each year related to food allergies

- More than 200 deaths will occur in the US this year from food allergies

(ALLERGY AND ASTHMA FOUNDATION OF AMERICA, 2014)
- One in 13 kids has a food allergy
- Average classroom has 2 kids with food allergies
- 5.9 million kids with food allergies

(Food Allergy Research and Education, 2014)
School Issues

• 84% of children who have food allergies will experience an allergic reaction while at school

• Reactions are unpredictable in nature and severity
  – A child who experienced a mild reaction from a food trigger may quickly experience anaphylaxis with secondary exposure (Powers, Bergren, & Finnegan, 2007)

• Literature shows often the child is not prepared with emergency care plan (ECP) or required medications
Evidence-Based Practice Project

• Project developed for local charter school
  – School in Northwest, IN
  – 500 students, K to 8th grade
  – 18 children with food allergies Spring 2014; 22 children with food allergies enrolled Fall 2014
“In the elementary school setting, how does implementation of a revised food allergies management policy affect staff adherence to best practice recommendations and students’ episodes of food allergy reactions over a 4 month period?”
Literature Review

- Conducted to gather evidence
- Sought to identify safety measures related to food allergy management in school
  - Multiple types of evidence was found
Key terms used
- Food allergy
- Food hypersensitivity
- Peanut allergy
- Education
- School
- Class
- Teacher
- School nurse
- School health nursing

Inclusion criteria
- Less than 10 years old
- English language
- Peer reviewed
## Review of Literature

<table>
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<tr>
<th>Database</th>
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<td>2</td>
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<td>ProQuest</td>
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<td>5</td>
<td>4</td>
<td>0</td>
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<td>Nat Guideline Clearinghouse</td>
<td>4</td>
<td>0</td>
<td>0</td>
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<td><strong>Total</strong></td>
<td><strong>14</strong></td>
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Levels of Evidence

John Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal & Non-Research Evidence Appraisal Tools

- **Level 1**: 0 (experimental)
- **Level 2**: 1 (quasi-experimental)
- **Level 3**: 9 (non-exp, qual, & metasyn)
- **Level 4**: 0 (sys reviews & clinical prac guidelines)
- **Level 5**: 4 (org, expert opinion, case study, & lit reviews)
Decision to Change Practice

- Best practice for management of food allergies in the school setting remains complete avoidance of trigger foods for the affected child (Carlisle et al., 2010; Cavanaugh & Strickland, 2011; Gupta, 2014; Weiss et al., 2014).

- Food allergies and anaphylaxis demonstrate a wide variability in symptoms and triggers. Each student should have their own emergency care plan available at all times with required medications (Carlisle et al., 2010; Cavanaugh & Strickland, 2011).

- Evidence supports staff education regarding food allergies in school systems (Weiss et al., 2004; Young et al., 2004).
Implementation

Setting and Sample:
- Local charter school
- Children with food allergies in grades K to 8

Theoretical Frameworks:
- Adult Learning Theory & ACE Star Model

Intervention:
- Policy development with educational in-service

Outcomes:
- Primary - Food allergy reactions
- Secondary - Policy compliance
Best Practice Project

Policy Development
- Avoidance
- ECP/ Medication
- Staff Education
Food Allergy & Anaphylaxis Emergency Care Plan

Name: ___________________________ D.O.B.: ___________________________

Allergy to: ___________________________

Weight: __________ lbs. Asthma: [ ] Yes (higher risk for a severe reaction) [ ] No

NOTE: Do not depend on antihistamines or inhalers (bronchodilators) to treat a severe reaction. USE EPINEPHRINE.

Extremely reactive to the following foods: ___________________________

Therefore:
[ ] If checked, give epinephrine immediately for ANY symptoms if the allergen was likely eaten.
[ ] If checked, give epinephrine immediately if the allergen was definitely eaten, even if no symptoms are noted.

For ANY of the following:

Severe Symptoms:

Lung
- Short of breath, wheezing, repetitive cough

Heart
- Pale, blue, faint, weak pulse, dizzy

Throat
- Tight, hoarse, trouble breathing / swallowing

Mouth
- Significant swelling of the tongue and/or lips

Skin
- Many hives over body, widespread redness

Gut
- Repetitive vomiting, severe diarrhea

Other
- Feeling something bad is about to happen, anxiety, confusion

OR a combination of symptoms from different body areas

1. INJECT EPINEPHRINE IMMEDIATELY.
2. Call 911. Tell them the child is having anaphylaxis and may need epinephrine when they arrive.
   - Consider giving additional medications following epinephrine:
     - Antihistamine
     - Inhaler (bronchodilator) if wheezing
   - Lay the person flat, raise legs and keep warm. If breathing is difficult or they are vomiting, let them sit up or lie on their side.
   - If symptoms do not improve, or symptoms return, more doses of epinephrine can be given about 5 minutes or more after the last dose.
   - Alert emergency contacts.
   - Transport them to ER even if symptoms resolve. Person should remain in ER for at least 4 hours because symptoms may return.

Mild Symptoms:

- Nose: Itchy/nuffy nose, sneezing
- Mouth: Itchy mouth, mild itch
- Skin: Mild nausea, mild itch, mild discomfort

For mild symptoms from more than one system area, give epinephrine.

For mild symptoms from a single system area, follow the directions below:
1. Antihistamines may be given, if ordered by a healthcare provider.
2. Stay with the person; alert emergency contacts.
3. Watch closely for changes. If symptoms worsen, give epinephrine.

Medications/Doses:

Epinephrine Brand: ___________________________

Epinephrine Dose: [ ] 0.15 mg IM [ ] 0.3 mg IM

Antihistamine Brand or Generic: ___________________________

Antihistamine Dose: ___________________________

Other (e.g., inhaler/bronchodilator if wheezing): ___________________________

Parents/Jurian Authorization Signature: ___________________________ Date: __________
Physician/NeP Authorization Signature: ___________________________ Date: __________

Form provided courtesy of Food Allergy Research & Education (FARE) (www.foodallergy.org) 6/2014
Educational In-Services

• 4 educational in-services were held that educated staff and volunteers. \((n=115)\)
  – PowerPoint Presentation
  – Demo and Return Demo by all participants of two common epinephrine auto-injectors
Primary Outcomes

Comparison of Reactions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre</th>
<th>Post</th>
<th>t</th>
<th>df</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Reactions</td>
<td>.2222 (.54832)</td>
<td>.2727 (.76730)</td>
<td>-.234</td>
<td>38</td>
<td>.816</td>
</tr>
</tbody>
</table>
# Secondary Outcomes

## Policy Compliance

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Pre (n)</th>
<th>Post (n)</th>
<th>$\chi^2$</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECP on file</td>
<td>(15) 83.3%</td>
<td>(20) 91.0%</td>
<td>.519</td>
<td>.471</td>
</tr>
<tr>
<td>Recommended ECP on file</td>
<td>(15) 83.3%</td>
<td>(19) 86.4%</td>
<td>.071</td>
<td>.471</td>
</tr>
<tr>
<td>Rec meds available</td>
<td>(8) 44.4%</td>
<td>(12) 54.5%</td>
<td>.404</td>
<td>.525</td>
</tr>
<tr>
<td>Meds traveled with student</td>
<td>(1) .05%</td>
<td>(12) 54.5%</td>
<td>10.831</td>
<td>.001*</td>
</tr>
</tbody>
</table>

* $p < .05$

* * = $p < .01$
### Evaluation of Educational In-Service Likert-type Questions

#### Survey Item Responses ($n$) %

<table>
<thead>
<tr>
<th>Item</th>
<th>SD</th>
<th>D (%)</th>
<th>N (%)</th>
<th>A (%)</th>
<th>SA (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor knowledge</td>
<td>(1) 0.9%</td>
<td>0</td>
<td>0</td>
<td>(8) 7%</td>
<td>(93) 88.7%</td>
</tr>
<tr>
<td>Well developed/ easy to understand.</td>
<td>(1) 0.9%</td>
<td>0</td>
<td>(2) 1.7%</td>
<td>(9) 7.8%</td>
<td>(90) 78.3%</td>
</tr>
<tr>
<td>Instructor communication</td>
<td>(1) 0.9%</td>
<td>0</td>
<td>(2) 1.7%</td>
<td>(5) 4.3%</td>
<td>(94) 81.7%</td>
</tr>
<tr>
<td>Policy was clearly explained</td>
<td>(1) 0.9%</td>
<td>0</td>
<td>(3) 2.6%</td>
<td>(13) 11.3%</td>
<td>(85) 73.9%</td>
</tr>
<tr>
<td>Identification of the signs of reaction</td>
<td>(1) 0.9%</td>
<td>0</td>
<td>(1) 0.9%</td>
<td>(24) 20.9%</td>
<td>(76) 66.1%</td>
</tr>
<tr>
<td>Administration the Auvi-Q auto-injector</td>
<td>(1) 0.9%</td>
<td>0</td>
<td>(2) 1.7%</td>
<td>(11) 9.6%</td>
<td>(86) 74.8%</td>
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<tr>
<td>Administration EpiPen auto-injector</td>
<td>(1) 0.9%</td>
<td>0</td>
<td>0</td>
<td>(12) 18.3%</td>
<td>(89) 77.4%</td>
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<tr>
<td>Policy guidelines manageable</td>
<td>(1) 0.9%</td>
<td>(1) 0.9%</td>
<td>(2) 1.7%</td>
<td>(21) 10.4%</td>
<td>(77) 67%</td>
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<tr>
<td>Increase in knowledge</td>
<td>(1) 0.9%</td>
<td>(1) 0.9%</td>
<td>(2) 1.7%</td>
<td>(17) 14.8%</td>
<td>(80) 69.6%</td>
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<tr>
<td>Increased confidence</td>
<td>(1) 0.9%</td>
<td>(1) 0.9%</td>
<td>(2) 1.7%</td>
<td>(26) 22.6%</td>
<td>(72) 62.6%</td>
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### Responses to Open-ended Evaluation Items

<table>
<thead>
<tr>
<th>Questions</th>
<th>Responses</th>
<th>(n) %</th>
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<tbody>
<tr>
<td>1. What did you find most useful about the presentation?</td>
<td>Hands on demo of auto injectors</td>
<td>(34) 29.6%</td>
</tr>
<tr>
<td>2. How might the presentation be improved?</td>
<td>NA/ No response/ No rec.</td>
<td>(83) 72.3%</td>
</tr>
<tr>
<td>3. How will participation in this pres change how you deal with the child with food allergies?</td>
<td>Increased confidence/ better awareness</td>
<td>(45) 39.1%</td>
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</table>
Conclusions

• No significant difference in incidence of food allergy reactions after policy implementation

• Adherence to recommended practice increased after policy implementation with one parameter, *medications traveled with student*, reflecting a significant difference

• Implementation of policy based on best practice provides a safer environment for the child with food allergies
Strengths/ Limitations

• Strengths
  - High participation rate
  - Use of best practice recommendations and evidence

• Limitations
  – Small sample size
  – Short timeframe
Recommendations

• Continue policy monitoring to assess outcome changes over longer time period

• Expand policy to include other schools in system

• Update policy recommendations with new evidence to reflect most current guidelines
Acknowledgments

• Valparaiso University
• Sigma Theta Tau International- Zeta Epsilon Chapter

*Special Dedication to Lilly Spain*
Questions & Answers...

Academic Center for Evidence Based Practice (ACE). (2012). *University of Texas Health Science Center*. Retrieved from www.acestar.uthscsa.edu


