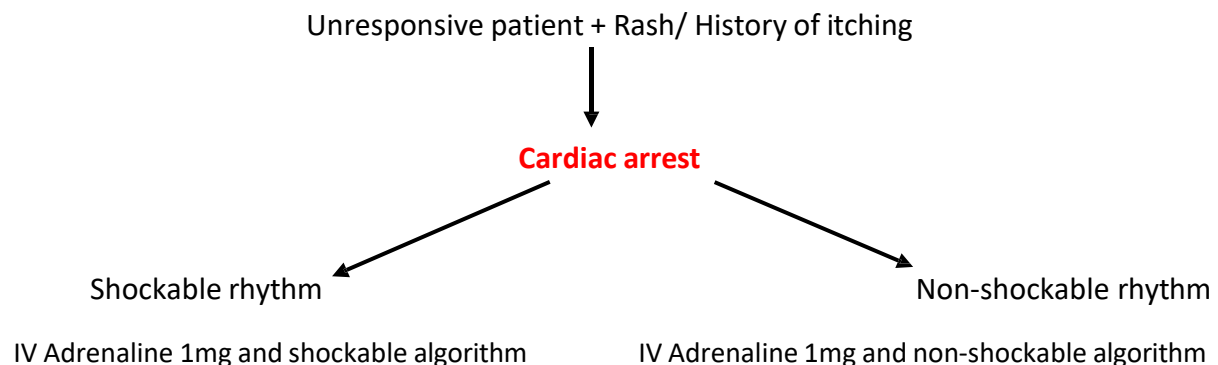
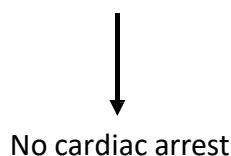


## Allergy and Angioedema



### Notes (1)

- ❖ Need both IV adrenaline bolus (cardiac arrest protocol, 1 mg every 2-3 minutes) AND aggressive fluid resuscitation in addition to CPR (Normal Saline 20mL/kg stat, through a large bore IV under pressure, repeat if no response)
- ❖ Do not give up too soon - this is a situation when prolonged CPR should be considered, because the patient arrested rapidly with previously normal tissue oxygenation and has a potentially reversible cause.



### **Anaphylaxis (1)**

#### ASCIA defines anaphylaxis as:

- 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**.

#### **Criteria 1**

- Acute onset of an illness (minutes to several hours) with simultaneous involvement of the skin, mucosal tissue, or both (e.g. generalized hives, pruritus or flushing, swollen lips-tongue-uvula), and at least one of the following:
- a) Respiratory compromise (e.g. dyspnea, wheeze-bronchospasm, stridor, reduced peak expiratory flow, hypoxemia).
- b) Reduced blood pressure or associated symptoms of end-organ dysfunction (e.g. hypotonia [collapse], syncope, incontinence).
- c) Severe gastrointestinal symptoms (e.g. severe crampy abdominal pain, repetitive vomiting), especially after exposure to non-food allergens.

## Criteria 2

- Acute onset of hypotension or bronchospasm or laryngeal involvement after exposure to a known or highly probable allergen for that patient (minutes to several hours), even in the absence of typical skin involvement.

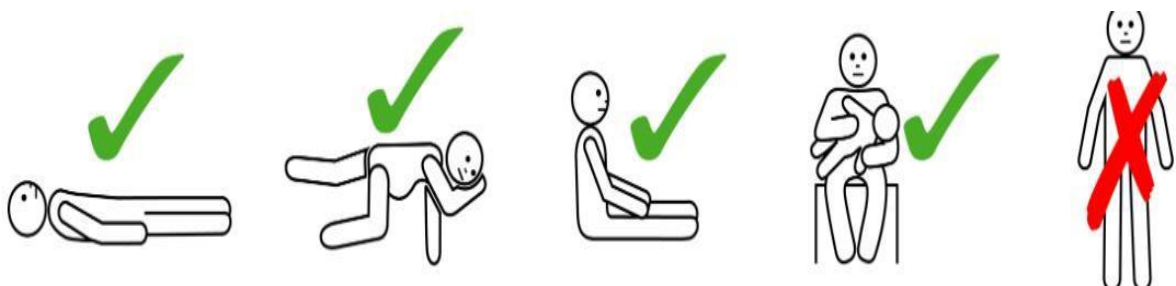
### Signs and symptoms of allergic reaction (1)

Mild and Moderate allergic reactions	Anaphylaxis
Swelling of lips, face, eyes	Difficult or noisy breathing
Hives or welts	Swelling of tongue
Tingling mouth	Swelling or tightness in throat
Abdominal pain, vomiting	Difficulty talking or hoarse voice
Swelling of lips, face, eyes	Wheeze or persistent cough - unlike the cough in asthma, the onset of coughing during anaphylaxis is usually sudden
	Persistent dizziness or collapse
	Pale and floppy (young children)
	Abdominal pain, vomiting - for insect stings or injected drug (medication) allergy.
Oral Antihistamine/ Oral Steroids	IM Adrenaline/ IV Antihistamine/ IV Steroids

### Management of anaphylaxis (1)

#### Immediate action

1. **Remove allergen** (if still present), stay with person, call for assistance and locate adrenaline injector.
  2. **LAY PERSON FLAT** - do NOT allow them to stand or walk
- If unconscious or pregnant, place in recovery position - on left side if pregnant, as shown below
  - If breathing is difficult allow them to sit with legs outstretched
  - Hold young children flat, not upright



3. **GIVE ADRENALINE INJECTOR** - Give intramuscular injection (IMI) adrenaline into outer mid-thigh without delay using an adrenaline autoinjector if available OR adrenaline ampoule/syringe. Adrenaline (epinephrine) is the first line treatment for anaphylaxis- adult dosage- IM adrenalin 0.5ml (1:1000)

## Supportive management

- Monitor pulse, blood pressure, respiratory rate, pulse oximetry, conscious state.
- Give high flow oxygen (6-8 L/min) and airway support if needed.
- Supplemental oxygen should be given to all patients with respiratory distress, reduced conscious level and those requiring repeated doses of adrenaline.
- Supplemental oxygen should be considered in patients who have asthma, other chronic respiratory disease, or cardiovascular disease.
- Obtain intravenous (IV) access in adults and in hypotensive children.
- If hypotensive:
  - Give intravenous normal saline (20 mL/kg rapidly under pressure), and repeat bolus if hypotension persists.
  - Consider additional wide bore (14 or 16 gauge for adults) intravenous access.

## Adrenalin Dosage (1)

Age (years)	Weight (kg)	Volume (mL) of adrenaline 1:1,000 ampoules*	Adrenaline injector devices (for use instead of ampoules)
~<1	<7.5	0.1 mL	Not available
~1-2	10	0.1 mL	7.5-20 kg (~<5yrs) 150 microgram device**
~2-3	15	0.15 mL	
~4-6	20	0.2 mL	
~7-10	30	0.3 mL	>20 kg (~>5yrs) 300 microgram device***
~10-12	40	0.4 mL	
~>12 and adults	>50	0.5 mL	>50 kg (~12 years) 500 microgram**** or 300 microgram devices

\*Adrenaline 1:1,000 ampoules contain 1mg adrenaline per 1mL

\*\*EpiPen® Jr is a 150 microgram (0.15 mg) device.

\*\*\*EpiPen® is a 300 microgram (0.3 mg) device.

\*\*\*\*Anapen® 500 is a 500 microgram (0.5 mg) device.

### Additional measures(1)

wheeze present	<ul style="list-style-type: none"><li>➤ Bronchodilators: Salbutamol 8-12 puffs of 100microgram (spacer) or 5mg (nebuliser).</li></ul> <p>Note: <b>Bronchodilators must not be used as first line medication for anaphylaxis as they do not prevent or relieve upper airway obstruction, hypotension or shock.</b></p> <ul style="list-style-type: none"><li>➤ Corticosteroids: Oral prednisolone 1 mg/kg (maximum of 50 mg) or intravenous hydrocortisone 5 mg/kg (maximum of 200 mg).</li></ul> <p>Note: Steroids must not be used as a first line medication in place of adrenaline as the benefit of corticosteroids in anaphylaxis is unproven.</p>
persistent hypotension/ shock	<ul style="list-style-type: none"><li>➤ Give normal saline (maximum of 50mL/kg in first 30 minutes).</li></ul> <p>Glucagon</p> <ul style="list-style-type: none"><li>➤ In adults, selective vasoconstrictors only after advice from an emergency medicine/critical care specialist.</li></ul>
For upper airway obstruction	<ul style="list-style-type: none"><li>➤ Nebulised adrenaline (5mL e.g. 5 ampoules of 1:1000).</li><li>➤ Consider need for advanced airway</li></ul>

### Refractory Anaphylaxis (1)

If there is an inadequate response after 2-3 adrenaline doses or deterioration of the patient, start IV adrenaline infusion, given by staff trained in its use or in liaison with an emergency specialist.

The protocol for 100 mL normal saline is as follows:

- Mix 1 mL of 1:1,000 adrenaline in **100 mL** of normal saline.
  - Initial rate adjusted accordingly to **0.5 mL/kg/hour** (~0.1 microgram/kg/minute).
  - Should only be given by infusion pump.
- Monitor continuously – ECG and pulse oximetry and frequent non-invasive blood pressure measurements as a minimum to maximise benefit and minimise risk of overtreatment and adrenaline toxicity.

### Management of anaphylaxis in pregnancy (1)

- same as for non-pregnant women
- Left lateral position
- Adrenaline should be the first line treatment for anaphylaxis (1:1,000 IM adrenaline 0.01mg per kg up to 0.5mg per dose)

### **Mild to moderate allergic reaction Management**

- ✓ Oral antihistamine
- ✓ Identify the cause and prevent triggers
- ✓ No place for oral steroids in acute mild allergic reactions
- ✓ Immunology specialist referral if recurrent

### **Disposition plan**

Observe for 4 hours after giving adrenaline Severe

allergy/ anaphylaxis- admit

Mild or moderate allergy- if stable can discharge with action plan and immunology referral

## **Angioedema**

small blood vessels leak fluid into the tissues under the skin, causing swelling in different parts of the body (2)

### **Signs and symptoms (2)**

<b>Angioedema with hives (urticaria)</b>	<b>Angioedema without hives</b>
Pink or red itchy rashes, that may appear as blotches or raised red lumps (wheals) on the body with swelling under the skin that feels itchy, hot, tingly, or burning.	<ul style="list-style-type: none"><li>• Large swollen areas under the skin, that look red and are itchy, hot, tingly, burning or generally uncomfortable.</li><li>• In some people, skin-coloured swellings, that are not itchy, red, or uncomfortable may appear.</li></ul>

### **Types of angioedema (2)**

<b>Acquired</b>	<b>Hereditary angioedema (HAE)</b>
Viral infection	low levels (deficiency) or reduced effectiveness of C1-inhibitor enzyme.
Food or drug allergy	Acquired C1-inhibitor deficiency
ACEI medications	
Thyroid disease, Arthritis	
Autoimmune	

### **Management (2)**

- Symptoms may disappear over time
- Avoid the triggers that make symptoms worse
  - Excessive heat, eating spicy foods, and alcohol consumption.
  - Pain relief medications - an alternative such as paracetamol may reduce symptoms.
  - ACE (angiotensin converting enzyme) inhibitors - angiotensin 2 receptor blockers are usually considered safe.
- Antihistamines (3)
- Hereditary angioedema- Purified C1 inhibitor concentrate/ Bradykinin B2 receptor antagonist (Icatibant) or FFP in acute stage
- ACEI induced angioedema- Discontinue ACEI. FFP may be beneficial if severe.
- If severe (lip/eye swelling) – add oral prednisolone 25-50mg- tapered over 5-7days or IV Methylprednisolone 60-80 mg followed by oral prednisolone taper

## Allergy and angioedema

### Indications for admission

1. Anaphylaxis/ adrenaline given
2. Abnormal vital parameters in non-anaphylaxis allergic reaction after 4 hours of monitoring.
3. Angioedema with ongoing risk of airway obstruction, e.g.: hoarseness/ stridor despite initial emergency treatment.
4. Angioedema with severe GI involvement and loose stools warranting IV fluids.
5. Pregnant women presenting with allergy/anaphylaxis.
6. Social circumstances preventing reliable observation at home/ difficult access to hospital/living alone.

### Note:

Recurrent anaphylaxis to known / unknown trigger- 1 dose of adrenaline drawn up to syringe for pre-hospital use. To be changed every month if not used.