Rapid overview: Emergency management of anaphylaxis in adults

Diagnosis is made clinically:

The most common signs and symptoms are cutaneous (eg, sudden onset of generalized urticaria, angioedema, flushing, pruritus). However, 10 to 20% of patients have no skin findings.

Danger signs: Rapid progression of symptoms, respiratory distress (eg, stridor, wheezing, dyspnea, increased work of breathing, persistent cough, cyanosis), vomiting, abdominal pain, hypotension, dysrhythmia, chest pain, collapse.

Acute management:

The first and most important treatment in anaphylaxis is epinephrine. There are **NO absolute contraindications to epinephrine** in the setting of anaphylaxis.

Airway: Immediate intubation if evidence of impending airway obstruction from angioedema. Delay may lead to complete obstruction. Intubation can be difficult and should be performed by the most experienced clinician available. Cricothyrotomy may be necessary.

Promptly and simultaneously, give:

- **IM epinephrine (1 mg/mL preparation):** Give epinephrine 0.3 to 0.5 mg intramuscularly, preferably in the mid-outer thigh. Can repeat every 5 to 15 minutes (or more frequently), as needed. If epinephrine is injected promptly IM, most patients respond to one, two, or at most, three doses. If symptoms are not responding to epinephrine injections, prepare IV epinephrine for infusion.
- **Place patient in recumbent position**, if tolerated, and elevate lower extremities.
- **Oxygen:** Give 8 to 10 L/minute via facemask or up to 100% oxygen, as needed.
- **Normal saline rapid bolus:** Treat hypotension with rapid infusion of 1 to 2 liters IV. Repeat, as needed. Massive fluid shifts with severe loss of intravascular volume can occur.
- **Albuterol (salbutamol):** For bronchospasm resistant to IM epinephrine, give 2.5 to 5 mg in 3 mL saline via nebulizer, or 2 to 3 puffs by metered dose inhaler. Repeat, as needed.

Adjunctive therapies:

- **H1 antihistamine*:** Consider giving cetirizine 10 mg IV (given over 2 minutes) or diphenhydramine 25 to 50 mg IV (given over 5 minutes) - for relief of urticaria and itching only.
- **H2 antihistamine*:** Consider giving famotidine 20 mg IV (given over 2 minutes).
- **Glucocorticoid*:** Consider giving methylprednisolone 125 mg IV.
- **Monitoring:** Continuous noninvasive hemodynamic monitoring and pulse oximetry monitoring should be performed. Urine output should be monitored in patients receiving IV fluid resuscitation for severe hypotension or shock.

Treatment of refractory symptoms:

Epinephrine infusion[¶]**:** For patients with inadequate response to IM epinephrine and IV saline, give epinephrine continuous infusion, beginning at **0.1 mcg/kg/minute** by infusion pump[Δ]. Titrate the dose continuously according to blood pressure, cardiac rate and function, and oxygenation.

Vasopressors[¶]**:** Some patients may require a second vasopressor (in addition to epinephrine). All vasopressors should be given by infusion pump, with the doses titrated continuously according to blood pressure and cardiac rate/function and oxygenation monitored by pulse oximetry.

Glucagon: Patients on beta-blockers may not respond to epinephrine and can be given glucagon 1 to 5 mg IV

over 5 minutes, followed by infusion of 5 to 15 mcg/minute. Rapid administration of glucagon can cause vomiting.

Instructions on how to prepare and administer epinephrine for IV continuous infusions are available as separate tables in UpToDate.

IM: intramuscular; IV: intravenous.
* These medications should not be used as initial or sole treatment.
¶ All patients receiving an infusion of epinephrine and another vasopressor require continuous noninvasive monitoring of blood pressure, heart rate and function, and oxygen saturation.
Δ For example, the initial infusion rate for a 70 kg patient would be 7 mcg/minute. This is consistent with the recommended range for non-weight-based dosing for adults, which is 2 to 10 mcg/minute. Non-weight-based dosing can be used if the patient's weight is not known and cannot be estimated.

Adapted from: Simons FER. Anaphylaxis. J Allergy Clin Immunol 2010; 125:S161.

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