NHS Children's Acute Transport Service

CATS Clinical Guideline

Anaphylaxis/Latex Allergy

Document Control Information

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Document Version	Version 5	**Replaces Version**	Version 4
First Introduced		**Review Schedule**	2 Yearly
Active Date	January 2020	**Next Review**	January 2022
CATS Document Number			
Applicable to	All CATS Employees		
Linked documents			

The purpose of this guideline is to provide a structured approach for the treatment of cases of suspected anaphylaxis and suggest precautions to prevent allergic reactions in a patient suspected of latex allergy.

1. Assessment

1.1 Anaphylaxis is likely when all of the following 3 criteria are met:

- Sudden onset and rapid progression of symptoms
- Life-threatening Airway and/or Breathing and/or Circulation problems
- Skin and/or mucosal changes (flushing, urticarial, angioedema)

1.2 A history of exposure to an allergen supports the diagnosis but is not essential.

1.3 Anaphylaxis should be suspected when:

- Previous history of severe or life-threatening reactions
- Previous history of increasingly severe reactions
- History of asthma
- Current treatment with beta-blockers
- 'Medic-alert' bracelet or carries own adrenaline auto-injector

1.4 Common allergens/triggers include:

- Food: nuts, milk, fish
- Venom: wasp, bee
- Drugs: antibiotics, anaesthetic drugs, chlorhexidine
- Contrast media
- Latex

1.5 History of latex allergy usually has to be sought unless this is the presenting complaint

1.6 Risk factors for latex allergy:

- Repeated bladder catheterisation
- Neural tube defects: Spina bifida
- Cloacal abnormalities
- Multiple surgical procedures, especially as a neonate
- Atopy and multiple allergies
- Food allergies: fruit and vegetables including bananas, celery, fig, chestnuts, avocados, papaya and passion fruit are most significant. Children with a strong or confirmed allergy to banana should be considered allergic to latex and managed accordingly.

1.7 Life-threatening features of anaphylaxis include:

- Airway: swelling, hoarse voice, stridor
- Breathing: shortness of breath, tachypnoea, wheeze, cyanosis, respiratory arrest
- Circulation: pale, clammy, tachycardia, low blood pressure, shock, cardiac arrest
- Confusion, agitation or decreased level of consciousness can occur due to above problems

Table 1: Frequency of presenting clinical features of peri-operative anaphylaxis

Clinical feature	Frequency (%)
Hypotension	46
Bronchospasm	18
Tachycardia	10
Flushing/ non urticarial rash	7
Desaturation	4.7
Reduced/absent ETCO2	2.3
Urticaria	2.2

2. Immediate management

2.1 Call for senior help early.

2.2 Patient positioning: lie flat and elevate legs.

2.3 Remove trigger if possible.

2.4 Primary treatment: **Adrenaline**

- Give IM adrenaline 1 in 1000.
- If repeated IM doses required, patient may benefit from IV adrenaline 1 in 10 000.
- If patient requires repeated IV adrenaline boluses, start an IV adrenaline infusion.

IM Adrenaline (1 in 1000) (First line therapy)
< 6 years. 150 mcg (0.15ml)
6 to 12 yrs. 300mcg (0.3 ml)
> 12 yrs. 500mcg (0.5 ml)
Repeated after 5 minutes if required

IV / IO Adrenaline (1 in 10 000)
1 mcg/kg, maximum 50 mcg

IV infusion Adrenaline (0.3mg/kg in 50ml)
run at 0.05-0.5 mcg/kg/min
(refer to CATS drug chart)

2.5 Secondary treatments:

- **High-flow oxygen** (>10L/min via mask and reservoir bag)
- **Establish secure airway** (see Intubation below)
- **Chlorphenamine**
- **Hydrocortisone**
- **Vascular volume expansion 20ml/kg (0.9% Saline or Hartmann's)** – repeat as required
- **Bronchodilators** to manage bronchospasm: **Salbutamol nebulisers 2.5mg - 5mg**
- **Vasopressors –** consider **noradrenaline** infusion ± vasopressin for refractory hypotension

AGE	Chlorphenamine IM or slow IV	Hydrocortisone IM or slow IV
< 6 months	250 micrograms/kg	25 mg
6 months – 6 years	2.5 mg	50 mg
6 – 12 years	5 mg	100 mg
> 12 years	10 mg	200 mg

3. Intubation

3.1 Indications for intubation

- Airway obstruction
- Cardiorespiratory collapse

3.2 Before intubation

3.2.1 If the child has evidence of airway obstruction call for *urgent senior* anaesthetic and ENT support for intubation.

3.2.2 Consider adrenaline 0.5 ml/kg 1:1000 nebulised (maximum 5 ml) while waiting.

3.3 Following intubation

3.3.1 Ventilate as for air trapping/bronchospasm:

- Pressure control (aim PIP <35 cmH_2O)
- Slow respiratory rate (e.g. rate 10-15 bpm)
- Long expiratory time (e.g. I:E 1:2)
- Permissive hypercapnoea - aim pH ≥ 7.2
- PEEP 5-10 cm H_2O to overcome intrinsic PEEP
- Consider manual decompression
- Ensure neuromuscular blockade

3.3.2 Regular chest physiotherapy and suctioning for mucus plugging.

3.3.3 Bronchospasm should be treated as per **asthma guideline**.

3.3.4 Watch for pneumothoraces.

3.3.5 Occasionally an infusion of vasoactive drugs will be necessary, for resistant vasodilation +/or bronchospasm. Discuss use with CATS consultant.

3.3.6 Consider $NaHCO_3$ for profound/refractory acidosis.

4. Cardiopulmonary arrest following an anaphylactic reaction

4.1 Start CPR immediately and follow current APLS cardiopulmonary resuscitation guidelines.

4.2 Use doses of adrenaline recommended in the APLS CPR guidelines.

4.3 The IM route for adrenaline is not recommended after cardiac arrest has occurred.

5. Investigations

5.1 **Mast cell tryptase** levels help confirm the diagnosis of anaphylactic reaction.

5.2 Ideally send three *timed samples* for mast cell tryptase:

- Immediately after reaction has been treated
- 1-2 hours after the start of symptoms.
- At 24 hours or in convalescence (baseline sample) after the reaction

5.3 Each sample should be 0.5mL-5mL of serum or clotted blood ('liver function test' bottle).

5.4 It is essential to record the times on these samples and in the notes.

6. Reporting of reaction

6.1 All adverse drug reactions should be reported to the Medicine and Healthcare products Regulatory Agency (MHRA) using the "Yellow Card" scheme (found in BNF and MIMS).

6.2 The patient must be referred to an allergist in a defined Regional Allergy Centre.

6.3 All fatal cases of suspected anaphylaxis should be discussed with the coroner.

7. Transport considerations for suspected latex allergy

7.1 Use of latex-free anaesthetic masks, ECG electrodes, blood pressure cuffs.

7.2 Drugs from bottles with rubber bungs should be avoided or a Chemo Mini Spike Plus used.

7.3 Drugs for treatment of allergic reactions should be drawn up in advance for patients with suspected latex allergy.

Guideline based on the Advanced Life Support Group UK 2017
NICE Guidance November 2016
NAP 6 Anaesthesia, Surgery and Life Threatening Allergic Reactions Report 2018