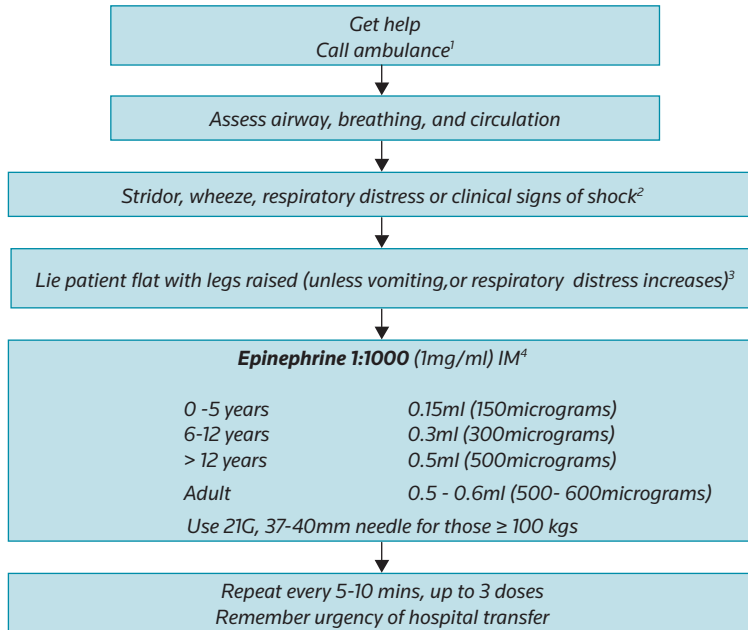


## Anaphylaxis: Treatment in the Community

Anaphylaxis is likely if a patient who, within minutes of exposure to a trigger (allergen), develops a sudden illness with rapidly progressing skin changes and life-threatening airway and/or breathing and/or circulation problems.



1. Ambulance will be equipped with oxygen, Salbutamol and fluids.
2. If profound shock judged immediately life threatening, give CPR/BLS if necessary.
3. If respiratory distress present, elevate head.
4. IM into middle third of anterolateral thigh; maximum effect 10 minutes after IM injection.

NOTE: Immediate administration of adequate doses of epinephrine will decrease patient mortality and morbidity. All patients with signs of a systemic reaction, especially hypotension, airway swelling, or difficulty breathing, should receive immediate intramuscular (IM) epinephrine in the anterolateral thigh.

The anterolateral thigh is superior to IM administration in the deltoid or subcutaneous injection

## Anaphylaxis

### Suggested Anaphylaxis Kit

The availability of protocols, equipment and drugs necessary for management of anaphylaxis should be checked before each vaccination session

- Copy of "Anaphylaxis: Treatment in the Community" from Immunisation Guidelines for Ireland
- 3 x 1 ml ampoules of epinephrine (1:1000, 1mg/ml)

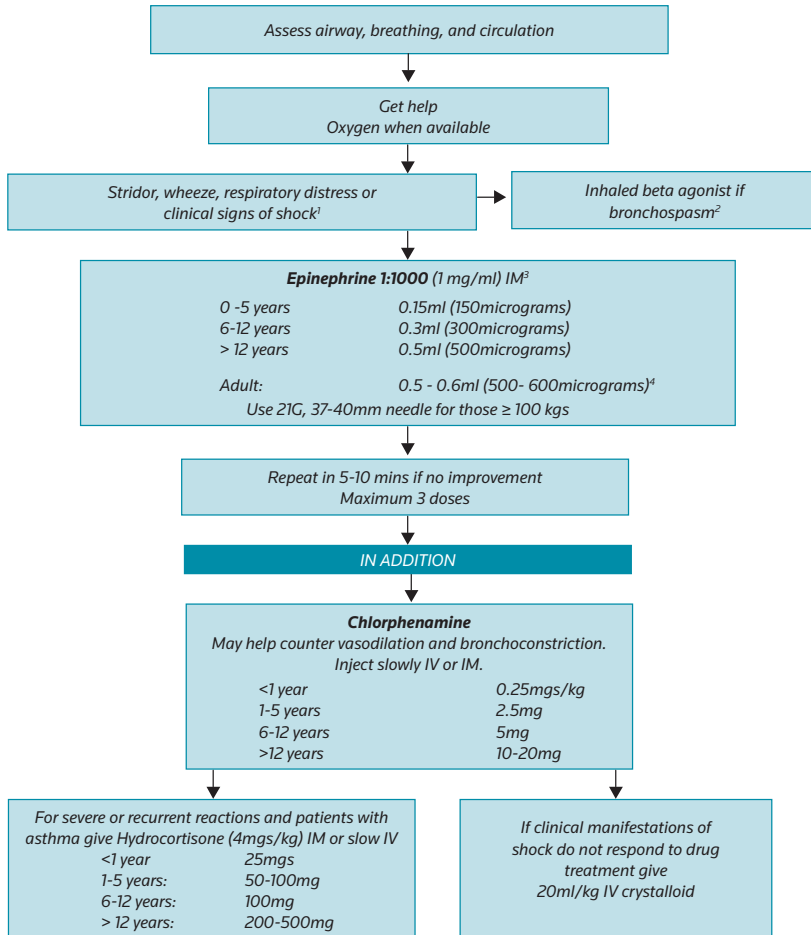
or

- 6 x Epinephrine auto-injectors, 150 mcg, 300 mcg and/or 3 x 500 mcg\* (depending on age of vaccinees)
- 3 x 1 ml syringes
- Needles 3 x 16mm, 3 x 25mm, 3 x 37-40mm
- 1 pocket mask
- Sphygmomanometer (optional)
- Stethoscope (optional)
- Pen and paper to record time of administration of epinephrine.

The kits should be kept closed to ensure the drugs are not exposed to light and stored at room temperature. The kits require regular checking to replace drugs before their expiry date.

\* Ensure that 500mcg auto-injectors have 25mm needles

## Anaphylaxis: Treatment by First Medical Responders (in GP surgery or hospital)



1. If profound shock judged **immediately** life threatening, give CPR/ALS if necessary. Consider **slow** IV Epinephrine 1:10,000 solution if severe hypotension. Dose 10 microgram/kg, maximum dose 500 micrograms, over several minutes. This is **hazardous** and is recommended only for hospital setting. Note the different strength for IV use.
2. An inhaled beta2-agonist (e.g. salbutamol) may be used if bronchospasm is severe and has not responded to epinephrine.
3. IM into middle third of anterolateral thigh; maximum effect 10 minutes after IM injection.
4. If a patient on beta-blockers has not improved after 2-3 doses of Epinephrine, consider giving Glucagon, 2-3 micrograms/kg (max.1-2mg) IV over 5 minutes, IV salbutamol and/or IV atropine.

NOTE: Immediate administration of adequate doses of epinephrine will decrease patient mortality and morbidity. All patients with signs of a systemic reaction, especially hypotension, airway swelling, or difficulty breathing, should receive immediate intramuscular (IM) epinephrine in the anterolateral thigh.

The anterolateral thigh is superior to IM administration in the deltoid or subcutaneous injection

## Anaphylaxis

### ANAPHYLAXIS

#### Definition of anaphylaxis\*

Anaphylaxis is a clinical syndrome characterised by

- sudden onset AND
- rapid progression of signs and symptoms AND
- involving 2 or more organ systems, as follows:

Skin	<ul style="list-style-type: none"> <li>• generalized urticaria or erythema</li> <li>• angioedema, localised or generalised</li> <li>• generalised pruritus with skin rash</li> </ul>
Cardiovascular	<ul style="list-style-type: none"> <li>• measured hypotension</li> <li>• uncompensated shock</li> </ul>
Respiratory	<ul style="list-style-type: none"> <li>• bilateral wheeze (bronchospasm)</li> <li>• stridor</li> <li>• upper airway swelling (lip, tongue, throat, uvula or larynx)</li> <li>• respiratory distress—2 or more of the following:               <ul style="list-style-type: none"> <li>- tachypnoea</li> <li>- increased use of accessory respiratory muscles</li> <li>- recession</li> <li>- cyanosis</li> <li>- grunting</li> </ul> </li> </ul>

There can also be gastrointestinal symptoms (e.g. vomiting, severe abdominal pain, diarrhoea)

Anaphylaxis is a life-threatening allergic reaction, with rapid release of histamine and synthesis of inflammatory mediators. This results in capillary leakage, mucosal oedema and ultimately shock and asphyxia. It is caused by foreign protein antigens such as food, drugs, vaccines and bee stings. It is a very rare complication of immunisation (0.4-2 per million doses). Most episodes begin within 30 minutes of vaccination.

It can vary in severity and rate of progression with manifestations over a few minutes or may be delayed for hours, adding to diagnostic difficulty. Shorter intervals to onset generally indicate more severe reactions. When possible, patients should remain in the vicinity for up to 15 minutes after vaccination.

Once anaphylaxis is believed likely, immediate administration of epinephrine should occur.

Biphasic or late phase reactions, in which patients have a recurrence of symptoms and signs several hours after the initial episode, have been described in up to 20% of cases. They often occur after symptoms of

anaphylaxis have resolved, can be more difficult to treat than the initial episode, and often require intubation. Patients should therefore be observed in hospital for at least 12 hours after severe episodes of anaphylaxis.

Most patients respond to a single dose of intramuscular epinephrine, particularly if it is given promptly after the onset of symptoms. When additional doses are required, typically one or rarely two further doses are needed (e.g. in those with severe anaphylaxis and those who cannot access emergency care promptly). Retrospective studies indicate that a second dose is necessary in up to 36% of cases.

Anaphylaxis must be distinguished from fainting (vasovagal episode), anxiety, breath-holding episodes and idiopathic urticaria or angioedema, which are more common.

**Table 1: Differentiating Vasovagal episode and Anaphylaxis**

		Vasovagal episode	Anaphylaxis
<b>Onset</b>		Immediate	Usually within 5 minutes, but can be delayed for hours
<b>Symptoms/signs</b>	<b>Skin</b>	Generalised pallor; cold, clammy skin	Itch, generalised erythema, urticaria or angioedema (localised swelling of face, mouth, etc.)
	<b>Respiratory</b>	Normal or shallow, not laboured	Cough, wheeze, stridor, tachypnoea, recession, cyanosis
	<b>Cardiovascular</b>	Bradycardia but strong carotid pulse Hypotension corrected when lying	Tachycardia, weak/absent pulse. Sustained hypotension unless specific treatment
	<b>Neurological</b>	Light-headed, possible loss of consciousness, improves on lying down	Severe anxiety and distress. Loss of consciousness

Table 1 shows features which may assist differentiating fainting from anaphylaxis. Those experiencing **anxiety** may appear fearful, pale and sweaty, and complain of light-headedness, dizziness and numbness or tingling of their hands or feet. Hyperventilation is usually present.

During a **breath-holding episode** the child is suddenly silent and may be agitated. Facial flushing or pallor can occur as breath-holding continues. Some episodes end with resumption of crying, but others can be followed by a brief period of unconsciousness during which breathing resumes.

Swelling and an urticarial rash may appear at the injection site but are not always caused by an allergic reaction and may disappear without additional treatment. However if any other symptoms occur, even if considered mild (sneezing, nasal congestion, coughing, etc.), Epinephrine should be given. There is little risk to the use of Epinephrine, especially in children, whereas delay in its administration in anaphylaxis may result in death. The features of anaphylaxis include obstructive swelling of the upper airway, marked bronchospasm and hypotension.

A number of drugs may interfere either with the action of Epinephrine or with the compensatory mechanisms which occur in anaphylaxis. These drugs include beta-blockers, tricyclic antidepressants, ACE inhibitors, and Angiotensin 2 receptor blockers.

As anaphylaxis is a life-threatening event, the benefits of giving the recommended doses of Epinephrine outweigh potential risks. Epinephrine doses should be titrated according to their effect. If a patient on beta-blockers has not improved after 2-3 doses of Epinephrine, consider giving Glucagon, 2-3 micrograms/ kg (max. 1-2mgs) IV over 5 minutes, IV salbutamol, and/ or IV atropine. These should only be used in hospital, preferably under the supervision of an intensivist.

## Bibliography

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4. Simons FE, Gu X, Simons KJ. Epinephrine absorption in adults: intramuscular versus subcutaneous injection. *J Allergy Clin Immunol.* 2001;108:871-873