# Anaphylaxis in Maternity

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| **CQC Fundamental standards:**<br>Regulation 9 – person centred care<br>Regulation 10 – dignity and respect<br>Regulation 11 – Need for consent<br>Regulation 12 – Safe care and treatment<br>Regulation 13 – Safeguarding service users from abuse and improper treatment<br>Regulation 14 – Meeting nutritional and hydration needs<br>Regulation 15 – Premises and equipment<br>Regulation 16 – Receiving and acting on complaints<br>Regulation 17 – Good governance<br>Regulation 18 – Staffing<br>Regulation 19 – Fit and proper | | | |

## Disclaimer

Since every patient's history is different, and even the most exhaustive sources of information cannot cover every possible eventuality, you should be aware that all information is provided in this document on the basis that the healthcare professionals responsible for patient care will retain full and sole responsibility for decisions relating to patient care; the document is intended to supplement, not substitute for, the expertise and judgment of physicians, pharmacists or other healthcare professionals and should not be taken as an indication of suitability of a particular treatment for a particular individual.

The ultimate responsibility for the use of the guideline, dosage of drugs and correct following of instructions as well as the interpretation of the published material **lies solely with you** as the medical practitioner.

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## Guideline Statement

To ensure the timely recognition and management of anaphylaxis, ensuring care is delivered in accordance with the Resuscitation Council guidance (2021).

## Executive Summary

The UK incidence of anaphylactic reactions is increasing.

- Patients who have an anaphylactic reaction can have life-threatening airway and/or breathing and/or circulation problems usually associated with skin and mucosal changes.
- Patients having an anaphylactic reaction should be recognised and treated using the Airway, Breathing, Circulation, Disability, Exposure (ABCDE) approach.
- The exact treatment will depend on the patient's location, the equipment and drugs available, and the skills of those treating the anaphylactic reaction.
- Early treatment with intramuscular adrenaline is the treatment of choice for patients having an anaphylactic reaction.
- Intravenous adrenaline must only be used in certain specialist settings and only by those skilled and experienced in its use.
- All those who are suspected of having had an anaphylactic reaction should be referred to a specialist in allergy after full recovery.
- Individuals who are at high risk of an anaphylactic reaction should carry an adrenaline auto-injector 'EpiPen' and receive training and support in its use.

## Introduction

Anaphylaxis is an acute, life-threatening allergic reaction, leading to airway, respiratory, circulatory changes and precipitate maternal collapse. Available UK estimates suggest that approximately 1 in 1333 of the population of England has experienced anaphylaxis at some point in their lives. There are approximately 20 deaths from anaphylaxis reported each year in the UK.

## Definitions and Abbreviations

**ABCDE:** Airway, Breathing, Circulation, Disability, Exposure

- **ALS:** Advanced Life Support.
- **Anaphylaxis is severe, life-threatening, generalised or systemic hypersensitivity reaction.** This is characterised by rapidly developing life-threatening airway and/or breathing and/or circulation problems usually associated with skin and mucosal changes.
- **Anaphylactic shock:** poor perfusion of the body's vital organs caused by an anaphylactic reaction.
- Anyone who presents with such signs and symptoms is classed as experiencing a 'suspected anaphylactic reaction', and should be diagnosed as having 'suspected anaphylaxis'.
- **BLS:** Basic Life Support, i.e., CPR without the use of equipment except for airway protective devices.
- **CPR:** cardiopulmonary resuscitation, which refers to chest compressions and ventilations.
- **IM:** intramuscular.
- **IV:** intravenous.

# 1.0 Roles and Responsibilities:

It is the midwives, nurses and obstetrician's responsibility to ensure they are conversant with the contents of this guideline and how to access it.

Patients having an anaphylactic reaction in any setting should expect the following as a minimum from the doctors and midwives providing care:

- Recognition that they are seriously unwell.
- An early call for help.
- Initial assessment and treatments based on an ABCDE* approach.
- Adrenaline therapy if indicated.
- Investigation and follow-up by an allergy specialist.

# 2.0 Implementation and dissemination of document

- Guideline available on the intranet
- Anaphylaxis algorithm available in the bottom drawer of all cardiac arrest trollies in maternity

# 3.0 Processes and procedures

## 3.1 Triggers

Anaphylaxis is an allergic response that can be immunologically mediated, a non-immunologically mediated response, or idiopathic. Common triggers include certain foods, insect venoms, drugs and latex; these often precipitate an immunoglobulin E (IgE)-mediated, massive histamine release, allergic anaphylaxis. Many drugs can also act through nonallergic mechanisms. Of foods, nuts are the most common cause; muscle relaxants, antibiotics, NSAIDs and aspirin are the most commonly implicated drugs.

**Patient-centred care**

Treatment should be instigated rapidly as the reaction can be life-threatening.

Those with a history of anaphylaxis should have the opportunity to make informed decisions about ongoing care and treatment, in partnership with their healthcare professionals.

If patients do not have the capacity to make decisions, healthcare professionals should follow the Department of Health's advice on consent and the code of practice that accompanies the Mental Capacity Act.

Good communication between healthcare professionals and patients is essential. The patient needs to be fully debriefed after treatment for anaphylaxis, this needs to take into account any cultural sensitivity needed. It should also be accessible to people with additional needs such as physical, sensory or learning disabilities, and to people who do not speak or read English.

## 3.2 Mortality

The overall prognosis of anaphylaxis is good, with a case fatality ratio of less than 1% reported in most population-based studies. Risk of death is, however, increased in those with pre-existing asthma, particularly if the asthma is poorly controlled or in those asthmatics who fail to use, or delay treatment with adrenaline. When anaphylaxis is fatal, death usually occurs very soon after contact with the trigger. From a case-series, fatal food reactions cause respiratory arrest typically after 30–35 minutes; insect stings cause collapse from shock after 10–15 minutes; and deaths caused by intravenous medication occur most commonly within five minutes. Death never occurs more than six hours after contact with the trigger.

## 3.3 Diagnosis

A diagnosis of anaphylactic reaction is likely if a patient who is exposed to a trigger (allergen) develops sudden symptoms including

breathing difficulties +/- wheeze +/- stridor,
circulatory collapse (hypotension)
sudden collapse
skin / mucosal changes
possible GI disturbance (D+V)

The lack of any consistent clinical manifestation and a range of possible presentations cause diagnostic difficulty.

### Anaphylaxis is likely when all of the following occur:

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

**Supporting the diagnosis:**

- Exposure to a known allergen for the patient

### a) Sudden onset and rapid progression of symptoms:

The patient will feel and look unwell.

- Most reactions occur over several minutes. Rarely, reactions may be slower in onset.
- The time of onset of an anaphylactic reaction depends on the type of trigger. An intravenous trigger will cause a more rapid onset of reaction than stings which, in turn, tend to cause a more rapid onset than orally ingested triggers
- The patient is usually anxious and can experience a "sense of impending doom".

### b) Life-threatening Airway and/or Breathing and/or Circulation Problems:

**Airway problems:**

- Airway swelling, e.g., throat and tongue swelling (pharyngeal/laryngeal oedema). The patient has difficulty in breathing and swallowing and feels that the throat is closing up.
- Hoarse voice.
- Stridor – this is a high-pitched inspiratory noise caused by upper airway obstruction.

**Breathing problems:**

Shortness of breath – increased respiratory rate.

- Wheeze.
- Confusion caused by hypoxia and tiredness.
- Cyanosis (appears blue) – this is usually a late sign.
- Respiratory arrest.

**Circulation problems:**

- Signs of shock – pale, clammy.
- Increased pulse rate (tachycardia).
- Low blood pressure (hypotension) – feeling faint (dizziness), collapse.
- Decreased conscious level or loss of consciousness.
- Anaphylaxis can cause myocardial ischaemia and electrocardiograph (ECG) changes even in individuals with normal coronary arteries.
- Cardiac arrest.

The above Airway, Breathing and Circulation problems can all alter the patient's neurological status (**Disability problems**) because of decreased brain perfusion. There may be confusion, agitation and loss of consciousness. Patients can also have gastro-intestinal symptoms (abdominal pain, incontinence, vomiting).

### c) Skin and/or mucosal changes:

These should be assessed as part of the **Exposure** when using the ABCDE approach.
They are often the first feature and present in over 80% of anaphylactic reactions.

- They can be subtle or dramatic.
- There may be skin, or mucosal changes, or both.
- There may be erythema – a patchy, or generalised, red rash.
- There may be urticaria (also called hives, nettle rash, weals or welts), which can appear anywhere on the body. The weals may be pale, pink or red, and may look like nettle stings. They can be different shapes and sizes, and are often surrounded by a red flare. They are usually itchy.
- Angioedema is similar to urticaria but involves swelling of deeper tissues, most commonly in the eyelids and lips, and sometimes in the mouth and throat.

Although skin changes can be worrying or distressing for patients and those treating them, skin changes without life-threatening airway, breathing or circulation problems do not signify an anaphylactic reaction. Reassuringly, most patients who have skin changes caused by allergy do not go on to develop an anaphylactic reaction.

**Of note:**

- Skin or mucosal changes alone are not a sign of an anaphylactic reaction
- Skin and mucosal changes can be subtle or absent in up to 20% of reactions (some patients can have only a decrease in blood pressure, i.e., a Circulation problem)
- There can also be gastrointestinal symptoms (e.g. vomiting, abdominal pain, incontinence)

Some patients have systemic allergic reactions that are less severe. For example, generalised urticaria, angioedema, and rhinitis would not be described as an anaphylactic reaction, because the life-threatening features –- an airway problem, respiratory difficulty (breathing problem) and hypotension (circulation problem) –- are not present.

### 3.4 Differential diagnoses

**Life-threatening conditions:**
- Acute asthma attack – can present with similar symptoms– this is commonest in children.
- Septic shock – can present with hypotension with a petechial or purpuric rash.

**Non-life-threatening conditions** (these usually respond to simple measures)
- Faint (vasovagal episode).
- Panic attack.
- Idiopathic (non-allergic) urticaria or angioedema.

### 3.5 Anaphylaxis Management

**For any maternal collapse use an ABCDE approach**

The specific treatment of an anaphylactic reaction depends on:
1. Location.
2.Training and skills of first responders
3.Number of responders.
4.Equipment and drugs available

The key steps for the treatment of an anaphylactic reaction are shown in the Anaphylaxis Algorithm (next page)

1. **REMOVE TRIGGER**
   If the trigger is known then remove from patient contact i.e. stop any drug/IV infusion suspected of causing an anaphylactic reaction.

2. **CALL FOR HELP** (2222) or 999 in the community Request the nearest available cardiac arrest trolley, grab bag or anaphylaxis box. A cardiac arrest trolley can be found on Labour Ward, Wards 9 and 10, Emergency Department ADAU and Outpatients.

3. **AIRWAY** – consider position
   -> if collapsed lie patient flat with head tilt chin lift, with manual displacement of uterus
   -> if still breathing – pt may prefer to sit upright

4. **BREATHING**
   Give high flow oxygen (10-15l/min) in non rebreathe mask
   Aim sats > 94%

5. **CIRCULATION**
   IV access using 2 wide bore cannula and give stat 500 – 1000ml fluid bolus
   Elevate legs if low blood pressure
   If patient feels faint, do not sit up or stand – may cause cardiac arrest

6. **ADRENALINE**
   Give IM Adrenaline, 0.5 ml of 1:1000 solution –.
   Further dose can be administered at 5-minute intervals if A/B/C problems persist
   Adrenaline is best given into the middle third of the thigh.
   IV adrenaline should only be given by experienced health care practitioners

7. **DISABILITY** AVPU score – to monitor conscious level
   Exclude hypoglycaemia

8. **Exposure** – Head to toe – to observe for skin / mucosal changes

## FOR SPECIALIST USE ONLY

Adrenaline IV bolus dose – cardiac monitoring needed to administer IV adrenaline

Titrate IV adrenaline using 50 microgram boluses according to response.

If repeated adrenaline doses are needed, start an IV adrenaline infusion, particularly if there is ongoing respiratory of cardiovascular issues despite 2 doses of IM adrenaline.
The pre-filled 10 mL syringe of 1:10,000 adrenaline contains 100 micrograms/ml. A dose of 50 micrograms is 0.5 mL, which is the smallest dose that can be given accurately. Do not give the undiluted 1:1000 adrenaline concentration IV.

Resuscitation Council UK

GUIDELINES 2021

# Anaphylaxis

**Anaphylaxis?**

**A** = Airway **B** = Breathing **C** = Circulation **D** = Disability **E** = Exposure

## Diagnosis – look for:

- Sudden onset of Airway and/or Breathing and/or Circulation problems[1]
- And usually skin changes (e.g. itchy rash)

## Call for HELP

Call resuscitation team or ambulance

- Remove trigger if possible (e.g. stop any infusion)
- Lie patient flat (with or without legs elevated)
  - A sitting position may make breathing easier
  - If pregnant, lie on left side

## Give intramuscular (IM) adrenaline[2]

Inject at **anterolateral aspect** – middle third of the thigh

- Establish airway
- Give high flow oxygen
- Apply monitoring: pulse oximetry, ECG, blood pressure

## If no response:

- Repeat IM adrenaline after 5 minutes
- IV fluid bolus[3]

**If no improvement in Breathing or Circulation problems[1] despite TWO doses of IM adrenaline:**

- Confirm resuscitation team or ambulance has been called
- Follow REFRACTORY ANAPHYLAXIS ALGORITHM

**1. Life-threatening problems**

**Airway**
Hoarse voice, stridor

**Breathing**
↑work of breathing, wheeze, fatigue, cyanosis, $SpO_2$ <94%

**Circulation**
Low blood pressure, signs of shock, confusion, reduced consciousness

**2. Intramuscular (IM) adrenaline**
Use adrenaline at 1 mg/mL (1:1000) concentration

| | |
|---|---|
| **Adult and child >12 years:** | 500 micrograms IM (0.5 mL) |
| **Child 6–12 years:** | 300 micrograms IM (0.3 mL) |
| **Child 6 months to 6 years:** | 150 micrograms IM (0.15 mL) |
| **Child <6 months:** | 100–150 micrograms IM (0.1–0.15 mL) |

The above doses are for IM injection **only**.
Intravenous adrenaline for anaphylaxis to be given **only by experienced specialists** in an appropriate setting.

**3. IV fluid challenge**
Use crystalloid

**Adults:** 500–1000 mL
**Children:** 10 mL/kg

### 3.6 After the initial resuscitation

- Corticosteroids are no longer advised for routine emergency treatment but can be used if concerns re secondary reaction inject hydrocortisone – 200mg IM or (IV slowly to avoid inducing further hypotension).
- Antihistamines are a third line treatment for an anaphylactic reaction. Used alone, they are unlikely to be life-saving in a true anaphylactic reaction.
  Non sedating oral anti-histamines maybe given after stabilizing treatment if there are persisting symptoms with urticaria or angioedema.
- Nebulised Salbutamol (2.5 mg in 2.5 ml of normal saline) if wheezing (nebuliser and Salbutamol on cardiac arrest trolley).
- If shock is profound or prolonged time restore circulating volume may need HDU/ITU with CVP control.
- Document which drug was thought to have precipitated the anaphylactic reaction.

**Investigations**

- Consider: 12 lead ECG, chest X-ray, urea and electrolytes, arterial blood gases as needed

- Also take blood samples for **mast cell tryptase** (remember to record the timing of each sample accurately) - take 5ml venous blood in a yellow bottle for serum TRYPTASE. Bleep the biochemist via the switchboard before taking the sample so that he/she is ready to receive it.

- Initial sample as soon as feasible after resuscitation has started.
- Second sample at 1-2 hours after the start of reaction.
- Third sample either at 24 hours or in convalescence (e.g. follow-up allergy clinic).

**Any drug reaction should be reported to the Medicines and Healthcare Products Regulatory Agency (MHRA) using the yellow card scheme. Remember to arrange a follow- up by an allergy specialist.**

In case of anaphylaxis please complete **a DATIX form.**

### 3.7 List of recommendations post anaphylactic treatment and discharge from hospital

- Document the acute clinical features of the suspected anaphylactic reaction (rapidly developing, life-threatening problems involving the airway [pharyngeal or laryngeal oedema] and/or breathing [bronchospasm with tachypnoea] and/or circulation [hypotension and/or tachycardia] and, in most cases, associated skin and mucosal changes).
- Record the time of onset of the reaction
- Record the circumstances immediately before the onset of symptoms to help to identify the possible trigger.
- After a suspected anaphylactic reaction in adults or over 16 yrs, take timed blood samples for mast cell tryptase testing as above
- Adults who have had emergency treatment for suspected anaphylaxis should be observed for 6–12 hours from the onset of symptoms, depending on their response to emergency treatment.
- Senior clinician review is needed prior to discharge to ensure no further investigations or prolonged observation is needed, up to 24 hours is recurrence of symptoms suspected

(biphasic reaction).~
This caution is particularly applicable to:

- Severe reactions with slow onset caused by idiopathic anaphylaxis.
- Reactions in individuals with severe asthma or with a severe asthmatic component.
- Reactions with the possibility of continuing absorption of allergen.
- Patients with a previous history of biphasic reactions.
- Patients presenting in the evening or at night, or those who may not be able to respond to any deterioration.
- Patients in areas where access to emergency care is difficult.

- In people with reactions that are controlled promptly and easily, a shorter observation period may be considered provided that they receive appropriate post-reaction care prior to discharge.
- After emergency treatment for suspected anaphylaxis, offer people a referral to a specialist allergy service
- After emergency treatment for suspected anaphylaxis, warn about possibility of recurrence and offer people (or, as appropriate, their parent and/or carer) an appropriate adrenaline injector as an interim measure before the specialist allergy service appointment.

Patients must be given clear instructions to return to hospital if symptoms return.

- Anti-histamines and oral steroid therapy for up to 3 days can be helpful and may decrease the chance of further reaction.
- Have a plan for follow-up including contact with the patients GP.

## 3.8 Specialist referral

All patients presenting with anaphylaxis should be referred to an allergy clinic to identify the cause, and thereby reduce the risk of future reactions and prepare the patient to manage future episodes themselves. There is a list of specialist clinics on the British Society for Allergy and Clinical Immunology (BSACI) website. A list of clinics with a specific interest in anaphylactic reactions during anesthesia is available at the BSACI and Association of Anesthetists of Great Britain and Ireland websites (www.bsaci.org and www.aagbi.org).

## 3.9 Record Keeping

Accurate documentation of potential triggers in woman's maternity notes is an essential

Findings and plan of care need to be clearly discussed with the woman and her family with reference to risk factors and management options.

**Patient education**

- Patients need to know the allergen responsible and how to avoid it. If the allergen is a food, they need to know what products are likely to contain it, and all the names that can be used to describe it.
- Where possible they also need to know how to avoid situations that could expose them to the allergen.

- Patients need to be able to recognize the early symptoms of anaphylaxis, so that they can summon help quickly and prepare to use their emergency medication. Patients at risk are usually advised to carry their adrenaline auto-injector with them at all times.
- Patients and those close to them (i.e., close family, friends, and carers) should receive training in using the auto-injector and should practice regularly using a suitable training device, so that they will know what to do in an emergency

- Patients must always seek urgent medical assistance when experiencing anaphylaxis and after using an adrenaline auto-injector.
- Information about managing severe allergies can be obtained from their allergy specialist, general practitioner, other healthcare professional or the Anaphylaxis Campaign.
- Although there are no randomized clinical trials,
- there is evidence that individualized action plans for self-management should decrease the risk of recurrence.

## 4.0 Statement of evidence/references

## References:

Emergency treatment of anaphylactic reactions: Guidelines for healthcare providers Resuscitation Council UK Updated 2021

Maternal Collapse in Pregnancy and the puerperium. GTG 56, RCOG Jan 2011

# 5.0 Governance

## 5.1 Document review history

| Version number | Review date | Reviewed by | Changes made |
|---|---|---|---|
| 5 | 04/2017 | Kate Ewing | Reviewed |
| 6 | | Anja Johansen-Bibby | |

## 5.2 Consultation History

| Stakeholders Name/Board | Area of Expertise | Date Sent | Date Received | Comments | Endorsed Yes/No |
|---|---|---|---|---|---|
| Matrons, Midwives and Obstetric Staff, Consultants | | 17.8.17 | | | |
| Women's Health CIG | | 04/08/2021 | | Approved | |
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## 5.3 Audit and monitoring

| Audit/Monitoring Criteria | Tool | Audit Lead | Frequency of Audit | Responsible Committee/Board |
|---|---|---|---|---|
| To monitor all cases of anaphylaxis occurring within the maternity service | Datix – forms | Maternity staff | When cases occur | Risk meetings, Labour Ward Forum and Maternity CIG |
| | | | | |
| | | | | |

### 5.4 Equality Impact Assessment

As part of its development, this Guideline and its impact on equality has been reviewed. The purpose of the assessment is to minimise and if possible remove any disproportionate impact on the grounds of race, gender, disability, age, sexual orientation, religion or belief, pregnancy and maternity, gender reassignment or marriage and civil partnership. No detriment was identified. Equality Impact assessments will show any future actions required to overcome any identified barriers or discriminatory practice.

| **Equality Impact Assessment** | | | |
|---|---|---|---|
| Division | | Department | |
| Person completing the EqIA | | Contact No. | |
| Others involved: | | Date of assessment: | |
| Existing policy/service | | New policy/service | |

| | |
|---|---|
| Will patients, carers, the public or staff be affected by the policy/service? | Yes |
| If staff, how many/which groups will be affected? | *For example: community midwives, phlebotomists, all staff* |

| Protected characteristic | Any impact? | Comments |
|---|---|---|
| Age | YES NO | Positive impact as the policy aims to recognise diversity, promote inclusion and fair treatment for patients and staff |
| Disability | YES NO | |
| Gender reassignment | YES NO | |
| Marriage and civil partnership | YES NO | |
| Pregnancy and maternity | YES NO | |
| Race | YES NO | |
| Religion or belief | YES NO | |
| Sex | YES NO | |
| Sexual orientation | YES NO | |

| What consultation method(s) have you carried out? |
|---|
| *For example: focus groups, face-to-face meetings, PRG, etc* |
| How are the changes/amendments to the policies/services communicated? |
| *For example: email, meetings, intranet post, etc* |
| What future actions need to be taken to overcome any barriers or discrimination? |

| What? | Who will lead this? | Date of completion | Resources needed |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| Review date of EqIA | | | |