INTRODUCTION

Allergic reactions exist on a continuum from mild urticaria (hives) and/or angio-oedema (swelling of the face, eyelids, lips and tongue) to major pulmonary and/or cardiovascular compromise. The extreme end of the spectrum is anaphylaxis which can affect the cardiovascular, pulmonary, cutaneous, and gastrointestinal systems. It is an acute, life-threatening response in patients previously sensitised to an allergen. In general, the longer it takes for anaphylactic symptoms to develop, the less severe the overall reaction.

### Table 1 – Common precipitants

<table>
<thead>
<tr>
<th>Food-induced anaphylaxis</th>
<th>Food is the most common cause of anaphylaxis, particularly peanuts, tree nuts (e.g. hazel, brazil, walnut), fish and shellfish. Facial oedema, laryngeal oedema and respiratory difficulty usually predominate.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insect sting-induced anaphylaxis</td>
<td>Insect stings are the second most common cause. Bees may leave a venom sac which should be scraped off (not squeezed). Injected allergens commonly result in cardiovascular compromise, with hypotension and shock predominating.</td>
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<tr>
<td>Drug-induced anaphylaxis</td>
<td>Medications, particularly penicillin, account for a large percentage of anaphylactic reactions. Slow release drugs prolong absorption and exposure to the allergen.</td>
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<tr>
<td>Other causes</td>
<td>Include latex, exercise, and semen.</td>
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</tbody>
</table>

ASSESSMENT

Primary Survey

Assess ABCD’s

Examine skin for:

- urticaria
- swelling around or within the mouth.

If the history is compatible, i.e. exposure to a possible precipitant, consider an **acute allergic** reaction when the patient presents with:

- an acute onset of illness (minutes to hours) **and**
- cutaneous findings (e.g. urticaria and/or angio-oedema).

Suspect an **anaphylactic reaction** if, in addition to the above, the patient’s condition has deteriorated to include:

- airway compromise (e.g. dyspnoea, hoarseness, stridor, wheeze, throat or chest tightness) **and/or**
- cardiovascular symptoms (e.g. hypotension, syncope, pronounced tachycardia).

**NOTE:** Urticaria and/or angio-oedema are absent in 10%-15% of anaphylactic reactions but consider the diagnosis in an otherwise typical presentation. Gastrointestinal oedema/ hypermotility can result from an anaphylactic event; patients present with colicky abdominal pain, diarrhoea, nausea and vomiting. Patients may report a ‘sense of doom’.

If **signs of anaphylaxis are identified**, immediately correct A and B problems (administer oxygen (O₂) (**refer to oxygen protocol for administration and information**)) and adrenaline (**refer to adrenaline protocol for administration and information**), then pre-alert and transfer to the nearest suitable hospital as an emergency case. Continue management en-route.

Some patients relapse hours after an apparent recovery (**biphasic response**), therefore: **patients who have experienced an anaphylactic reaction should be transferred to hospital for further evaluation.**

**Specifically assess:**

- airway patency (auscultation, pulse oximetry, and peak expiratory flow (PEF) – if possible)
- cardiovascular status (ECG and BP) a systolic blood pressure <90mmHg indicates hypotension
- if the patient has a history of allergic/ anaphylactic reactions
- if the patient has used their own home auto-injector (EpiPen)
- monoamine-oxidase inhibitor (MAOI) or tricyclic antidepressants increase the risk of cardiac arrhythmias, therefore **patients taking MAOI’s or tricyclic antidepressants should receive only 50% of the usual dose of adrenaline.**
If the patient has taken beta-adrenergic blockers, these may mask the signs of anaphylaxis and diminish the effects of adrenaline.

**MANAGEMENT**

**Allergic Reaction:**
Start correcting:
- AIRWAY
- BREATHING
- CIRCULATION
  - determine whether the history and physical findings are compatible with an allergic reaction
  - quickly remove the triggering source (if possible)
  - consider chlorphenamine (IV) (*refer to chlorphenamine protocol for dosages and information*) if the symptoms are causing the patient pain or distress. The balance between relief of symptoms and having to cannulate the patient should be carefully considered.

**Anaphylaxis:**
Start correcting:
- AIRWAY
- BREATHING
- CIRCULATION
  - determine whether the history and physical findings are compatible with anaphylaxis (early diagnosis and management dramatically improves outcome)
  - quickly remove the triggering source (if possible)
  - administer high concentration oxygen (O₂) (*refer to oxygen guideline*) via a non-re-breathing mask, using the stoma in laryngectomee and other neck breathing patients, to ensure an oxygen saturation (SpO₂) of >95%, except in patients with chronic obstructive pulmonary disease (COPD) (*refer to COPD guideline*)
  - administer adrenaline (IM) (*refer to adrenaline protocol for dosages and information*)
  - where call to hospital time is likely to be over 30 minutes consider hydrocortisone (*refer to hydrocortisone protocol for dosages and information*) Its effect can take 4-6 hours but it may minimise the likelihood and severity of a biphasic response
  - if haemodynamically compromised, place the patient in the recumbent position with lower limbs elevated, if tolerated (unhelpful with breathing difficulties)
  - obtain IV access if possible but **DO NOT** delay transfer to hospital
  - consider nebulised salbutamol (*refer to salbutamol protocol for dosages and information*) for bronchospasm resistant to IM epinephrine
  - administer chlorphenamine IV (*refer to chlorphenamine protocol for dosages and information*)
  - consider titrating aliquots of 250 millilitres crystalloid solution if hypotension does not respond rapidly to drug treatment
  - monitor and re-assess ABC’s including ECG, PEF (if possible), BP and pulse oximetry, en-route.

**Key Points – Anaphylaxis/allergic reactions**
- Anaphylaxis can occur despite a long history of previously safe exposure to a potential trigger.
- Consider anaphylaxis in the presence of acute cutaneous symptoms and airway or cardiovascular compromise.
- Anaphylaxis may be rapid, slow or biphasic.
- Oxygen and adrenaline 1:1,000 are the key drugs for managing anaphylaxis.
- The benefit of using appropriate doses of epinephrine (IM) far exceeds any risk.

**REFERENCES**


**METHODOLOGY**

Refer to methodology section; see below for anaphylaxis/allergic reactions search strategy.

**Electronic databases searched:**
- MEDLINE (Ovid)
- CINAHL (Ovid)
- COCHRANE (Ovid)
- EMBASE (Ovid)
- BRITISH NURSING INDEX (Ovid)

The dates were limited to 2000 onwards. Only articles relevant to pre-hospital care were reviewed.

**Search strategy:**
1. first aid/ or emergency health service/ or emergency service/
2. exp EMERGENCY CARE/
3. exp EMERGENCY TREATMENT/
4. exp EMERGENCY MEDICAL SERVICES/
5. or/1-4
6. exp HYPERSENSITIVITY/
7. exp ANAPHYLAXIS/
8. (anaphyla$ or allerg$).tw.
9. 6 and 8
10. (5 and 7) or (5 and 9)
11. limit 10 to yr=2000-2005
12. limit 11 to English
13. remove duplicates from 12