3-1 Anaphylaxis v.5

- Unexplained hypotension
- Unexplained bronchospasm *(wheeze may be absent if severe)*
- Unexplained tachycardia or bradycardia
- Angioedema *(often absent in severe cases)*
- Unexpected cardiac arrest where other causes are excluded
- Cutaneous flushing in association with one of more of the signs above *(often absent in severe cases)*

START

❶ Call for help. Note the time. Stop or do not start non-essential surgery.

❷ Call for cardiac arrest trolley, anaphylaxis treatment pack and investigation pack.

❸ Remove all potential causative agents and maintain anaesthesia.

- Important culprits: antibiotics, neuromuscular blocking agents, patent blue.
- Consider chlorhexidine as cause (impregnated catheters, lubricants, cleansing agents).
- Consider i.v. colloids as a possible cause.
- Change to inhalational anaesthetic agent (if not already).

❹ Give 100% oxygen and ensure adequate ventilation:

- Maintain the airway and, if necessary, secure it with tracheal tube.

❺ Elevate patient's legs if there is hypotension.

❻ If systolic blood pressure < 50 mmHg or cardiac arrest, start CPR immediately.

❼ Give drugs to treat hypotension (Box A):

- **Hypotension may be resistant and may require prolonged treatment.**
- Give adrenaline bolus and repeat as necessary.
- Consider starting an adrenaline infusion after three boluses.
- If hypotension resistant, give alternate vasopressor (e.g. metaraminol, noradrenaline infusion +/- vasopressin)
- Give glucagon in ß-blocked patient unresponsive to adrenaline.
- Hydrocortisone and chlorphenamine are no longer part of acute treatment (Box C)

❽ Give rapid i.v. crystalloid:

- 20 ml.kg^{-1} initial bolus, repeated until hypotension resolved.
- Fluid requirements may be significant

❾ If bronchospasm is persistent, consider → **3-4**

❿ Take 5-10 ml clotted blood sample for **serum tryptase** as soon as patient is stable.

- Plan for repeat sample at 1-2 hours and >24 hours.

⓫ Plan transfer of the patient to an appropriate critical care area. Note tasks in Box D.

⓬ Prevent re-administration of possible trigger agents (allergy band, annotate notes/drug chart)

Box A: DRUGS TO TREAT HYPOTENSION IF CARDIAC ARREST → 2-1

- Adult adrenaline: i.**v**. 50 µg (= 0.5 ml of 1:**10 000**)
  i.**m**. 0.5 mg (= 0.5 ml of 1:**1000**) *if i.v. not possible*
- Paediatric adrenaline: i.v. 1.0 µg.kg^{-1} (0.1 ml.kg^{-1} of 1:**100 000**)
  [1:**100 000** solution made by diluting 1 ml of 1:**10 000** up to 10 ml]
- If no i.v. access, intraosseous adrenaline dose same as i.v.
- Suggested adrenaline infusion regimes (adult):
  5 mg in 500 mL dextrose = 1:**100 000**, titrate to effect
  3 mg in 50 mL saline. Start at 3 ml.h^{-1} (= 3 µg.min^{-1}), titrate to maximum 40 ml.h^{-1} (= 40 µg.min^{-1})
- Glucagon (adult): 1 mg, repeat as necessary
- Vasopressin (adult): 2 units, repeat as necessary (consider infusion)

Box B: CRITICAL CHANGES

CARDIAC ARREST → QRH SECTION 2-1

Box C: HYDROCORTISONE and CHLORPHENAMINE CHANGES

AFTER initial resuscitation:

- Consider steroids for refractory reactions or ongoing asthma/shock.
- Antihistamines (preferably oral, non-sedating) can be given for skin symptoms.

Box D: DON'T FORGET

- Repeat testing for serum tryptase at 1-2 hours and >24 hours.
- Liaise with hospital laboratory about analysis of samples.
- Liaise with department anaphylaxis lead regarding referral to a specialist allergy or immunology centre to identify the causative agent (see www.bsaci.org for details).
- Inform the patient, surgeon and general practitioner.
- Report to MHRA (https://yellowcard.mhra.gov.uk).
- NAP6 online resource **including anaphylaxis follow-up packs**: http://www.nationalauditprojects.org.uk/NAP6-Resources#pt

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3-2a | Anaphylaxis

v0-8
March 2022

Anaphylaxis is a life-threatening hypersensitivity reaction featuring rapidly developing hypotension and tachycardia, and potentially life-threating airway obstruction or bronchospasm

START

1 Call for help and consider requesting resuscitation trolley

- Identify **team leader**, **allocate roles**, and **note the time**

2 Assess clinical status using the ABCDE approach

- Check patient position
- If **respiratory distress** ➔ sit the patient **upright**
- If **hypotension** ➔ lie the patient **flat** *–and–* **elevate the legs**
- Check airway *–and–* give **oxygen**
- If airway involvement ➔ call **anaesthetics/ICU**

3 Treat anaphylaxis

- Give **adrenaline** *–and–* repeat at **5 minute intervals** if no improvement
- Give a **rapid bolus of IV crystalloid**
- Check for and remove any suspected **causative agent(s)**

4 Check the patient's response

- If no improvement after two doses of IM adrenaline state '**refractory anaphylaxis'** *–then–* go to **REFRACTORY ANAPHYLAXIS 3-2b**

5 Take mast-cell tryptase sample

- **5-10 mL clotted blood** drawn as soon as feasible following initial resuscitation

6 Consider transfer of patient to critical care setting

- Start **post-event** actions

DRUG DOSES and treatments

Adrenaline bolus*	**500 micrograms IM** to anterolateral aspect of mid-thigh *–or–* [specialist use] **50 micrograms IO/IV**
Oxygen	**15 L min^{-1}** via **reservoir mask** *–then–* **titrate** to SpO_2 94-98%

IM generally preferred; IV/IO adrenaline* ***ONLY* *to be given by experienced specialists*

Critical CHANGES

- If VF or pulseless VT ➲ **SHOCKABLE CARDIAC ARREST 1-2**
- If PEA or asystole ➲ **NON-SHOCKABLE CARDIAC ARREST 1-3**
- If refractory anaphylaxis ➲ **REFRACTORY ANAPHYLAXIS 3-9**

During RESUSCITATION

- Remove the potential causative agent where possible
- Give rapid bolus of IV fluids

Common CAUSATIVE AGENTS

- Antibiotics
- Anaesthetic drugs; neuromuscular blocking drugs
- Chlorhexidine
- Contrast media
- Nuts, insect stings, foodstuffs

POST-EVENT actions

- Take second tryptase sample at 1-2 hours, and third after 24 hours
- Consider cetirizine for cutaneous symptoms
- Make referral to a specialist allergy or immunology centre to identify the causative agent (see www.bsaci.org for details)
- Report anaphylactic drug reactions to the MHRA using the yellow card scheme (www.mhra.gov.uk)
- Inform the patient and their GP