Refractory anaphylaxis

No improvement in respiratory or cardiovascular symptoms despite 2 appropriate doses of intramuscular adrenaline

Establish dedicated peripheral IV or IO access

Seek expert[1] help early
Critical care support is essential

Give rapid IV fluid bolus
e.g. 0.9% sodium chloride

&

Start adrenaline infusion
Adrenaline is essential for treating all aspects of anaphylaxis

Give IM* adrenaline every 5 minutes until adrenaline infusion has been started

*IV boluses of adrenaline are not recommended, but may be appropriate in some specialist settings (e.g. peri-operative) while an infusion is set up

Give high flow oxygen
Titrate to SpO_2 94–98%

Monitor HR, BP, pulse oximetry and ECG for cardiac arrhythmia

Take blood sample for mast cell tryptase

Follow local protocol
OR

Peripheral low-dose IV adrenaline infusion:
- 1 mg (1 mL of 1 mg/mL [1:1000]) adrenaline in 100 mL of 0.9% sodium chloride
- Prime and connect with an infusion pump via a dedicated line

DO NOT 'piggy back' on to another infusion line

DO NOT infuse on the same side as a BP cuff as this will interfere with the infusion and risk extravasation

- In both adults and children, start at 0.5–1.0 mL/kg/hour, and **titrate according to clinical response**
- Continuous monitoring and observation is mandatory
- ↑↑BP is likely to indicate adrenaline overdose

Continue adrenaline infusion and treat ABC symptoms

Titrate according to clinical response

A = Airway

Partial upper airway obstruction/stridor:
Obstruction may occur rapidly.
Consider early tracheal intubation
Nebulised adrenaline (5mL of 1mg/mL)

Total upper airway obstruction:
Expert help needed, surgical airway may be required if tracheal intubation is not possible.

B = Breathing

Severe/persistent bronchospasm:
- Nebulised salbutamol and ipratropium with oxygen
- Follow management of life-threatening asthma which may include: IV salbutamol, aminophylline, magnesium, ketamine, inhalational anaesthetic and non-invasive ventilation.

Unconscious or ineffective breathing – oxygenation is critical:
- Bag mask ventilation
- Early tracheal intubation and anticipate difficult ventilation from high airway resistance

C = Circulation

Give further fluid boluses and titrate to response:
Child 10 mL/kg per bolus
Adult 500–1000 mL per bolus
- Use glucose-free crystalloid (e.g. Hartmann's Solution, Plasma-Lyte®)

Large volumes may be required (e.g. 3–5 L in adults)

Place arterial cannula for continuous BP monitoring

Establish central venous access

IF REFRACTORY TO ADRENALINE INFUSION
Consider adding a second vasopressor in addition to adrenaline infusion:
- Noradrenaline, vasopressin or metaraminol
- In patients on beta-blockers, consider glucagon

Consider extracorporeal life support

Cardiac arrest – follow ALS ALGORITHM
- Start chest compressions and intubate early
- Use IV or IO adrenaline bolus (cardiac arrest protocol)
- Aggressive fluid resuscitation
- Consider prolonged resuscitation /extracorporeal CPR

[1]Intravenous adrenaline for anaphylaxis to be given only by experienced specialists in an appropriate setting.

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