

From The Medical Letter on Drugs and Therapeutics

Anaphylaxis and Insect Stings and Bites

Anaphylaxis

Anaphylaxis, a multi-system allergic reaction that is rapid in onset and may cause death, often occurs in community settings where it is typically triggered by a food, insect sting, or medication. The incidence of anaphylaxis is increasing in the US population. The greatest increase has been reported in food-related anaphylaxis, which occurs most commonly in the pediatric population.¹ Vaccine-triggered anaphylaxis remains rare.² Patients at risk for anaphylaxis in community settings should receive printed information about how to avoid their relevant triggers.³ Those who have had an anaphylactic reaction triggered by stinging insects should be instructed in insect avoidance measures and referred to an allergy/immunology specialist for immunotherapy with standardized extracts of insect venom or whole-body extract from fire ants.⁴

Epinephrine

All patients at risk for anaphylaxis recurrence in community settings and caregivers of children at risk should be equipped with one or more epinephrine auto-injectors such as EpiPen or Auvi-Q (or generic epinephrine for injection) and trained to recognize anaphylaxis and use the auto-injector correctly and safely (Table). There are no absolute contraindications to epinephrine injection in anaphylaxis. Concerns about potential adverse effects in the elderly and in patients with cardiovascular disease need to be weighed against the possibility of death from anaphylaxis.⁵

Injection of epinephrine 0.3 mg from either Auvi-Q or EpiPen results in similar peak epinephrine levels and total epinephrine exposure.⁶ Auvi-Q, reintroduced in the US in 2017, has a compact rectangular shape and provides visual signals and step-by-step audio instructions for use. Compared with pen-type auto-injectors, it is more convenient to carry and easier to use, has additional safety features including an automatic fully retractable needle, and is less likely to cause unintentional injuries.^{7,8}

The recommended dose of epinephrine is 0.01 mg/kg (0.5 mg maximum) intramuscularly. However, all epinephrine auto-injectors provide epinephrine in fixed doses of 0.15 or 0.3 mg. Auto-injectors containing 0.15 mg are labeled for children weighing 15-30 kg, and those containing 0.3 mg are labeled for adults and children weighing ≥ 30 kg. No auto-injector provides an optimal dose for children weighing between 15 and 30 kg; some clinicians prescribe an auto-injector containing 0.3 mg for children who weigh ≥ 25 kg. Since no weight-appropriate low dose for infants is available in any auto-injector, many physicians prescribe a 0.15-mg auto-injector (off-label) for this age group.⁹

After injection of epinephrine, patients should be taken to the nearest emergency department for observation because anaphylaxis symptoms recur within hours in up to 20% of patients. Intravenous fluids and oxygen may be required in cases of severe anaphylaxis. H₁-antihistamines and corticosteroids are not recommended for treatment of anaphylaxis in community settings; they

Table. Epinephrine Auto-Injectors

Drug	Formulations ^a	Cost ^b
Epinephrine injection, USP		
Generic (Mylan) ^c	0.15 mg/0.3 mL, 0.3 mg/0.3 mL	\$300.00 300.00
EpiPen Jr (Mylan)	0.15 mg/0.3 mL	608.60
EpiPen	0.3 mg/0.3 mL	608.60
Epinephrine injection, USP ^d		
Generic (Impax)	0.15 mg/0.15 mL,	395.20 ^{e,f}
Adrenaclick (Impax) ^g	0.3 mg/0.3 mL	460.90 ^e
Epinephrine injection, USP		
Auvi-Q (Kaléo) ^h	0.15 mg/0.15 mL, 0.3 mg/0.3 mL	See footnote "i"

^a The dose of epinephrine is 0.15 mg for patients who weigh 15-30 kg and 0.3 mg for those who weigh ≥ 30 kg.

^b Approximate WAC for one package containing two auto-injectors. Wholesaler acquisition cost (WAC) or manufacturer's published price to wholesalers; WAC represents a published catalogue or list price and may not represent an actual transactional price. Source: AnalySource Monthly. April 5, 2017. Reprinted with permission by First Databank Inc. All rights reserved. ©2017. www.fdbhealth.com/policies/drug-pricing-policy.

^c Interchangeable with EpiPen and EpiPen Jr.

^d Adrenaclick and its generic equivalent are similar to EpiPen and EpiPen Jr in size and functionality, but they are not considered interchangeable due to differences in device design and instructions for use.

^e Both strengths cost the same.

^f Both strengths are available at CVS for a cash price of \$110.00 for two auto-injectors.

^g Adrenaclick is no longer being manufactured; its generic equivalent will continue to be marketed after supplies of Adrenaclick are depleted.

^h Auvi-Q is not interchangeable with other currently available epinephrine auto-injectors.

ⁱ Manufacturer's list price (WAC) is \$4500.00. However, according to the manufacturer, the out-of-pocket cost is \$0 for all commercially insured patients, whether or not their insurer covers the device. The cash price for patients without government or commercial insurance is \$360 for those with a household income \geq \$100,000/year and \$0 for those with a household income < \$100,000/year.

do not prevent or relieve airway obstruction, hypotension or shock, or prevent death.

Insect Stings and Bites

Small local allergic reactions to insect stings and bites (itchy red swellings) are self-limited. Large local reactions that occur at the sites of stings from honeybees, yellowjackets, wasps, and fire ants, or bites from mosquitoes, deer flies, and other insects, can involve a large portion of the face or an entire extremity and cause extreme discomfort. For prevention and treatment of large local reactions, an oral second-generation H₁-antihistamine such as cetirizine should be used as soon as possible after the sting or bite. For mild or moderate large local reactions, a topical corticosteroid cream can be applied to the affected area for 5-7 days. Oral prednisone 1 mg/kg once daily (maximum daily dose 50 mg)

for 5-7 days may be needed for severe large local reactions. Although the risk of anaphylaxis in patients with large local reactions to stinging insects is <5%, epinephrine auto-injectors are often prescribed for these patients. Venom immunotherapy is effective in preventing large local reactions and can be considered for those with occupational or other unavoidable exposure to stinging insects who frequently require treatment for reactions to stings.¹⁰

ARTICLE INFORMATION

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