

Acute management of anaphylaxis

These guidelines are intended for primary care physicians and nurses providing first responder emergency care.

Anaphylaxis definition

Any **acute onset illness** with **typical skin features** (urticarial rash or erythema/flushing, and/or angioedema), **PLUS** involvement of **respiratory** and/or **cardiovascular** and/or persistent severe **gastrointestinal** symptoms.

OR

Any **acute onset** of **hypotension** or **bronchospasm** or **upper airway obstruction** where anaphylaxis is considered possible, **even if typical skin features are not present.**

Signs and symptoms of allergic reactions

Mild or moderate reactions

- Swelling of lips, face, eyes
- Hives or welts
- Tingling mouth
- Abdominal pain, vomiting (these are signs of anaphylaxis for insect allergy)

Anaphylaxis

Watch for **any one** of the following signs of anaphylaxis:

- Difficult/noisy breathing
- Swelling of tongue
- Swelling/tightness in throat
- Difficulty talking and/or hoarse voice
- Wheeze or persistent cough
- Persistent dizziness or collapse
- Pale and floppy (young children)
- Vomiting and/or abdominal pain for insect stings/bites

Immediate action

1. Remove allergen (if still present).
2. Call for assistance.
3. Lay patient flat. Do not allow them to stand or walk. If breathing is difficult, allow them to sit.
4. **Give INTRAMUSCULAR INJECTION (IMI) OF ADRENALINE (epinephrine) without delay using an adrenaline autoinjector if available OR adrenaline ampoules and syringe.**
 - **1:1000 IMI** into outer mid-thigh
 - 0.01mg per kg up to 0.5mg per dose
 - Repeat every 5 minutes as needed.
 - If multiple doses required or a severe reaction, consider adrenaline infusion if skills and equipment available.

Adrenaline (epinephrine) dosages chart			
Age (years)	Weight (kg)	Vol. adrenaline 1:1000	Adrenaline autoinjector
<1	5-10	0.05-0.1 mL	
1-2	10	0.1 mL	10-20 kg (~1-5yrs) 0.15mg (green labelled device)
2-3	15	0.15 mL	
4-6	20	0.2 mL	
7-10	30	0.3 mL	>20kg (~>5yrs) 0.3mg (yellow labelled device)
10-12	40	0.4 mL	
>12 and adults*	>50	0.5 mL	

*For pregnant women, a dose of 0.3mg should be used.

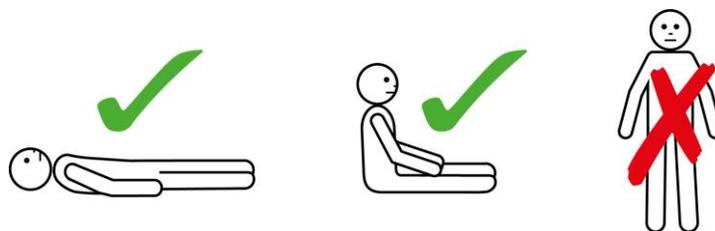
5. Call ambulance to transport patient if not already in a hospital setting.

If required at any time, commence cardiopulmonary resuscitation.

ALWAYS give adrenaline autoinjector FIRST, then asthma reliever if someone with known asthma and allergy to food, insects or medication has SUDDEN BREATHING DIFFICULTY (including wheeze, persistent cough or hoarse voice) even if there are no skin symptoms.

Positioning of patient

- Laying the patient flat will improve venous blood return to the heart.
- By contrast, placing the patient in an upright position can impair blood returning to the heart, resulting in insufficient blood for the heart to circulate and low blood pressure.
- The left lateral position is recommended for patients who are pregnant to reduce the risk of compression of the inferior vena cava by the pregnant uterus and thus impairing venous return to the heart.
- Fatality can occur within seconds if a patient stands or sits suddenly.
- For mainly respiratory reactions, the patient may prefer to sit and this may help support breathing and improve ventilation. BEWARE this may trigger hypotension. Monitor closely. Immediately lay the patient flat again, if there is any alteration in conscious state or drop in blood pressure.
- If vomiting, lay the patient on their side (recovery position).
- Patients must **not** be walked to/from the ambulance, even if they appear to have recovered.
- Infographics are included in ASCIA Action Plans to reinforce correct positioning.



Supportive management (when skills and equipment available)

- Check pulse, blood pressure, ECG, pulse oximetry, conscious state.
- Give high flow oxygen if available and airway support if needed.
- Obtain IV access in adults and hypotensive children.
- If hypotensive, give IV normal saline 20mL/kg rapidly and consider additional wide bore IV access.

Additional measures - IV adrenaline infusion in clinical setting

If inadequate response or deterioration start IV adrenaline infusion, given by staff who are trained in its use or in liaison with an emergency/critical care specialist.

- Mix 1 mL of 1:1000 adrenaline in 1000 mL of normal saline.
- Start infusion at 5 mL/kg/hour (~0.1 µg/kg/minute).
- Titrate rate up or down according to response.
- Monitor continuously.

IV adrenaline infusions should be used with a dedicated line, infusion pump and anti-reflux valves wherever possible.

CAUTION: IV boluses of adrenaline are NOT recommended without specialised training as they may increase the risk of cardiac arrhythmia.

Additional measures to consider if IV adrenaline infusion is ineffective

For Upper airway obstruction	<ul style="list-style-type: none"> • Nebulised adrenaline (5mL i.e. 5 ampoules of 1:1000). • Consider intubation if skills and equipment are available
For persistent hypotension/shock	<ul style="list-style-type: none"> • Give normal saline (maximum of 50mL/kg in first 30 minutes). • Glucagon (1-2mg IM or IV as starting dose) especially for patients on beta blockers or has heart failure. • In adults, selective vasoconstrictors metaraminol (2-10mg) or vasopressin (10-40 units) only after advice from an emergency medicine/critical care specialist.
For persistent wheeze	<p>Bronchodilators:</p> <ul style="list-style-type: none"> • Salbutamol 8 - 12 puffs of 100µg using a spacer OR 5mg salbutamol by nebuliser. • Note: Bronchodilators do not prevent or relieve upper airway obstruction, hypotension or shock <p>Corticosteroids:</p> <ul style="list-style-type: none"> • Oral prednisolone 1 mg/kg (maximum of 50 mg) or intravenous hydrocortisone 5 mg/kg (maximum of 200 mg). • Note: Steroids must not be used as a first line medication in place of adrenaline.

Antihistamines and corticosteroids

Antihistamines:

- Antihistamines have no role in treating or preventing respiratory or cardiovascular symptoms of anaphylaxis.
- Do not use oral sedating antihistamines as side effects (drowsiness or lethargy) may mimic some signs of anaphylaxis.
- **Injectable promethazine should not be used** in anaphylaxis as it can worsen hypotension and cause muscle necrosis.

Corticosteroids:

- The benefit of corticosteroids in anaphylaxis is unproven.
- It is common practice to prescribe a 2-day course of oral steroids (e.g. oral prednisolone 1 mg/kg, maximum 50 mg daily) to hopefully reduce the risk of symptom recurrence after a severe reaction or a reaction with marked or persistent wheeze.

Observe patient for at least 4 hours after last dose of adrenaline

Relapse, protracted and/or biphasic reactions may occur. Patients require overnight observation if they:

- Had a severe or protracted anaphylaxis (e.g. required repeated doses of adrenaline or IV fluid resuscitation), OR
- Have a history of asthma or severe/protracted anaphylaxis, OR
- Have other concomitant illness (e.g. asthma, history of arrhythmia), OR
- Live alone or are remote from medical care, OR
- Present for medical care late in the evening.

The true incidence of biphasic reactions is estimated to occur following 3-20% of anaphylactic reactions.

Follow up treatment

Adrenaline autoinjector

- If there is a risk of re-exposure (e.g. stings, foods, unknown cause) then prescribe an adrenaline autoinjector before discharge, pending specialist review.
- Teach the patient how to use the adrenaline autoinjector using a trainer device and give them an ASCIA Action Plan for Anaphylaxis (see ASCIA website www.allergy.org.au).

Allergy specialist referral

- Refer ALL patients who present with anaphylaxis for specialist review
- The allergy specialist will:
 - Identify/confirm cause.
 - Educate regarding avoidance/prevention strategies, management of comorbidities.
 - Provide ASCIA Action Plan for Anaphylaxis - preparation for future reactions.
 - Initiate immunotherapy where available (some insect venoms).

Documentation of episodes

Patients should be advised to document the circumstances of episodes of anaphylaxis to facilitate identification of avoidable causes (e.g. food, medication, herbal remedies, bites and stings, co-factors like exercise) in the 6-8 hours preceding the onset of symptoms.

The ASCIA allergic reactions event record form can be used to collect this information
www.allergy.org.au/health-professionals/anaphylaxis-resources/anaphylaxis-event-record

Preparation: Equipment required for acute management of anaphylaxis

The equipment on your emergency trolley should include:

- Adrenaline 1:1000 (consider adrenaline autoinjector availability in rural locations for initial administration by nursing staff)
- 1ml syringes; 21 gauge needles
- Oxygen
- Airway equipment, including nebuliser and suction
- Defibrillator
- Manual blood pressure cuff
- IV access equipment (including large bore cannulae)
- Pressure sleeve (aids rapid infusion of fluid under pressure)
- At least 3 litres of normal saline

Acknowledgements

The information in these guidelines is consistent with the Australian Prescriber Anaphylaxis Management wall chart www.australianprescriber.com

These guidelines are based on the following international guidelines:

- International Liaison Committee on Resuscitation (ILCOR) and Australian and New Zealand Committee on Resuscitation (ANZCOR) guidelines
- American Academy of Allergy, Asthma and Immunology (AAAAI) anaphylaxis parameter
- World Allergy Organisation (WAO) anaphylaxis guidelines