3.7 ALLERGIC REACTIONS - MANAGEMENT OF

A. DEFINITION

Allergy: A hypersensitivity reaction mediated via the immune system involving mast cell degranulation and/or inflammatory cell activation in response to an allergenic stimulus. Allergens are generally either proteins or drugs and the reactions are usually reproducible.

Anaphylaxis is a severe, life-threatening, systemic hypersensitivity reaction, which must be treated urgently.

B. BACKGROUND

- Allergen exposure can occur as a consequence of ingestion, inhalation or contact with skin/mucosal membranes. The subsequent allergic reaction can cover a spectrum of severity from mild to life threatening anaphylaxis.
- The commonest allergens encountered in children are foods, particularly dairy products, egg, nuts, seeds and legumes. Aeroallegen and venom allergies are also seen and, rarely, latex.
- Most suspected reactions to drugs are viral rashes (including urticaria due to viral illness) rather than allergy. Unless there is good evidence of a reaction which is presumed to be due to a medication, do not label a child as being allergic to a particular drug.

C. DIAGNOSTIC FEATURES

History:
- Previous reaction/s.
- Contact with known allergen.
- History of atopy.

Do not stop to take a detailed history in suspected anaphylaxis.
### 3.7 ALLERGIC REACTIONS - MANAGEMENT OF

<table>
<thead>
<tr>
<th>Mild – Moderate reactions</th>
<th>Symptoms</th>
<th>Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Itching of skin, lips, eyes, nose, mouth, throat</td>
<td>Urticarial rash</td>
<td>Angio-oedema</td>
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<tr>
<td>Nausea</td>
<td></td>
<td>Conjunctivitis</td>
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<tr>
<td>Abdominal pain</td>
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<tr>
<td>Vomiting</td>
<td></td>
<td></td>
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<tr>
<td>Diarrhoea</td>
<td></td>
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<tr>
<td>Change in behaviour</td>
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</tr>
<tr>
<td>Severe</td>
<td>Coughing</td>
<td>Bronchospasm</td>
</tr>
<tr>
<td>(Anaphylaxis)</td>
<td>Wheezing</td>
<td>Tachycardia</td>
</tr>
<tr>
<td>Difficulty in breathing</td>
<td></td>
<td>Pallor</td>
</tr>
<tr>
<td>Hoarseness</td>
<td></td>
<td>Respiratory distress</td>
</tr>
<tr>
<td>Change in voice</td>
<td></td>
<td>Laryngeal oedema</td>
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<tr>
<td>Drooling</td>
<td></td>
<td>Hypotension</td>
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<tr>
<td>Collapse</td>
<td></td>
<td>Respiratory arrest</td>
</tr>
<tr>
<td>Incontinence</td>
<td></td>
<td>Cardiac arrest</td>
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</tbody>
</table>

### D. EMERGENCY MANAGEMENT OF ANAPHYLAXIS

Anaphylaxis is a potentially life-threatening allergic reaction.

Recognise anaphylaxis based on:

- Sudden onset and rapid progression of symptoms
- Airway and/or Breathing and/or Circulation problems
- Accompanying skin and/or mucosal changes (urticaria, angioedema).

**Remember:**
- Skin or mucosal changes alone are not a sign of an anaphylactic reaction
- Skin and mucosal changes can be subtle or absent in up to 20% of anaphylaxis (some patients can have only a decrease in blood pressure i.e. a circulation problem)

**NOTE:** the **INTRAMUSCULAR ROUTE** is the preferred route for initial administration of adrenaline *except if there is cardiac arrest/life threatening shock.*

Please follow the refractory anaphylaxis algorithm if there is no improvement in respiratory or cardiovascular symptoms despite 2 appropriate doses of intramuscular adrenaline.
3.7 ALLERGIC REACTIONS - MANAGEMENT OF

Anaphylaxis

Anaphylaxis?

A = Airway  B = Breathing  C = Circulation  D = Disability  E = Exposure

Diagnosis – look for:
- Sudden onset of Airway and/or Breathing and/or Circulation problems
- And usually skin changes (e.g. itchy rash)

Call for HELP
Call resuscitation team or ambulance

- Remove trigger if possible (e.g. stop any infusion)
- Lie patient flat (with or without legs elevated)
  - A sitting position may make breathing easier
  - If pregnant, lie on left side

Give intramuscular (IM) adrenaline

- Establish airway
- Give high flow oxygen
- Apply monitoring: pulse oximetry, ECG, blood pressure

If no response:
- Repeat IM adrenaline after 5 minutes
- IV fluid bolus

If no improvement in Breathing or Circulation problems despite TWO doses of IM adrenaline:
- Confirm resuscitation team or ambulance has been called
- Follow REFRACTORY ANAPHYLAXIS ALGORITHM

1. Life-threatening problems
   - Airway: Hoarse voice, stridor
   - Breathing: Work of breathing, wheeze, fatigue, cyanosis, SpO₂ <94%
   - Circulation: Low blood pressure, signs of shock, confusion, reduced consciousness

2. Intramuscular (IM) adrenaline
   - Use adrenaline at 1 mg/mL (1:1000) concentration
   - Adult and child >12 years: 500 micrograms IM (0.5 mL)
   - Child 6-12 years: 300 micrograms IM (0.3 mL)
   - Child 6 months to 6 years: 150 micrograms IM (0.15 mL)
   - Child <6 months: 100-150 micrograms IM (0.1-0.15 mL)
   - The above doses are for IM injection only.
   - Intravenous adrenaline for anaphylaxis to be given only by experienced specialists in an appropriate setting.

3. IV fluid challenge
   - Use crystalloid
   - Adults: 500-1000 mL
   - Children: 10 mL/kg
### 3.7 ALLERGIC REACTIONS - MANAGEMENT OF

**Other Medication as indicated:**
- Nebulised Adrenaline 400 micrograms/kg, 0.4 ml/kg of 1:1000 (max 5mg)
- Nebulised Salbutamol - 2.5 - 5mg (2.5mg for under 5 yr, 5mg for over 5 years)
- I.V adrenaline (in cardiac arrest) as per APLS guidelines

**Investigations**
- All children who are treated with adrenaline (IM/nebulised/IO/IV) should have a serum tryptase level tested at the time. This requires a 1ml sample of venous blood in a green bottle and must be obtained as soon as possible.

**Patients on Beta blockers**
Children on beta blockers may present with anaphylaxis which is refractory to usual treatment. They should initially be treated following the above algorithm, however, should there be a failure to respond to this then treatment with Glucagon or Vasopressin should be considered.
3.7 ALLERGIC REACTIONS - MANAGEMENT OF

- Glucagon dosing 20 to 30 micrograms/kg (maximum 1 mg) slow IV bolus over five minutes. May be followed by an infusion of 5 to 15 micrograms/minute titrated to effect (ie, not weight-based).

- Vasopressin (Argipressin) is only available on PCCU, the PCCU inotrope infusion guideline is available on the intranet. If needed contact PCCU and ask a member of staff to make up the infusion.

E. FURTHER MANAGEMENT

<table>
<thead>
<tr>
<th>Consider fast-track discharge (after 2 hours observation from resolution of anaphylaxis) if:</th>
<th>Minimum 6 hours observation after resolution of symptoms recommended if:</th>
<th>Observation for at least 12 hours following resolution of symptoms if any one of the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good response (within 5 – 10 minutes) to a single dose of adrenaline given within 30 minutes of onset of reaction and Complete resolution of symptoms and The child already has 2 unused adrenaline auto-injectors and child/parents have been trained how to use them and There is adequate supervision following discharge</td>
<td>Two doses of intramuscular adrenaline needed to treat the reaction or Previous biphasic reaction</td>
<td>Severe reaction requiring &gt; 2 doses of adrenaline The child has severe asthma or the reaction involved severe respiratory compromise There is the possibility of continuing absorption of allergy i.e. slow release medications The child presents late at night, or may not be able to respond to any deterioration Children in areas where access to emergency care is difficult</td>
</tr>
</tbody>
</table>

Ideally, children who have had an anaphylaxis should be seen by the allergy nurse specialist prior to discharge. If this is not possible, discharge shouldn’t be delayed. Ensure that appropriate outpatient referrals are made (see section G).

All adverse drug reactions causing anaphylaxis should be reported via the yellow card system ([https://yellowcard.mrha.gov.uk](https://yellowcard.mrha.gov.uk)).

Prior to discharge ensure the following is provided and documented:
- A minimum of 2x Adrenaline autoinjectors prescribed (4 to be prescribed for children primary school aged or younger) and training in their use provided. Nursing colleagues...
are able to train families before discharge and there is a checklist and ‘Adrenaline auto-injector box ‘available within ED, which contains QR codes to training videos.

- Written Allergy Management Plan (find on BSACI website under Professional Resources: Paediatric Allergy Action Plans - BSACI)
- Family educated about symptoms of anaphylaxis and possibility of a biphasic reaction
- Family given advice to avoid the precipitating allergen
- In the case of drug reactions, a drug allergy referral form should be completed.
- A new referral to the Allergy Service is made, or allergy team advised of attendance to arrange follow-up of existing Allergy patients.

F. MANAGEMENT OF MILDEN ALLERGIC REACTIONS

- REMOVE ALLERGEN

Children who experience mild signs and symptoms should be treated with an oral antihistamine in liquid form – please note these doses are different from those in the BNFc in some cases. Antihistamines are not recommended as part of the initial emergency treatment for anaphylaxis and their use must not delay treatment with adrenaline.

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
</tr>
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<tbody>
<tr>
<td>1 month - 2 years (or under 10 kg)</td>
<td>Chlorphenamine or Cetirizine</td>
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<tr>
<td>2-6 yrs</td>
<td>Cetirizine</td>
</tr>
<tr>
<td>&gt;6 yrs</td>
<td>Cetirizine</td>
</tr>
</tbody>
</table>

Prior to discharge ensure the following:

- Antihistamines at the above doses are available at home (liquid or tablets)
- A written allergy management plan is provided (find on BSACI website under Professional Resources: Paediatric Allergy Action Plans - BSACI)
- The discharging Doctor should complete an EDMS allergy referral form (or an allergy nurse referral form sent in the internal post if unavailable) for new patients.

MANAGEMENT OF URTICARIAL RASHES LASTING > 24 HOURS

Urticaria and angioedema lasting more than 24 hours is highly unlikely to have been triggered by food. It is more commonly seen in virally induced urticaria or chronic idiopathic urticaria, or sometimes secondary to aeroallergens as pollens. These ongoing urticarial rashes should be treated with a course of oral cetirizine at BNFc doses and suggest GP follow-up if not resolving.
3.7 ALLERGIC REACTIONS - MANAGEMENT OF

G. REFERRAL TO THE ALLERGY SERVICE
- Referral to allergy clinic (via EDMS form)
  o Presentation with anaphylaxis
  o Food-induced allergic reactions
  o Discharge diagnosis of drug allergy (see ‘Background’ section above.)
  o Chronic Urticaria (occurring at least 3 times a week for over 6 months)

Do not refer:
- Idiopathic or viral urticaria lasting less than 6 months where food trigger unlikely
- Non-anaphylactic reactions to pets/animals

- Uncontrolled asthma significantly increases the risk of a severe reaction to food allergens therefore if concerns re. poor asthma control, refer to asthma nurse and allergy team.

Ref: resuscitation council [www.resus.org.uk/pages/reaction.pdf](http://www.resus.org.uk/pages/reaction.pdf) updated May 2021
Ref: APLS 6th edition

(Section 3.7 updated by Dr E Herrieven, Nov 2023)
(Section 3.7 reviewed and updated By Dr S Gibbs, Rebecca Scott (ED nursing team), Dr H Collis (Allergy team) May 2022)
(Section 3.7 reviewed by Dr A Rawnsley, May 2019)
(Section 3.7 rewritten and updated by Dr J.Cumberland, May 2009)