

# Adrenaline autoinjector (EpiPen) for acute allergic anaphylaxis

This review of adrenaline autoinjector was first published in December 2003. This update describes the change to the PBS listing to allow prescribing immediately after hospital treatment of allergy-related anaphylaxis with adrenaline, without the previous requirement to first consult a specialist.

## Summary

- A change to the PBS listing means that an EpiPen can be prescribed immediately after hospital treatment for anaphylaxis, without the previous requirement that the prescriber or patient consult a specialist.
- Prescribing an EpiPen is only a small part of managing patients with allergic anaphylaxis.
- Ensure that all patients prescribed an EpiPen have a management plan that includes:
  - referral to a specialist
  - how to avoid triggers
  - education of patients, carers and schools (for children)
  - an anaphylaxis action plan
  - appropriate follow-up and review.
- Even when patients have an EpiPen they often do not use them when needed in an emergency. Train patients to recognise the signs of anaphylaxis and how to use the EpiPen properly.
- EpiPens have a short shelf life; advise patients to check expiry dates regularly.
- See the Australasian Society of Clinical Immunology and Allergy website at [www.allergy.org.au/anaphylaxis](http://www.allergy.org.au/anaphylaxis) for consumer and health professional anaphylaxis resources.

## PBS listing

### Authority required

For emergency treatment of acute allergic reactions with anaphylaxis:

- when risk and clinical need has been assessed by, or in consultation with, a clinical immunologist, allergist, paediatrician or respiratory physician
- after hospital or emergency department discharge for acute allergic anaphylaxis treated by adrenaline.

The authority notes the need for a comprehensive anaphylaxis prevention program and patient action plan. Maximum quantity is one, except for children less than 17 years old, who are eligible for two EpiPens.

## Reason for PBS listing

The listing change (August 2006) allows patients to be prescribed an EpiPen immediately after adrenaline treatment in hospital for an episode of anaphylaxis; this ensures that there is no delay between hospital discharge and EpiPen prescription.

Adrenaline autoinjectors were originally listed on the Pharmaceutical Benefits Scheme in December 2000 on the basis of cost effectiveness compared with placebo. Although the autoinjectors were thought likely to reduce the risk of hospitalisation and death, cost estimates were uncertain because of the unknown size of the 'at risk' population, the potential for under-use in emergencies and the high replacement rate due to short shelf life.

## Place in therapy

Adrenaline is the appropriate first-line emergency treatment for life-threatening anaphylaxis.<sup>1</sup> Early administration of adrenaline can reduce the risk of hospitalisation and death in people at significant risk of anaphylaxis.<sup>2</sup>

Surveys show that only 30–50% of patients who have access to an EpiPen in an anaphylactic episode actually use it.<sup>2,3</sup> Ensure that patients are confident about when and how to use the EpiPen:

- Check that patients and carers know how to use the EpiPen and reinforce this at repeat visits. Rehearsal with an EpiPen trainer (a dummy EpiPen without a needle) can help.
- Make sure that patients and carers have an anaphylaxis action plan that shows when and how to use the EpiPen for an anaphylactic reaction. Advise patients and carers that, if in doubt, it is better to use the EpiPen; it is more harmful to undertreat anaphylaxis than to overtreat a mild allergic reaction.

### Prescribe EpiPen within a comprehensive anaphylaxis management plan

Prescribing an EpiPen is only one part of anaphylaxis management. All patients at risk of allergic anaphylaxis need an overall plan for management of their anaphylaxis (see Box 1). This usually includes:

- referral to an allergy specialist
- identification of triggers
- education on trigger avoidance
- provision of an anaphylaxis action plan
- ongoing follow-up.

If the patient is a child or adolescent it is important that schoolteachers, carers and others who regularly take responsibility for the child are informed about the condition and its management. EpiPen training and anaphylaxis education for teachers and carers is available from First Aid organisations and through some allergy clinics and State Health initiatives. In NSW, *Anaphylaxis Guidelines for schools*<sup>4</sup> is available from NSW Health or through the NSW Department of Education and Training.

#### Box 1: Anaphylaxis management plan (ASCIA)<sup>5</sup>

- Referral to an allergy specialist
- Identification of anaphylactic trigger(s)
- Comprehensive history, clinical examination and appropriate use and interpretation of allergy testing
- Education on the avoidance of trigger(s) (particularly important with food anaphylaxis)
- Provision of an anaphylaxis action plan. This should document:
  - patient name
  - allergic triggers
  - carer contact details
  - symptoms and signs indicating the need to use the EpiPen
  - instructions on how to use the EpiPen

Anaphylaxis action plans with pictorial instructions for EpiPen use can be found at [www.allergy.org.au/anaphylaxis](http://www.allergy.org.au/anaphylaxis)
- Appropriate follow-up, with review by an allergy specialist to:
  - ascertain if the correct trigger(s) have been identified
  - determine whether the allergy persists
  - provide re-education on EpiPen use
  - renew the action plan
  - ensure that the EpiPen has not expired

### Who should be prescribed an EpiPen?

All patients with a history of allergic anaphylactic reaction should have access to an EpiPen. Patients with a history of generalised allergic reactions but without a previous anaphylactic reaction do not usually need an EpiPen. However, a history of generalised allergic reactions and one or more of the risk factors shown in Table 1 warrants consideration of anaphylaxis risk — refer or consult with a specialist allergist or clinical immunologist.

Note the following points.<sup>5</sup>

- Asthma in combination with a history of a generalised allergic reaction increases the risk of anaphylaxis, particularly when there is a food or insect allergy. Most fatal or severe anaphylactic reactions reported have been in people who also had asthma.<sup>6–8</sup> Asthma control is particularly important, as patients with poorly controlled asthma may be less responsive to beta<sub>2</sub> agonists when needed.<sup>7</sup> However, asthma is not a risk factor for anaphylaxis on its own, and adrenaline is not an emergency treatment for asthma.

**Table 1: Guidelines for prescribing EpiPen (ASCIA\*)****ALWAYS RECOMMENDED****HISTORY OF ANAPHYLAXIS****Anaphylaxis**

A rapidly-evolving, generalised multisystem allergic reaction.

Characterised by one or more symptoms or signs of respiratory and/or cardiovascular involvement and involvement of other systems such as the skin and/or gastrointestinal tract.

**Respiratory symptoms**

- Difficult/noisy breathing
- Swelling of tongue
- Swelling/tightness in throat
- Difficulty talking and/or hoarse voice
- Wheeze or persistent cough

**Cardiovascular symptoms**

- Loss of consciousness
- Collapse
- Pale and floppy (in young children)
- Hypotension

**SOMETIMES RECOMMENDED****HISTORY OF A GENERALISED ALLERGIC REACTION AND ONE OR MORE RISK FACTORS****Generalised allergic reaction (non-anaphylactic)**

Characterised by one or more symptoms or signs of skin, with or without gastrointestinal tract involvement and without respiratory and/or cardiovascular involvement.

**Skin symptoms**

- Generalised pruritus
- Urticaria/angioedema
- Erythema

**Gastrointestinal symptoms**

- Abdominal pain
- Vomiting
- Loose stools

**Risk factors**

- Asthma (current or past history)
- Age (children over 5 years, adolescents and young adults)
- Specific allergic triggers:
  - nut/peanut allergy
  - stinging insect allergy in adults (bees, wasps, jumper ants)
- Comorbidity (e.g. ischaemic heart disease)
- Geographical remoteness from emergency medical care

**NOT NORMALLY RECOMMENDED**

- Asthma with no history of anaphylaxis or generalised allergic reactions
- Elevated specific IgE only (positive RAST and/or skin test) without a history of clinical reactions
- Family (rather than personal) history of anaphylaxis or allergy
- Resolved food allergy
- Generalised skin rash (only) to bee stings — in children
- Local reactions to insect stings — in adults and children

\*Abbreviated from ASCIA guidelines for EpiPen prescribing<sup>5</sup>

- Adolescents and young adults are over-represented in allergy-related anaphylaxis deaths, which less commonly involve children under the age of 5 years.<sup>6-8</sup> This could be due to the greater severity of persisting allergies, the less-controlled environment of teenagers, or lower compliance with carrying adrenaline.
- Nut allergy is a common cause of fatal anaphylaxis<sup>8,9</sup>, and exposure can be difficult to avoid. Subsequent episodes may be more severe than the first reaction.

## Safety issues

The potential harms of anaphylaxis almost always outweigh the potential harms of giving adrenaline.<sup>1</sup>

Advise consumers about adrenaline's short shelf life, the need to check and record expiry dates, and to replace their EpiPen before expiry.

EpiPen should be stored below 25°C and protected from light. In hotter areas of Australia where this may be difficult, a portable cooler could be used. Refrigeration is not advised, as the effect on stability is not certain. Regular checking for discolouration can help detect decay of the adrenaline, but this is not an absolute indicator if recommended temperatures are exceeded.

Incorrect administration may result in accidental injury; training should reduce this risk.

## Adverse drug reactions

Few adverse reactions have been reported with the use of EpiPen autoinjectors. Transient pallor, tremor, anxiety, palpitations or other cardiovascular effects, headache and nausea have been experienced.<sup>10-12</sup>

Report suspected adverse reactions to the Adverse Drug Reactions Advisory Committee (ADRAC) online (see [www.tgasime.health.gov.au](http://www.tgasime.health.gov.au)) or by using the 'Blue Card' distributed with *Australian Prescriber*. For information about reporting adverse drug reactions, see the Therapeutic Goods Administration website ([www.tga.gov.au](http://www.tga.gov.au)).

## Dosing issues

The EpiPen autoinjector is available as EpiPen Jr (150 micrograms) and EpiPen (300 micrograms). It should be administered as an intramuscular injection into the anterolateral thigh. Injection into the buttocks is not recommended because of the greater chance of injecting into fat rather than muscle, while injecting into the extremities (hands, feet, face) may stop blood flow to these areas.

### Box 2: EpiPen doses recommended by ASCIA

Weight	EpiPen strength
Children < 10 kg	Not usually recommended
Children 10–20 kg	EpiPen Jr (150 micrograms)
Children and adults > 20 kg	EpiPen (300 micrograms)

Note: The EpiPen product information suggests EpiPen Jr for children 15–30 kg, and EpiPen for those above 30 kg.<sup>11,12</sup> However, the above doses are consistent with routine intramuscular dosing schedules.

## Information for patients

- Advise patients to seek medical treatment immediately in the case of a severe allergic reaction; further adrenaline or other follow-up may be needed even if the EpiPen is used.
- EpiPens tend to be under-used in emergencies, even when one is available.<sup>2</sup> Teach patients how to use EpiPen and reinforce training when needed (poor recall of correct use is common).<sup>2,3</sup> EpiPen trainers are dummy models without a needle, which can be used to practise the correct use of the EpiPen.
- Ensure that all patients have an emergency action plan (see Box 1). Advise that, if in doubt in an emergency, it is safer to use adrenaline than to have an anaphylactic reaction. Action plan proformas are available from the ASCIA website ([www.allergy.org.au/anaphylaxis](http://www.allergy.org.au/anaphylaxis)).

ASCIA has a range of publications about allergies and anaphylaxis for consumers on its website: [www.allergy.org.au/aer/infobulletins/anaphylaxis.htm](http://www.allergy.org.au/aer/infobulletins/anaphylaxis.htm).

## References

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12. CSL Limited. EpiPen. Product Information, 11 April 2005.

Updated August 2006: PBS listing change to allow prescribing immediately following hospital treatment with adrenaline for anaphylaxis, without the need for patient or prescriber consultation with a clinical immunologist, allergist, paediatrician or respiratory physician.

Updated May 2004: PBS listing change to allow prescribing by or in consultation with respiratory physicians or paediatricians in addition to clinical immunologists or allergists.

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The information contained in this material is derived from a critical analysis of a wide range of authoritative evidence. Any treatment decisions based on this information should be made in the context of the clinical circumstances of each patient.