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Recognising infant anaphylaxis

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Disclosures

DBV-technologies
Allergenis

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Fast facts

- 1 in 10 Australian infants has an IgE mediated food allergy
- The most common triggers for food anaphylaxis in infants are cow's milk, peanut, egg, wheat and tree nuts
- Emergency department Anaphylaxis presentations in infants and young children Australia have risen 2-3 fold over the past 15 years
- Infant feeding guidelines have changed around the world with emphasis on early introduction of allergenic foods into the diet

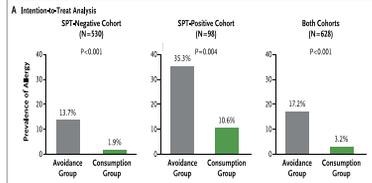
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LEAP Study 

Learning Early About Peanut allergies

Randomized Trial of Peanut Consumption in Infants at Risk for Peanut Allergy, Du Toit, et al: 2015



Cohort	Group	Prevalence of Allergy
SPT-Negative Cohort (N=530)	Avoidance Group	13.7%
	Consumption Group	1.9%
SPT-Positive Cohort (N=98)	Avoidance Group	35.3%
	Consumption Group	10.6%
Both Cohorts (N=628)	Avoidance Group	17.2%
	Consumption Group	3.2%

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ascia **Guidelines**
www.allergy.org.au

Infant feeding and allergy prevention

Key Recommendations

- When your infant is ready, at around 6 months, but not before 4 months, start to introduce a variety of solid foods, starting with iron rich foods, while continuing breastfeeding.
- All infants should be given allergenic solid foods, including peanut butter, cooked egg and dairy and wheat products in the first year of life. This includes infants at high risk of allergy.
- Hydrolysed (partially and extensively) infant formulae are not recommended for prevention of allergic disease.

Introduction

ASCSA has developed these guidelines to outline practices that may help reduce the risk of infants developing allergies, particularly early onset allergic diseases such as eczema and food allergy.

These guidelines are based on current published evidence, including information published after 2010. The revised recommendations listed above are based on a consensus agreement by participants in the Infant Feeding Summit hosted by the Centre for Food & Allergy Research (CFAR) in May 2016.

The reasons for the continued rise in allergic diseases, such as food allergy, eczema, asthma and allergic rhinitis (hay fever) are complex and not well understood. Although infants with a family history of allergic disease are at higher risk of allergic infants with no family history can also develop allergies. Therefore, these guidelines are relevant for all families, including those in which siblings or parents already have food allergies or other allergic conditions.

If your infant already has an allergic disease (such as severe eczema or food allergy), you should discuss what preventative measures might be useful with your doctor.

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High risk introduction GUIDELINES



Guide for introduction of peanut to infants with severe eczema and/or food allergy

This publication outlines and illustrates the high risk procedure for introducing peanut to infants with severe eczema and/or food allergy. These children are at greatest risk of developing a severe allergic reaction to peanut.

Why should this guide be followed?

Infants with severe eczema and/or food allergy are at high risk of developing a severe allergic reaction to peanut. This guide provides a step-by-step procedure for introducing peanut to these infants. It also provides information on how to manage a severe allergic reaction to peanut.

Key points:

- This guide should be used in conjunction with the current UK National Institute for Health Research (NIHR) funded research on the introduction of peanut to infants with severe eczema and/or food allergy.
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- Suggested procedure in document
- Be prepared to treat anaphylaxis

How to recognize anaphylaxis in infants



Anaphylaxis FAST FACTS

- Signs and symptoms of anaphylaxis vary between infants and older children/adults
- Not all reactions will progress from mild/moderate symptoms to anaphylaxis
- Most anaphylaxis presents within one hour of food ingestion- and often onset may be much more rapid
- Cutaneous signs (urticaria, swelling, etc) may be absent
- Most anaphylaxis presentations in the infant and young child are characterized by respiratory, not cardiovascular signs and symptoms
- Delay in use of adrenaline is a risk factor for fatal anaphylaxis

Signs and symptoms of allergic reactions

	MILD TO MODERATE		SEVERE	
	Skin	Gastrointestinal	Respiratory	Cardiovascular
Hives		Vomiting*	Difficult/noisy breathing	Low blood pressure
Swelling		Abdominal pain*	Swelling of tongue	Persistent dizziness or collapse
			Swelling/tightness in throat	Pale and floppy (in young children)
			*These are signs of a severe allergic reaction to insects	Difficulty talking and/or hoarse voice
				Wheeze or persistent cough



Anaphylaxis is a potentially life threatening, severe allergic reaction and should always be treated as a medical emergency.

Symptoms of anaphylaxis are potentially life threatening and include any one of the following:

- Difficult/noisy breathing
- Swelling of tongue
- Swelling/tightness in throat
- Difficulty talking and/or hoarse voice
- Wheeze or persistent cough
- Persistent dizziness and/or collapse
- Pale and floppy (in young children)



Mild to moderate symptoms in infants that may or may not present during anaphylaxis

- Swelling of lips, face, eyes
- Hives or widespread flushing
- Drooling
- Vomiting/regurgitation
- Face (eye, ear, nose) rubbing, sneezing, sudden onset of clear nasal discharge, conjunctival redness
- Itchiness, scratching of face or body
- Irritability, clinging to caregiver



Are the signs and symptoms different for infant anaphylaxis?

Signs and symptoms in children/adults	Signs and symptoms in infants
<ul style="list-style-type: none"> • Difficult/noisy breathing • Swelling of tongue • Swelling/tightness in throat 	<ul style="list-style-type: none"> • Laboured/noisy breathing • Swelling of tongue • Swelling in throat (e.g. drooling, increased secretions)
<ul style="list-style-type: none"> • Difficulty talking and/or hoarse voice 	<ul style="list-style-type: none"> • Change in voice or cry (e.g. hoarseness, croakiness) and/or difficulty vocalising
<ul style="list-style-type: none"> • Wheeze or persistent cough • Persistent dizziness or collapse 	<ul style="list-style-type: none"> • Wheeze, stridor or persistent cough • Collapse • Pale and floppy • Sudden drowsiness • Unresponsiveness

Vital signs for infant anaphylaxis

Respiratory

- Low oxygen saturation
- Rapid resting respiratory rate for age
- Low respiratory rate may indicate impending respiratory arrest
- Low tidal volumes may disguise lower airways obstruction

Cardiovascular

- Hypotension is a late sign in infants due to high peripheral vascular resistance and can represent a pre-arrest sign
- Tachycardia – rapid resting heart rate for age may signal hypotension

Treating anaphylaxis



Action for anaphylaxis

- Remove any suspected trigger (rare in infants)
- Lay the infant flat or semi-reclining in the caregiver's arms. Ensure the infant's leg is held firmly to prevent movement prior to epipen administration.
- If there is any doubt the caregiver will be able to hold the infant still the infant should be placed on a bed and held firmly.

Positioning of infants



It is important to lay the patient flat

- Upright position can lead to insufficient blood returning to the heart
- Laying them flat (and if possible elevating their legs) will improve blood return to the heart
- Fatality can occur within seconds if a patient stands or sits suddenly
- Respiratory reactions - patient may prefer to sit BUT BEWARE this may trigger hypotension
- If vomiting, lay the patient on their side



Lacerations and Embedded Needles Caused by Epinephrine Autoinjector Use in Children

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Why is holding important



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IM into outer mid thigh is recommended

- Give 1:1000 adrenaline IM into the outer mid-thigh
- 0.01 mg/kg
- OR for infants over 7.5kg, a 0.15mg adrenaline autoinjector (e.g. EpiPen® Jr) can be administered



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Adrenaline ampoule



Adrenaline dosage chart for infants (for adrenaline ampoules and syringe)

Age	Weight (kg)	Vol. adrenaline 1:1000
<1	5-10	0.05-0.1 mL
1-2	10	0.1 mL

Source: Adapted from the Australian Immunisation Handbook 9th Edition

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ASCIA adrenaline autoinjector dose recommendations

Age	Dose recommendation
Children <10kg (aged <1 year)	<ul style="list-style-type: none"> • Not usually recommended • In some circumstances a 150 microgram (0.15 mg) device may be prescribed
Children 10-20kg (aged ~1-5 years)	<ul style="list-style-type: none"> • 150 microgram (0.15 mg) device
Adults and children >20kg (aged > ~5 years)	<ul style="list-style-type: none"> • 300 microgram (0.3 mg) device

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Why is adrenaline effective?

- Adrenaline reverses the physiological effect of mediators by acting on adrenergic receptors to:
- Reduce airway mucosal oedema
 - Induce bronchodilation
 - Induce vasoconstriction (thus increasing HR & BP)
 - Increase strength of cardiac contraction

The maximum effects of adrenaline lasts ~15-20 minutes, repeated doses may be needed

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Ref: Tole, Lieberman, 2007

Is it anaphylaxis or asthma (bronchiolitis/croup?)

If the patient is known to be at risk of anaphylaxis and is unsure if they are experiencing anaphylaxis or asthma follow their ASCIA Action Plan for Anaphylaxis:

- Give adrenaline autoinjector first
- Then give asthma reliever/croup medication
- Phone ambulance
- Continue asthma first aid

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How to give EpiPen

1. Form fist around EpiPen® and PULL OFF BLUE SAFETY RELEASE
2. Hold leg still and PLACE ORANGE END against outer mid-thigh (with or without clothing)
3. PUSH DOWN HARD until a click is heard or felt and hold in place for 3 seconds REMOVE EpiPen®

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How to give Emerade

1. REMOVE the needle shield
2. PLACE and PRESS Emerade against the outer side of the thigh (you will hear a click when the injection goes into the muscle)
3. HOLD Emerade against the thigh for 5 seconds REMOVE Emerade

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Further doses of adrenaline may be given

It may be necessary to give further doses of adrenaline when:

- There is no improvement after 5 minutes
- Symptoms of anaphylaxis continue to progress
- Symptoms resolve and then recur

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Adrenaline – possible adverse effects

- Adrenaline is well tolerated in children as well as adults
- Transient adverse effects include anxiety, fear, restlessness, headache, dizziness, palpitations, pallor and tremor
- Overdose- ventricular arrhythmias and pulmonary oedema

IV boluses of adrenaline are NOT recommended

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Respiratory support

When skills and equipment available:

- Give high-flow supplemental oxygen through an infant face mask
- Monitor oxygen saturation, respiratory rate, heart rate and blood pressure keeping infant flat or in semi reclining position

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Biphasic reactions (up to 20%)

Ref: Tox, Lieberman, 2007

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Medical observation

- Relapse, protracted and/or biphasic reactions may occur
- Protracted reactions may be obscured by residual adrenaline after IMI
- Observe patient for at least 4 hours after resolution of symptoms of anaphylaxis
- Observe overnight if patient:
 - had a severe or protracted anaphylaxis, or
 - has a history of asthma or severe/protracted anaphylaxis, or
 - has other concomitant illness, or
 - presents for medical care late in the evening

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Steroids?

- No! These are not a first line treatment
- They take 4-6 hours to work
- ? Role in biphasic reactions

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Antihistamines?

- Antihistamines have **no role** in treating or preventing respiratory or cardiovascular symptoms of anaphylaxis
- Oral **non-sedating** antihistamines may relieve itching, flushing, angioedema, urticaria and nasal and eye symptoms
- **Sedating** antihistamines can cause **drowsiness** and **should not be used**
- **Injectable promethazine should not be used** in anaphylaxis as it can worsen hypotension and cause muscle necrosis
- Administration of **adrenaline should not be delayed** if anaphylaxis is suspected

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Summary

- Anaphylaxis does occur in infants and young children
- Recognising early signs and symptoms is important
- Adrenaline is the first treatment – no other drug is as effective

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First Foods – Around 6 months, but not before 4 months

The first foods you give to your baby need to be smooth, such as pureed food. The food should be sleepy and smooth with no lumps.

The amount the baby eats will vary each day from 1 teaspoon up to 3–4 tablespoons at mealtimes. To start with, offer your baby solid foods once a day. Over time you can offer solid foods 2–3 times a day. Let your baby decide how much to eat.

You can mix a small amount of the common allergy causing food with fruit or vegetable puree or iron-fortified baby cereal. Here are some food ideas:

 <p>Egg</p> <p>Mix a small amount of well-cooked egg (e.g. hard-boiled egg) with baby cereal or vegetable puree.</p>	 <p>Peanut</p> <p>Mix a small amount of peanut flour or smooth peanut butter/jam with baby cereal or fruit puree.</p>
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Feed your baby the common allergy causing foods such as peanut, egg, tree nuts, and cow's milk before your baby is one year of age.

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