

Clinical Communications

Stock epinephrine in schools: A survey of implementation, use, and barriers

Sarah A. Denny, MD, Amanda Merryweather, BS,
Jennifer M. Kline, MPH, CCRP, and
Rachel Stanley, MD, MHSA

Clinical Implications

- Implementation of stock epinephrine in schools may be lifesaving. Identifying barriers to implementation can inform health care providers, departments of education, and school boards of ways to support implementation of stock epinephrine in schools.

TO THE EDITOR:

The prevalence of food allergies is on the rise in the United States. A 2017 study showed that the incidence of anaphylaxis increased by 42 per 100,000 person-years over the 10-year study.¹

A 2006 study estimated that 88% of schools in the United States had 1 or more students with food allergies.² Stock epinephrine programs have been implemented to treat individuals with anaphylaxis who do not have a prescribed epinephrine autoinjector present at the time of the reaction.

All 50 states and the District of Columbia have laws that either allow or require schools to stock epinephrine.³ Ohio's law allows school districts to voluntarily stock and administer epinephrine in the event of anaphylaxis.⁴ This "stock epinephrine" can be used on any adult or child with anaphylaxis, even if they have not been individually prescribed epinephrine.

We surveyed school nurses in Ohio to identify the number of schools with an implemented stock epinephrine program, determine if stock epinephrine has been used in those schools, and identify barriers to implementing stock epinephrine programs. The 51-question anonymous REDCap survey was sent to members of the Ohio Association of School Nurses (OASN).

Of the 539 OASN members, 249 (46.2%) completed the survey. Of the respondents, 98.4% had heard of the legislation permitting stock epinephrine in schools and 57.4% stock epinephrine in their school.

SCHOOLS NOT STOCKING EPINEPHRINE

Less than half 42.6% (106 of 249) of respondents do not have stock epinephrine in their schools. Of those, many (52.8%, 56 of 106) are interested in implementing a program in their school, and almost all (90.6%, 96 of 106) responded that having stock epinephrine available is important.

Barrier(s) to implementation include cost (54.7%) and administration deciding not to participate (50.0%) (Figure 1). The leading resources identified were help obtaining epinephrine and finding a prescriber to sign the school district prescription (Figure 2).

Nurses from schools that do not have stock epinephrine and were also not interested in stocking epinephrine (n = 50) said

they are not interested because of cost (62.0%, 31 of 50), "it is too difficult to implement" (36.0%, 18 of 50), and "it is not necessary" (4%, 2 of 50); 42.0% (21 of 50) cited lack of prescriber and administrative hesitancy as the main reasons for lack of implementation.

STOCK EPINEPHRINE PROGRAM

More than half (57%, 143 of 249) of survey respondents have stock epinephrine available, obtained from the manufacturer through an online program (76.2%, 109 of 143), paid for by school district (14.7%, 21 of 143), donation (4.9%, 7 of 143), other (2.1%, 3 of 143), or the source was unknown by the respondent (6.3%, 9 of 143). Of respondents with a stock epinephrine program, 18.2% (26 of 143) report that stock epinephrine had been used to treat anaphylaxis. Those who received epinephrine were students (86.5%, 32 of 37), teachers (8.1%, 3 of 37), adult visitor (2.7%, 1 of 37), and other (2.7%, 1 of 37). Nurses most frequently (83.8%, 31 of 37) administered stock epinephrine, but administrative assistants (8.1%, 3 of 37), principals (5.4%, 2 of 37), and nurse's aides (2.7%, 1 of 37) gave epinephrine, when needed. Respondents reported that 46% of the time epinephrine was used, the allergen was unknown. Although one would hope that children with known food allergies would have a prescribed epinephrine autoinjector at school, those children with unknown allergies would not have this life-saving treatment present in a school without a stock epinephrine program.

This survey of school nurses indicates that most respondents have heard about stock epinephrine legislation, but only a slight majority actually have a program in place. The data indicate that schools with stock epinephrine can and do use it in the setting of anaphylaxis. Those schools without stock epinephrine programs indicate an interest in implementing a program but do not know where to find resources for implementation.

Survey data indicate that cost is the biggest perceived barrier to stock epinephrine implementation among survey respondents. The high cost of epinephrine autoinjectors has received national attention in the past few years and is reported as the biggest reason for not wanting to implement a stock epinephrine program in this survey. School nurses or decision makers for school districts may not know that multiple pharmaceutical companies offer free epinephrine autoinjector programs for schools. Education on these programs could be provided through school nurse associations, school board associations, and departments of health.

Lack of a prescribing provider was another barrier to stock epinephrine implementation. Health care providers may feel hesitant about the time required or potential liability associated with prescribing epinephrine; however, Ohio law clearly absolves any liability to the school or school district, the district board of education, district or school employee, or prescribing health care professional, assuming no willful or wanton misconduct.⁵ Health care providers should carefully review the verbiage of their state law and address any concerns to legal counsel for further review.

This study has limitations, including a selection bias, with the survey only distributed to active members of the OASN. Not all

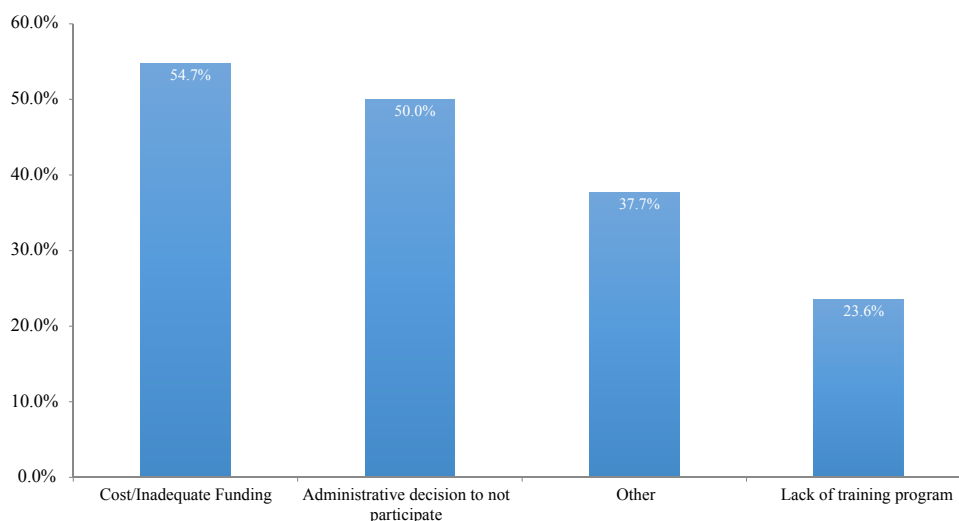


FIGURE 1. Perceived barriers to implementation in schools without a stock epinephrine program.

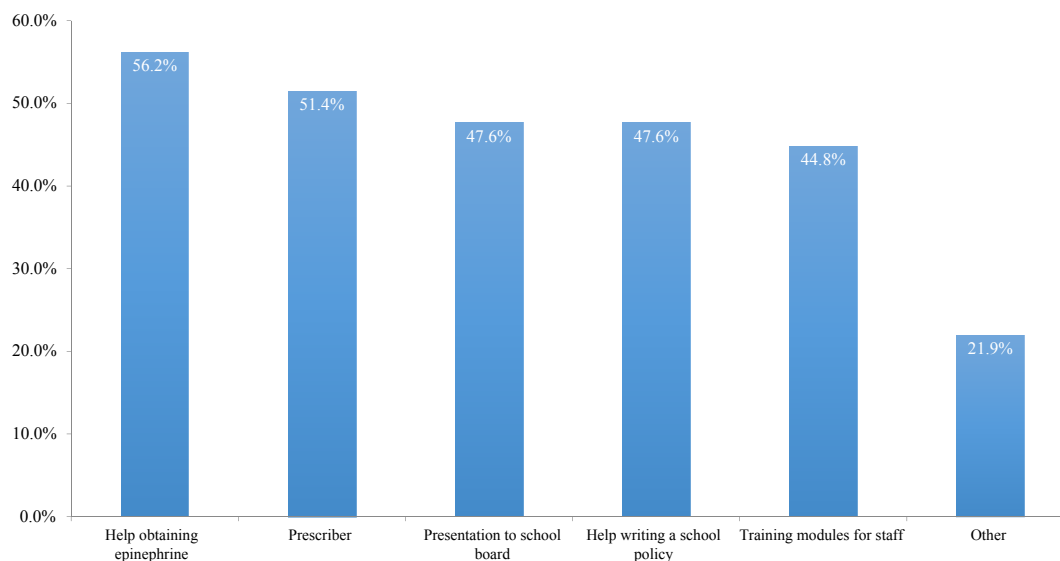


FIGURE 2. Suggested resources that would help schools not currently stocking epinephrine to implement such a program.

Ohio school nurses are members of OASN. However, the authors felt that using the OASN membership list would give us a broad, representative sample (55 of 88 counties, from all parts of the state, were represented). With any self-reported survey, there may be a response bias. Because this was a voluntary survey, respondents may have stronger feelings for or against stock epinephrine programs.

Although school nurses are aware of the stock epinephrine legislation, and some have implemented the program, there are still perceived barriers to implementation of school stock epinephrine programs in schools. This study shows that stock epinephrine programs can be implemented and used in the school setting for anaphylaxis.

Next steps to increase implementation of stock epinephrine in schools include an education campaign through school nurse and school board associations to highlight the importance of stock

epinephrine programs and currently available resources. In addition, the development of a toolkit could help with implementation of stock epinephrine programs.

Division of Emergency Medicine, Nationwide Children's Hospital, Columbus, Ohio
Incentive gift cards and statistical support were provided by the Division of Emergency Medicine, Nationwide Children's Hospital.

Conflicts of interest: The authors declare that they have no relevant conflicts of interest.

Received for publication April 9, 2019; revised August 28, 2019; accepted for publication September 4, 2019.

Available online ■■

Corresponding author: Sarah A. Denny, MD, Division of Emergency Medicine, Nationwide Children's Hospital, 700 Children's Drive, Columbus, OH 43205.
E-mail: Sarah.denny@nationwidechildrens.org.

2213-2198

© 2019 American Academy of Allergy, Asthma & Immunology

<https://doi.org/10.1016/j.jaip.2019.09.005>

REFERENCES

1. Lee S, Hess EP, Lohse C, Gilani W, Chamberlain AM, Campbell RL. Trends, characteristics, and incidence of anaphylaxis in 2001-2010: a population-based study. *J Allergy Clin Immunol* 2017;139:182-188.e2.
2. O'Toole TP, Anderson S, Miller C, Guthrie J. Nutrition services and foods and beverages available at school: results from the School Health Policies and Programs Study 2006. *J School Health* 2007;77:500-21.
3. Food Allergy Research & Education. School Access to Epinephrine Map; 2016. Available from: <https://www.foodallergy.org/education-awareness/advocacy-resources/advocacy-priorities/school-access-to-epinephrine-map>. Accessed August 1, 2018.
4. The Ohio General Assembly. House Bill 296; 2017. Available from: <https://www.legislature.ohio.gov/legislation/legislation-status?id=GA132-HB-296>. Accessed July 20, 2018.
5. Ohio Revised Code. Procurement of Epinephrine Autoinjectors for Public Schools; 2016. Available from: <http://codes.ohio.gov/orc/3313.7110>. Accessed July 20, 2018.