



Correspondence

Recently published anaphylaxis practice parameter

During our journal club today, we read with appreciation and enthusiasm the anaphylaxis practice parameter published in the November issue of the *Annals*.¹ We noted 3 typographical errors.

On page 344 (second column, fourth paragraph, last sentence), we believe the reference number 3 for the “publication sponsored by the World Allergy Organization” is incorrect and should be Simons et al.² On page 347 (under issue 8), the epinephrine dose of 0.3 mg for children weighing 15 to 30 kg is an error. It should be 0.15 mg. On page 361 (first column, last paragraph), the dose unit of glucagon was twice mentioned incorrectly in milligrams. This dose should be in micrograms for children per kilogram of body weight and in the infusion dose.

Disclosures: Authors have nothing to disclose.



Hetu Parekh, MD

Adesh Patel, MD

Neetu Godhwani, MD

Allergy/Immunology Section

Louisiana State University Health Sciences Center

Shreveport, Louisiana

hparek@lsuhsc.edu

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Authors' response

Thank you very much for pointing out the errors in the parameter.^{1,2} We greatly appreciate your help.

Phillip Lieberman, MD
Department of Allergy/Immunology
University of Tennessee
Memphis, Tennessee
aac@allergymemphis.com



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Refractory anaphylaxis: further considerations for emergency care providers



We read with great interest the 2015 update of the anaphylaxis practice parameter by Lieberman and colleagues.¹ Several aspects of this update are particularly relevant to clinicians in emergency medicine, especially the sections on “Office Management of Anaphylaxis” and “Controversies and Unsettled Issues Related to Patients at Risk for or Being Treated for Anaphylaxis.” However, we believe that there are also several issues included in the update that require clarification based on the current literature.

Vasopressors in Anaphylactic Shock

The pathophysiology of anaphylactic shock is complex, with multiple physiologic effects, including (1) hypovolemia secondary to vascular extravasation; (2) early arteriolar dilation

manifested as a widened pulse pressure; (3) venodilation and blood pooling, contributing to reduced venous return; (4) relative bradycardia; (5) impaired myocardial contractility; and (6) transient increase in pulmonary vascular resistance.² The authors state that “current recommendations are to start with an infusion of epinephrine for unresponsive anaphylaxis; and if there is refractory hypotension, then add dopamine as a second vasopressor.”¹ The literature supports the use of epinephrine infusion in refractory anaphylactic shock because it reverses most of the cardiovascular effects of anaphylaxis.³ At low doses, dopamine exerts its effects on the β -adrenergic receptors, causing an increase in myocardial function, heart rate, and some vasodilation. However, there is no clear evidence for the use of dopamine as a second-line vasopressor in anaphylactic shock. This is particularly important given that dopamine has been associated with a higher risk of mortality and major adverse events

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compared with epinephrine and norepinephrine.^{4,5} The literature suggests that norepinephrine or vasopressin may be appropriate second-line agents. Norepinephrine acts primarily on the α -adrenergic receptors, whereas vasopressin acts on the V1 receptors, both leading to vasoconstriction.^{2,6} Methylene blue has also been used with good success in catecholamine-refractory vasoplegic anaphylactic shock.⁷

Upper Airway Obstruction

Upper airway angioedema leading to asphyxia accounts for approximately 25% of fatal anaphylaxis cases.⁸ This complication is of particular concern in young children given their anatomy and higher susceptibility to significant obstruction with even a mild degree of airway edema. Because of its rapid effectiveness, ease of administration, and reasonable safety profile, inhaled nebulized epinephrine should be considered in children with anaphylaxis who present with stridor or other signs of upper airway obstruction.^{9,10} Health care professionals should consider this intervention before proceeding to advanced airway measures, especially in prehospital settings. It should be noted that inhaled nebulized epinephrine acts primarily in the upper airway with minimal systemic effects. Therefore, it is not an alternative but rather adjunctive treatment of anaphylaxis with injectable intramuscular epinephrine.⁹

Glucagon Dosing Error

Finally, we would like to suggest a correction in the published glucagon dose. In children, the loading dose is 20 to 30 $\mu\text{g}/\text{kg}$ (maximum, 1 mg), and the infusion dose is 5 to 15 $\mu\text{g}/\text{min}$ rather than the dose recommended in the 2015 update.

Authors' response

Thank you so much for your interest in our parameters¹ and your very helpful letter.² We greatly appreciate your comments. As far as the dose of glucagon is concerned, we have added an erratum to the *Annals*.³

Phillip Lieberman, MD
Department of Allergy/Immunology
University of Tennessee
Germantown, Tennessee
aac@allergymemphis.com

Waleed Alqurashi, MD, MSc*

Fuad Alnaji, MD†

Kusum Menon, MD, MSc†

*Department of Pediatrics and Emergency Medicine
University of Ottawa

†Divisions of Pediatric Critical Care
Children's Hospital of Eastern Ontario
Ottawa, Ontario, Canada
walqurashi@cheo.on.ca

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