Implementing a Universal Emergency Response Protocol with Stock Epinephrine for Anaphylaxis in Hawaii Schools

Kari Wilhite

Capstone

MSN

Family Nurse Practitioner

College of Health and Society

Hawaii Pacific University

Honolulu, Hawaii

Summer Semester 2018

Disclaimer: The views presented here are those of the author and are not to be construed as official or reflecting the views of Hawai'i Pacific University

Advisor: Dr. Diane Knight

Issue Statement

There will be lower childhood mortality and morbidity due to food related anaphylaxis, if there are well-defined protocols with stock epinephrine availability for emergency response in place in Hawaii Schools.

Abstract

Hawaii is the only state without a stock epinephrine law in place. Childhood fatalities occur during episodes of childhood anaphylaxis. Up to 20% of the episodes of childhood anaphylaxis occur at school and are the child's first occurrence for the allergy. Childhood anaphylaxis is increasing annually. Mortality and morbidity is lessened with the rapid appropriate response of epinephrine during episodes of childhood anaphylaxis. Change is necessary to include a universal emergency response program including stock epinephrine in Hawaii schools. The use of John Kotter's steps of change in organizations, gives a framework to accomplish the change needed in Hawaii. A method for legislative change and for implementing a pilot program using change theory is described in this article. The pilot program would be set up comprehensively to

allow for reporting data to be sent to a central location. The analysis of the data will be used to further research and to determine the success of the pilot program. Once the pilot program has been successfully implemented and evaluated, the program can be expanded statewide.

Key Words: Childhood Anaphylaxis, Stock Epinephrine, Pilot Program, and Change Theory.

Opening

"Help Ms. Wilhite, I feel like something is wrong!" Tehani, a 15 yr. old student says as she runs into the Health Center. She has just run a mile in 75-degree heat at afternoon track practice. She is flushed, perspiring and out of breath. While calming her, I asked what she meant. She replied that she did not know, but during her run she got really scared and her stomach hurt. She denied any recent illness, current menses, asthma, allergies, diabetes, and history of seizures, anxiety, or syncope. She got progressively anxious over the next five minutes. On physical exam, she was flushing, with piloerection, diaphoresis, and a much-increased respiratory rate. She had eaten Shrimp Chips before track practice.

As an RN there are those moments when you are stuck between what you can do legally, and what you know you need to do for the patient. This time I chose to do what I needed to do. I grabbed another student's Epi-Pen and injected Tehani's thigh with it, while calling 911. Tehani was improving and breathing easier by the time the ambulance arrived. After going to the ER, she found out that the Shrimp Chips she had eaten caused her to go into anaphylaxis,

although she had never had a food allergy before. She was treated in the ER and was not admitted. Thankfully she was back at school the next day, healthy and completely recovered.

Tehani is not unusual. Up to 25% of reported anaphylaxis are first time episodes and occur at school (Greenhawt, M. et al, 2018).

Background

Anaphylaxis is a life-threatening medical emergency that requires prompt response with epinephrine (Sicherer, S. H., Simons, F., 2017). It is known that 150 people die annually due to food related anaphylaxis (Dinakar, C. 2012). Rates of childhood anaphylaxis (CA) are rising steadily (Feuille, E. et al, 2017). Among the children 5-17 years of age, Emergency Department admissions has risen 196% from 2005-2014 (Motosue, M. S. et al, 2017). One out of every thirteen children in school has at least one food allergy, which may lead to anaphylaxis, and 30% of those have multiple food allergies (Gupta, R. et al 2011). Children having co-morbidities such as asthma, have a higher incidence of overall morbidity (Friedlander, J. L. et al, 2013). Hawaii has a childhood asthma rate of 13.6% (State of Hawaii, 2012).

While food allergies may seem manageable through nut free environments, research done in Massachusetts showed such policies did not impact the number of pediatric anaphylaxis episodes (Bartnikas, L. M. et al, 2017). Furthermore, other common foods such as milk and eggs cause high rates of anaphylaxis; so controlling a school environment to be “nut free” is not sufficient (Gaspar, A. et al, 2015).

Epinephrine via Epinephrine Automatic Injectors (EAI) is the drug of choice to treat CA (Boyce. J., et al, 2011). Rapid assessment and appropriate response with epinephrine is life saving and decreases patients’ need for further medications and hospitalization (Fleming, 2015). Patients with rapid epinephrine injections fared better than those who could not access an EAI.

However of those who have prescribed EAIs, up to 48% did not use them during episodes of anaphylaxis, due to lack of access (Dudley, L. et al, 2015). Even with economic incentives, up to 46% of patients failed to consistently carry their EAIs (Cannuscio, C. et al, 2015). The American Heart Association has clearly shown decreased mortality and morbidity with public access defibrillators; if EAIs were similarly accessible, imagine the public health benefits (Murakami, Y. et al 2014).

Hawaii schools should have well developed protocols for CA. The established protocol should include easily accessible stock epinephrine. Currently, epinephrine is only available in a school if one of the student's has a known allergy and their medical provider has prescribed an EAI. According to primary research done in New York (NY) in 2016, over 20% of the episodes of anaphylaxis in NY schools were first time occurrences (White, M. et al, 2016). School Nurses are well aware that they should never give a student a medication that is prescribed for another child. However, it occurs in up to 30% of the EAI use for CA, due to the current laws and the emergent need to respond to those with first time CA (Morris, P. et al, 2011).

Awareness of this issue is widespread across the mainland. President Obama highlighted this need with his signing of H.R. 2094, the School Access to Emergency Epinephrine Act, November 2013 (Jarrett, V., 2013). At present 49 states have laws allowing stock epinephrine availability in schools (Greenhawt, M. et al, 2018). Hawaii is the only state without a present law either opting or requiring schools to have protocols in place with stock epinephrine (Baulsir, B. and Inniss, B., 2015). Presently SB 2388 that amends Section 302A-1164, Hawaii Revised Statutes, was submitted for testimony Feb. 12, 2018. This Bill for an Act includes the ability for a health care provider to prescribe epinephrine auto injectors (EAI) to a school. It also provides for the supply of EAI to be accessed through third party suppliers at a reduced rate. The

Department of Education, during testimony, opposed the Bill on the basis of stock epinephrine. The Department of Health supported the Bill with some language change involving training within the proposed program. The Education committee assigned to the Bill has deferred the measure (Hawaii State Legislature, 2018).

I. Proposal Introduction:

The purpose of this article is to provide a framework of change to implement our issue statement. Our goal is to have lower childhood mortality and morbidity due to food related anaphylaxis, by having the availability of stock epinephrine and well-defined protocols for emergency response of anaphylaxis in Hawaii Schools. Change theorists study how to make successful and long lasting change. Kurt Lewin was one of the most often cited, with his three step process of unfreezing, changing and refreezing (Cummins, S. et al, 2016). However, John Kotter gives us a step-by-step process that fits well into the optimal organizational change needed for Hawaii to make EAIs accessible in schools (Kotter, J. 2007).

II. Methods for Legislative Change Phase:

Using John Kotter's steps for organizational change, change is possible through planning and communication. Then measures must be taken to assure the integrated change becomes established as the status quo (Kotter, J., 2007). Our population involved in the change process will include legislators, school leaders, school nurses, associations in our community, and national association representatives. We will work within the setting of urban Honolulu to make changes that will eventually become statewide.

A. Create a sense of urgency

Provide legislators introducing SB 2388 and those on the Educational Committee a letter of support for the Bill with evidenced based research. Personalize the urgency with statistics of children with allergies who have suffered from morbidity and mortality due to CA. Publish an article (newspaper, journal, or magazine) to describe the research behind the critical purpose of stock epinephrine in schools along with a process describing how a program could be instituted.

B. Build a core coalition

Personal contact with key persons who have an interest in this Bill should occur. Through the contact and information sharing, invite the key person or someone within their organization to join a coalition discussing SB 2388. This coalition should be made up of supporters as well as non-supporters. Department of Education is a prime example of a key stakeholder who should be offered a part of the coalition. By learning more of their concerns a mutually desirable plan may be developed.

Other important stakeholders are Department of Health (DOH), American Nurses Association (ANA), School Nurses in Hawaii, Hawaii Keiki,

National Association of Independent Schools (NAIS), Food Allergy Research & Education (FARE), and American Heart Association (AHA) (AED-CPR Division).

Form a Strategic Vision with the Core Coalition

Building the coalition through open negotiation and idea development will lead to a sense of ownership and passion for the strategic vision. The plan should be comprehensive, but outlined to communicate easily to legislative bodies. Center for Disease Control (CDC) and National Association of School Nurses (NASN) have developed emergency response plans for anaphylaxis in schools, using stock EAIs (CDC, 2013; NASN, 2014). Their templates can

easily provide a basis to build a plan that will work well within the Hawaii schools. The plan must include a process for evaluation of the ongoing program.

C. Communication of the Vision

Using the Coalition for help, get the word out to the community. The depth of the coalition will facilitate communication. Networking within the organizations will develop support and understanding of the vision.

D. Remove Barriers

Understand the barriers, with proposals ready to eliminate them. Economics will come into play. Provide information about the EpiPen4Schools program, which will help with the cost of some of the EAIs (Epipen4Schools, 2016). This program has a reporting system, which will help with evaluation and analysis of outcome. Liability may be a concern. Highlight the language that is inherent in the SB2388 to work towards protecting those prescribing the EAIs, those training school personnel in the use of EAIs and those administering EAIs. Review of state laws across the nation, will show many laws that have an "opt in" clause as opposed to a regulation clause. The "opt in" clause may provide less resistance, if schools are not forced into programs.

E. Sustaining Acceleration

Provide testimony in support of SB2388, with continued vigor to keep the purpose in front of legislature until the Bill is enacted into law.

III. Outcome Measurement for Legislative Change Phase:

The methods would be considered successful if a law allowing for stock epinephrine is accepted within two years. Once a law is passed, the protocol design for implementation should

be ready. The strategic planning by the Coalition group would have set up the design so it is ready for a pilot program.

IV. Methods for Implementation Phase:

A small set of public schools such as three elementary schools; one middle school and one high school would include a cross-sectional population for a pilot program. This set of schools could be with in my voting district. The approach to my senator and representative shows a community based initiative with their support.

The implementation phase would utilize the Kotter's change theory steps (Kotter, J., 2007).

A. Create a sense of urgency

Within the pilot schools, communicate the passage of the law and the opportunity to implement a program for a universal CA emergency response with stock epinephrine. Advocate for the program with case studies of CA and the need for quick response with EAIs to decrease childhood morbidity and mortality.

B. Build a core coalition

Gather stakeholders to come together for program implementation. Principals, Chief Financial Officer, School Nurse, Director of Communication, Director of Food Services, and Facility Supervisors would be important core personnel for planning. Ownership and passion towards successful implementation occurs more easily with joint planning and open discussion, as opposed imposed dictates from the top level.

C. Form a Strategic Protocol with the Core Coalition

With the passing of the legislation, a template suggestion towards a universal plan will form the framework for the program. NASN has gathered documents for such a framework and example forms are included in the appendix A, B, C, and D.

Included in the framework would be student action plans for children with known allergies. A communication process for these action plans. Ongoing training programs implemented for all school personnel concerning CA and response with EAIs. Options for purchase and refilling the pens should be decided upon with resources utilized such as Epi4Schools. EAI locations and storage wall mounts planned and placed. Methods for check lists of maintaining EAI stations. Communication protocols for emergency response should be clear and posted in all EAI locations. Universal reporting forms should be available to be completed for any episode. The reporting forms should be submitted to a central location such as DOH.

D. **Communicate the strategic protocol**

The protocol should be communicated school wide. The initial method of communication is best during face-to-face meetings. However, using every communication vehicle available will assure for better implementation success.

E. Removing the barriers

Anticipating any barriers and responding with well thought out solutions will lend towards better success. Barriers will arise with any newly implemented program. Having open discussions with the coalition for a more comprehensive perspective of the barriers, will allow for a better understanding prior to implementation. This understanding gives a basis for cooperative discussions and supported solutions by the key stakeholders.

F. Sustaining Acceleration

The reporting system is critical to the overall success of the protocol. The data from the reporting system can be used to show the concrete benefit of the implemented program. The report should be communicated annually to sustain the energy and success of the program.

V. Analysis of the Outcome of the Pilot Program

Analysis of the data will be in the retrospective chart review format. A method of analysis should be set up prior to the pilot program start up attending to possible pit falls in analysis (Matt and Matthew, 2013). Important aspects for data analysis will be the representation of the population. Since this study is a pilot and includes only a small set of schools, there is an inherent bias. Understanding that issue will be present, increase the strength of analysis by using power analysis for the appropriate number of sample. Randomize the data for analysis or stratify it, depending on the sample size. Set up the reliability of the data extraction with a set process and as few data personnel as possible. Reliability will be better with a consistent pattern of data collection and a unified small group of data extractors. Clarify prior to data collection, what data may be excluded or included. Are there charting inconsistencies with reporting that will make some data unusable? With a well thought out analysis of the data prior to the start of the pilot program, there will be less potential for pitfalls for poor outcome data (Matt and Matthew, 2013).

VI. Outcome of Implementation of Pilot Phase

Universal response protocol with stock EAIs is the ultimate goal for Hawaii. With successful implementation of a pilot program, further implementation on a statewide level can be possible by using the pilot framework. EpiPen4Schools reported data from the 2014-15 academic year including 12,275 mainland schools utilizing stock epinephrine. Within those statistics, 49% of the EAIs used for CA response were stock epinephrine (Greenhawt, M. et al, 2018). Having

stock EAIs with a response plan in place should decrease morbidity and mortality of CA. However, it will be critical to maintain and analyze the data to prove the program's success.

VII. Discussion

Childhood anaphylaxis is becoming more widespread each year (Feuille, E. et al, 2017). Schools should be a safe place for our children. Hawaii is attempting to gain this legislature, however there is still resistance. Using the organizational steps towards successful change may facilitate the legislature being passed and a pilot program being instituted.

VIII. Lessons Learned

Economics will come into play when the program is expanded statewide with the Department of Education. Likely this is the biggest barrier for the passage of the Act at this time. Private schools will be able to fund the stock EAIs with the help of EpiPens4School. Additional funds will be needed to maintain the program and the private schools can provide them. The size of the DOE, with the large number of schools, will call for a greater number of stock EAIs and thus a greater expense. DOE is hampered by the lack of RNs available to the schools. A pilot program with fewer schools will include likely have more school nurses. However, the entire DOE school system employs few RNs.

Conclusions

The purpose of this article is to provide a framework of change to implement our issue statement. Our goal is to have less childhood mortality and morbidity due to food-related anaphylaxis, by having the availability of stock epinephrine and well-defined protocols for emergency response of anaphylaxis in Hawaii Schools. Using Kotter's plan for change, we set up a process for accomplishing both the change with legislation and the implementation of a pilot program.

Childhood Anaphylaxis is a serious issue among our children in Hawaii Schools. Our community must collaborate to find a way to keep our keiki safe. Hawaii is the only state without a law allowing for stock epinephrine. Epinephrine is the drug of choice for emergency response of CA (Boyce. J., et al, 2011). Research has demonstrated that at least 20% of all CA that occurs in schools are first time occurrences (White, M. et al, 2016). Those who receive epinephrine rapidly before getting to the hospital have less morbidity and mortality (Fleming, 2015). The EAIs must be available and universal programs in place to respond efficiently and promptly in emergency CA. Hawaii is able to make this happen in the schools. Change is difficult, but this change is critical for our community.

Appendix A

Sample Anaphylaxis Policy

School Name: _____

Background:

- *(Allergy and Anaphylaxis Overview)*
  The incidence of severe allergic reactions has been rising at an alarming rate, especially with regard to food. Other common causes of anaphylaxis include allergies to latex, medications, and insect stings.

Pathophysiology and treatment:

Anaphylaxis can affect almost any part of the body and cause various symptoms. The most dangerous symptoms include breathing difficulties and a drop in blood pressure or shock, which are potentially fatal.

Medications

- Epinephrine
- Anithistamines

Treatment of anaphylaxis is centered on treating the rapidly progressing effects of the histamine release in the body with epinephrine. The allergen should also be removed immediately.

Creating an Allergen-Safe School Environment
(Importance of Prevention)

- Protecting a student from exposure to offending allergens is the most important way to prevent life-threatening anaphylaxis.
- Avoidance of exposure to allergens is the key to preventing a reaction.
- The risk of exposure to allergens for a student is reduced when the school personnel, medical provider and parent/guardian work together to develop a management plan for the student.
- Educating the entire school community about life-threatening allergies is important in keeping students with life-threatening allergies safe.

Identifying the School Team *(identify the team members and clearly define their roles and responsibilities)*

- School District administration
- School Nurse
- School Medical Director
- Teachers
- Food Service Personnel
- Coaches, Athletic Directors, and After School Volunteers
- Transportation Personnel

Action Steps for Anaphylaxis Management
(Review the Anaphylaxis Algorithm and make adjustments as needed.)

- Providing necessary precautions and general training for staff in transportation, classrooms, the cafeteria, or the gymnasium;
- Training by licensed medical personnel/ registered professional nurses for all adults in a supervisory role in the recognition and emergency management of a specific medical condition for specific students;
- Creating Individual Health Care Plans (IHP), Emergency Care Plans (ECP), 504 Plans, or Individualized Educational Plans (IEP) as indicated;
- Having standing emergency medical protocols for nursing staff;
- Maintaining stock supplies of life saving emergency medications, as allowed by the laws of NYS, such as EpiPens, in all health offices for use in first time emergencies;
- Following specific legal documents duly executed in accordance with the laws of NYS with medical orders regarding the care of specific students with severe life-threatening conditions;
- Allowing self-directed students as assessed by the school nurse to carry life saving medication with prior approval by the medical provider, and according to health practice and procedures, as long as duplicate life saving medication is also maintained in the health office in the event the self-carrying student misplaces their medicines; and

- Assuring appropriate and reasonable building accommodations are in place within a reasonable degree of medical certainty

Resources
(If deemed appropriate information from:)

- Health History
- Care Plan (IHP or ECP)
- Online training course
- Available at www.schoolhealthservicesny.com

Appendix B

American Academy of Allergy Asthma & Immunology
www.aaaai.org

Anaphylaxis Emergency Action Plan

Patient Name: _____ **Age:** _____

Allergies: _____

Asthma ☐ **Yes** ***(high risk for severe reaction)*** ☐ **No**

Additional health problems besides anaphylaxis: _____

_____

Concurrent medications: _____

_____

Symptoms of Anaphylaxis

MOUTH	**itching, swelling of lips and/or tongue**
THROAT*	**itching, tightness/closure, hoarseness**
SKIN	**itching, hives, redness, swelling**
GUT	**vomiting, diarrhea, cramps**
LUNG*	**shortness of breath, cough, wheeze**
HEART*	**weak pulse, dizziness, passing out**

Only a few symptoms may be present. Severity of symptoms can change quickly.
****Some symptoms can be life-threatening. ACT FAST!***

Emergency Action Steps - DO NOT HESITATE TO GIVE EPINEPHRINE!

1. Inject epinephrine in thigh using (check one):

☐ **Adrenaclick (0.15 mg)** ☐ **Adrenaclick (0.3 mg)**

☐ **Auvi-Q (0.15 mg)** ☐ **Auvi-Q (0.3 mg)**

☐ **EpiPen Jr (0.15 mg)** ☐ **EpiPen (0.3 mg)**

Epinephrine Injection, USP Auto-injector- authorized generic
☐ **(0.15 mg)** ☐ **(0.3 mg)**

☐ **Other (0.15 mg)** ☐ **Other (0.3 mg)**

Specify others: _____

IMPORTANT: ASTHMA INHALERS AND/OR ANTIHISTAMINES CAN'T BE DEPENDED ON IN ANAPHYLAXIS.

2. Call 911 or rescue squad (before calling contact)

3. Emergency contact #1: home_____ **work**_____ **cell**_____

Emergency contact #2: home_____ **work**_____ **cell**_____

Emergency contact #3: home_____ **work**_____ **cell**_____

Comments: _____

_____

_____
Doctor's Signature/Date/Phone Number

_____
Parent's Signature (for individuals under age 18 yrs)/Date

Appendix C

MANAGEMENT OF FOOD ALLERGIES: SCHOOL TREATMENT

Suggested Emergency **Nursing Protocol** for Students with Possible Food Allergy Symptoms Who Don't Have a Personal Emergency Care Plan

A student with food allergy symptoms should be placed in an area where he/she can be closely observed. Never send a student to the health room alone or leave a student alone. Limit moving a student who is in severe distress. Go to the student instead.

Immediate Assessment:

Are the signs or symptoms severe? (for suspected or known ingestion) Any one of:

LUNG: Short of breath, wheeze, repetitive cough
HEART: Pale, blue, faint, weak pulse, dizzy, confused
THROAT: Tight, hoarse, trouble breathing/swallowing
MOUTH: Obstructive swelling (tongue and/or lips)
SKIN: Many hives over body

Or combination of symptoms from different body areas:
SKIN: Hives, itchy rashes, swelling (e.g., eyes, lips)
GUT: Vomiting, crampy pain

Yes

Take Immediate Actions

1. INJECT EPINEPHRINE IMMEDIATELY
2. Call 911
3. Begin monitoring (see box below)
4. Give additional medications:*
   - Inhaler (bronchodilator) if asthma
   - *Inhalers/bronchodilators are not to be depended upon to treat a severe reaction (anaphylaxis).

USE EPINEPHRINE.

No

MILD SYMPTOMS ONLY:

MOUTH: Itchy mouth
SKIN: A few hives around mouth/face, mild itch
GUT: Mild nausea/discomfort

Yes

Monitor as below.

Observe for severe signs or symptoms-if any develop, take immediate action.

Contact parent/guardian.

Monitoring

Stay with student. Check and record respirations, pulse and BP. Alert healthcare professionals and parent. Tell EMS (Emergency Medical Services) that epinephrine was given; request an ambulance with epinephrine. Note time when epinephrine was administered. A second dose of epinephrine can be given 5 minutes or more after the first if symptoms persist or recur. For a severe reaction, consider keeping student lying on back with legs raised. Treat student even if parents cannot be reached. Continue to observe student after symptoms have subsided, as a biphasic reaction can occur hours after the original exposure/reaction.

With parental permission, send a copy of the health room encounter report to the student's physician. Obtain a personal food allergy action / Emergency Care plan.

March 2011

Appendix D

Report of Epinephrine Administration

Student Demographics and Health History

1. School District: _____ Name of School: _____

2. Age:_____ Type of Person: Student ☐ Staff ☐ Visitor ☐ Gender: M ☐ F ☐ Ethnicity: Spanish/Hispanic/Latino: Yes ☐ No ☐

3. Race: American Indian/Alaskan Native ☐ African American ☐ Asian ☐ Native Hawaiian/other Pacific Islander ☐ White ☐ Other ☐

4. History of severe or life-threatening allergy: Yes, Known by student/family ☐ Yes, Known by school ☐ Unknown ☐
If known, specify type of allergy: _____

If yes, was allergy action plan available at school? Yes ☐ No ☐ Unknown ☐
History of anaphylaxis: Yes, Known by student/family ☐ Yes, Known by school ☐ Unknown ☐
Previous epinephrine use: Yes, by student/family ☐ Yes, at school ☐ No ☐ Unknown ☐
Diagnosis/History of asthma: Yes, Known by student/family ☐ Yes, known by school No ☐ Unknown ☐

School Plans and Medical Orders

5. Individual Health Care Plan (IHCP) in place? Yes ☐ No ☐ Unknown ☐

6. Written school district policy on management of life-threatening allergies in place? Yes ☐ No ☐ Unknown ☐

7. Does the student have a student specific order for epinephrine? Yes ☐ No ☐ Unknown ☐

8. Expiration date of epinephrine _____ Unknown ☐

Epinephrine Administration Incident Reporting

9. Date/Time of occurrence: _____Vital signs: BP_____/____ Temp _____ Pulse _____ Respiration _____

10. If known, specify trigger that precipitated this allergic episode:

Food ☐ Insect Sting ☐ Exercise ☐ Medication ☐ Latex ☐ Other ☐ _____ Unknown ☐

If food was a trigger, please specify which food
_____
Please check: Ingested ☐ Touched ☐ Inhaled ☐ Other ☐ specify
_____

11. Did reaction begin prior to school? Yes ☐ No ☐ Unknown ☐

12. Location where symptoms developed:
Classroom ☐ Cafeteria ☐ Health Office ☐ Playground ☐ Bus ☐ Other ☐ specify
_____

13. How did exposure occur?

_____
_____

_____
_____

14. Symptoms: (Check all that apply)

Respiratory	**GI**	**Skin**	**Cardiac/Vascular**	**Other**
☐ Cough	☐ Abdominal discomfort	☐ Angioedema	☐ Chest discomfort	☐ Diaphoresis
☐ Difficulty breathing	☐ Diarrhea	☐ Flushing	☐ Cyanosis	☐ Irritability
☐ Hoarse voice	☐ Difficulty swallowing	☐ General pruritis	☐ Dizziness	☐ Loss of consciousness
☐ Nasal congestion/rhinorrhea	☐ Oral Pruritis	☐ General rash	☐ Faint/Weak pulse	☐ Metallic taste
☐ Swollen (throat, tongue)	☐ Nausea	☐ Hives	☐ Headache	☐ Red eyes
☐ Shortness of Breath	☐ Vomiting	☐ Lip swelling	☐ Hypotension	☐ Sneezing
☐ Stridor		☐ Localized rash	☐ Tachycardia	☐ Uterine cramping
☐ Tightness (chest, throat)		☐ Pale		
☐ Wheezing				

15. Location where epinephrine administered: Health Office ☐ Other ☐ specify
_____

16. Location of epinephrine storage: Health Office ☐ Other ☐ specify
_____

17. Epinephrine administered by: RN ☐ Self ☐ Other ☐

If epinephrine was self-administered by a student at school or a school-sponsored function, was the student formally trained?

Yes ☐ If known, date of training _____ No ☐

Did the student follow school protocols to notify school personnel and activate EMS? Yes ☐ No ☐ NA ☐

If epinephrine was administered by other, please specify_____

Was this person formally trained? Yes ☐ Date of training _____ No ☐ Don't know ☐

18. Time elapsed between onset of symptoms and communication of symptoms:
_____minutes

19. Time elapsed between communication of symptoms and administration of epinephrine: _____
_____minutes

Parent notified of epinephrine administration: (time) _____

20. Was a second dose of epinephrine required? Yes ☐ No ☐ Unknown ☐

If yes, was that dose administered at the school prior to arrival of EMS? Yes ☐ No ☐ Unknown ☐

Approximate time between the first and second dose _____

Biphasic reaction: Yes ☐ No ☐ Unknown ☐

Disposition

21. EMS notified at: (time) _____
Transferred to ER: Yes ☐ No ☐ Unknown ☐
If yes, transferred via ambulance ☐ Parent/Guardian ☐ Other ☐ Discharged after _____ hours
Parent: At school ☐ Will come to school ☐ Will meet student at hospital ☐ Other: _____
_____

22. Hospitalized: Yes ☐ If yes, discharged after _____ days No ☐ Name of hospital: _____
_____

23. Student/Staff/Visitor outcome:
_____

If first occurrence of allergic reaction:

a. Was the individual prescribed an epinephrine autoinjector in the ER? Yes ☐ No ☐ Don't know ☐

b. If yes, who provided the epinephrine autoinjector training?
ER ☐ PCP ☐ School Nurse ☐ Other ☐ _____ Don't know ☐

c. Did the ER refer the individual to PCP and/or allergist for follow-up? Yes ☐ No ☐ Don't know ☐

School Follow-up

24. Did a debriefing meeting occur? Yes☐ No ☐ Did family notify prescribing MD? Yes ☐ No ☐ Unknown ☐

25. Recommendation for changes: Protocol change ☐ Policy change ☐ Educational change ☐ Information sharing ☐ None ☐

26. Comments (include names of school staff, parent, others who attend debriefing):
_____

_____
_____

_____
_____

27. Form completed by:_____
Date:_____
(please print)

Title:_____

Phone number: (_____) _____ - _____ Ext.: _____ Email :
_____

School District:
_____

School address: -
_____

References

Baulsir B, Inniss B. Summary Matrix of State Laws Addressing Epi-Pen Use in Schools. St Paul, MN: The Network for Public Health Law; 2015.

Bartnikas, L. M., Huffaker, M. F., Sheehan, W. J., Kanchongkittiphon, W., Petty, C. R., Leibowitz, R., ... & Phipatanakul, W. (2017). Impact of school peanut-free policies on epinephrine administration. *Journal of Allergy and Clinical Immunology*, *140*(2), 465-473.

Boyce, J. A., Assa'ad, A., Burks, A. W., Jones, S. M., Sampson, H. A., Wood, R. A., ... & Bahna, S. L. (2011). Guidelines for the diagnosis and management of food allergy in the United States: summary of the NIAID-sponsored expert panel report. *Journal of the American Academy of Dermatology*, *64*(1), 175-192.

Cannuscio, C. C., Dupuis, R., Graves, A., Seymour, J. W., Kounaves, S., Strupp, E., ... & Meisel, Z. F. (2015). A behavioral economics intervention to encourage epinephrine-carrying among food-allergic adults: a randomized controlled trial. *Annals of Allergy, Asthma & Immunology*, *115*(3), 234-240.

Centers for Disease Control and Prevention. *Voluntary Guidelines for Managing Food Allergies in Schools and Early Care and Education Programs*. Washington, DC: US Department of Health and Human Services; 2013.

Cummings, S., Bridgman, T., & Brown, K. G. (2016). Unfreezing change as three steps: Rethinking Kurt Lewin's legacy for change management. *human relations*, *69*(1), 33-60.

Dinakar, C. (2012). Anaphylaxis in children: current understanding and key issues in diagnosis and treatment. *Current allergy and asthma reports, 12*(6), 641-649.

Dudley, L. S., Mansour, M. I., & Merlin, M. A. (2015). Epinephrine for Anaphylaxis: Underutilized and Unavailable. *Western Journal of Emergency Medicine*, *16*(3), 385–387. http://doi.org.hpu.idm.oclc.org/10.5811/westjem.2015.3.25337.

Epipen4Schools (2018). Retrieved 6-15-2018 from https://www.epipen4schools.com.

Feuille, E., Lawrence, C., Volel, C., Sicherer, S. H., & Wang, J. (2017). Time Trends in Food Allergy Diagnoses, Epinephrine Orders, and Epinephrine Administrations in New York City Schools. *The Journal of pediatrics*, *190*, 93-99.

Food Allergy Research & Education (FARE), Facts and Statistics. Retrieved on 6-4-2018 from https://www.foodallergy.org/facts-and-stats.

Friedlander, J. L., Sheehan, W. J., Baxi, S. N., Kopel, L. S., Gaffin, J. M., Ozonoff, A., ... & Phipatanakul, W. (2013). Food allergy and increased asthma morbidity in a School-based Inner-City Asthma Study. *The Journal of Allergy and Clinical Immunology: In Practice*, *1*(5), 479-484.

Gaspar, A., Santos, N., Piedade, S., Santa-Marta, C., Pires, G., Sampaio, G., ... & Morais-Almeida, M. (2015). One-year survey of paediatric anaphylaxis in an allergy department. *European annals of allergy and clinical immunology*, *47*(6), 197-205.

Greenhawt, M., Wallace, D., Sublet, W., Maughan, E., Tanner, A., Kelly, K., ... & Schoessler, S. (2018). Current trends in food allergy-induced anaphylaxis management at school. *Annals of Allergy, Asthma & Immunology*.

Gupta, R. S., Springston, E. E., Warrier, M. R., Smith, B., Kumar, R., Pongracic, J., & Holl, J. L. (2011). The prevalence, severity, and distribution of childhood food allergy in the United States. *Pediatrics, 128*(1), e9-17. doi:10.1542/peds.2011-0204

Hawaii State Legislature. 2018. SB 2388. Retrieved from https://www.capitol.hawaii.gov/measure_indiv.aspx?billtype=SB&billnumber=2388&year=2018

Hogue, S. L., Goss, D., Kelly Hollis, S. S., & White, M. V. (2016). Training and administration of epinephrine auto-injectors for anaphylaxis treatment in US schools: results from the EpiPen4Schools® pilot survey. *Journal of asthma and allergy*, *9*, 109.

Jarrett, V. (2013, November 13). President Obama Signs New EpiPen Law To Protect Children with Asthma and Severe Allergies, And Help Their Families To Breathe Easier. [Blog post]. Retrieved from https://obamawhitehouse.archives.gov/blog/2013/11/13/president-obama-signs-new-epipen-law-protect-children-astma-and-severe-allergies.

Kotter, J. (2007). Leading change: Why transformation efforts fail. *Harvard business review*, *86*, 97-103.

Matt, V., & Matthew, H. (2013). The retrospective chart review: important methodological considerations. *Journal of educational evaluation for health professions*, *10*.

Morris, P., Baker, D., Belot, C., & Edwards, A. (2011). Preparedness for students and staff with anaphylaxis. *Journal of School Health*, *81*(8), 471-476.

Motosue, M. S., Bellolio, M. F., Van Houten, H. K., Shah, N. D., & Campbell, R. L. (2017). Increasing emergency department visits for anaphylaxis, 2005-2014. *The Journal of Allergy and Clinical Immunology: In Practice*, *5*(1), 171-175.

Murakami, Y., Iwami, T., Kitamura, T., Nishiyama, C., Nishiuchi, T., Hayashi, Y., & Kawamura, T. (2014). Outcomes of out-of-hospital cardiac arrest by public location in the public-access defibrillation era. *Journal of the American Heart Association*, *3*(2), e000533.

National Association of School Nurses. 2014. Food Allergies and Anaphylaxis. Retrieved from https://www.nasn.org/nasn-resources/practice-topics/food-allergies

Robinson, M., Greenhawt, M., & Stukus, D. R. (2017). Factors associated with epinephrine administration for anaphylaxis in children before arrival to the emergency department. *Annals of Allergy, Asthma & Immunology*, *119*(2), 164-169.

Sicherer, S. H., & Simons, F. E. R. (2017). Epinephrine for first-aid management of anaphylaxis. *Pediatrics*, *139*(3), e20164006.

State of Hawaii. (2012). Hawaii Health Survey. Retrieved from http://health.hawaii.gov/hhs/hawaii-health-survey-2012/

White, M. V., Hogue, S. L., Odom, D., Cooney, D., Bartsch, J., Goss, D., … Silvia, S. (2016). Anaphylaxis in Schools: Results of the EPIPEN4SCHOOLS Survey Combined Analysis. *Pediatric Allergy, Immunology, and Pulmonology*, *29*(3), 149–154. http://doi.org.hpu.idm.oclc.org/10.1089/ped.2016.0675