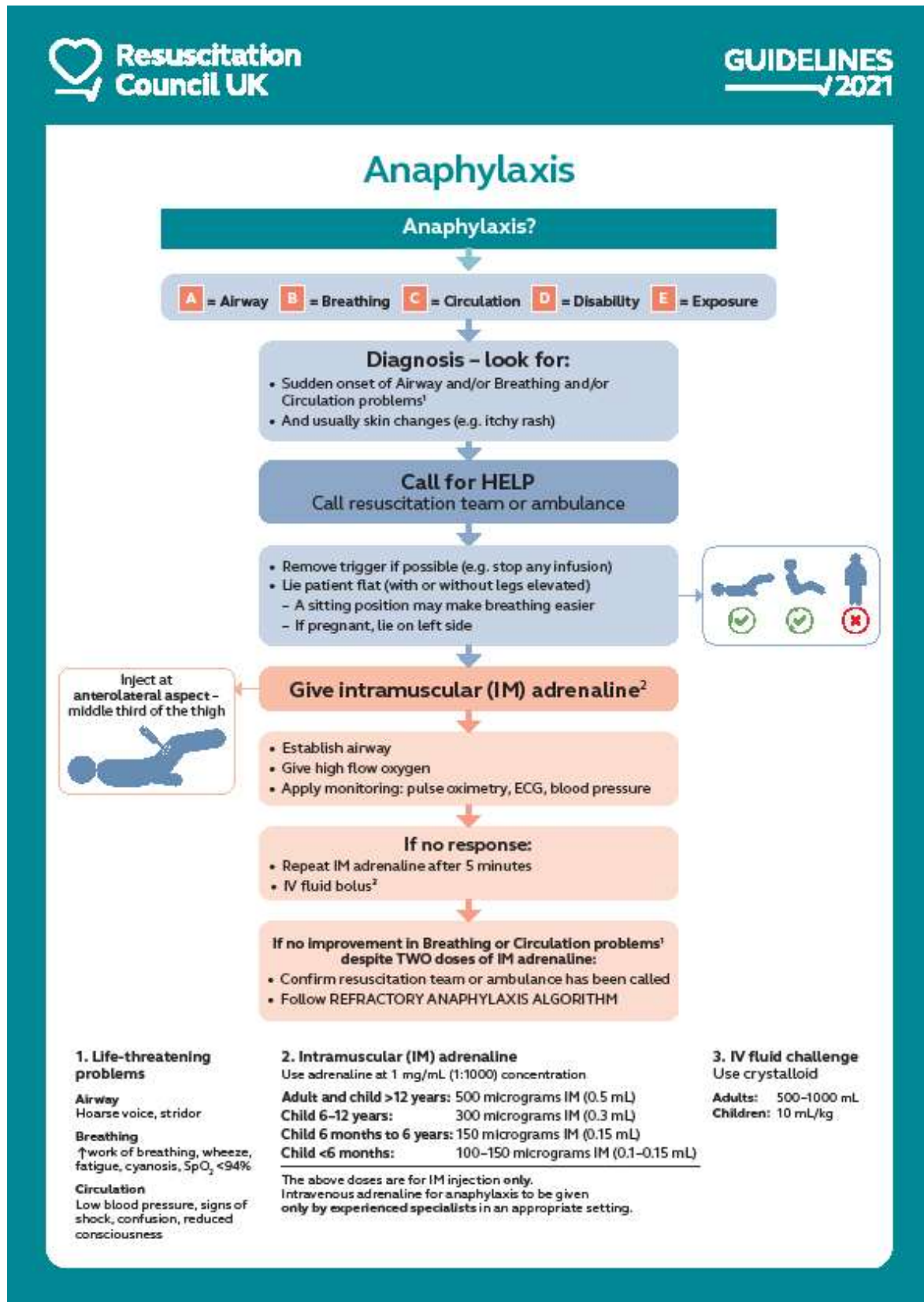
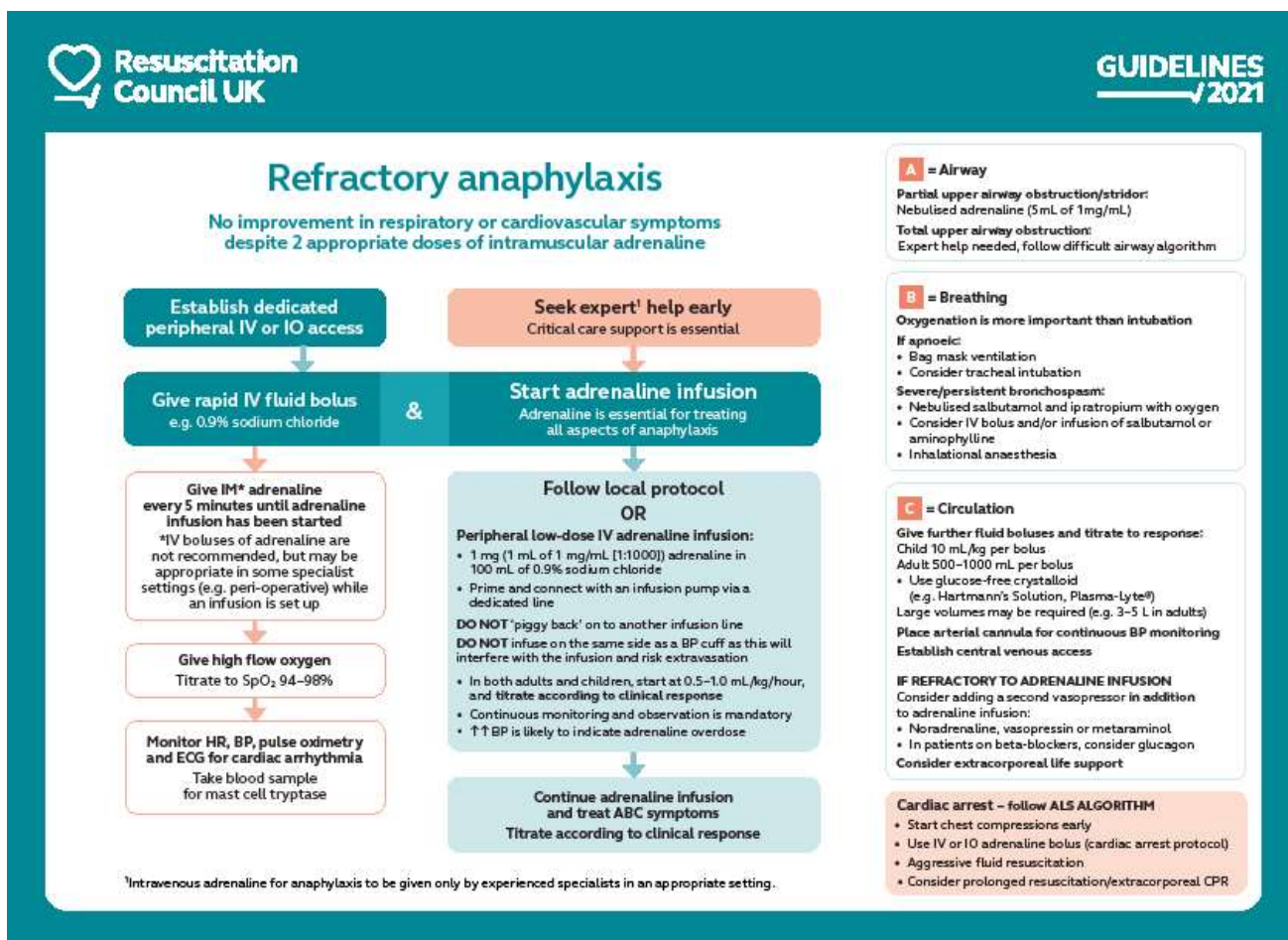


ANAPHYLAXIS

(This protocol should be used in conjunction with the mandatory annual basic life support training that all staff must attend)





Anaphylaxis is a potentially life-threatening allergic reaction.

Patients having an anaphylactic reaction in any setting should expect the following as a minimum:

- Recognition that they are seriously unwell.
- An early call for help.
- Initial assessment and treatments based on an ABCDE approach.
- Adrenaline therapy if indicated.

Definition

A precise definition of anaphylaxis is not important for the emergency treatment of an anaphylactic reaction, but in broad terms:

Anaphylaxis is a 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.

Triggers

Anaphylaxis can be triggered by any of a very broad range of triggers, but those most commonly identified include food, drugs and venom. Of foods, nuts are the most common cause; muscle relaxants, antibiotics, NSAIDs and aspirin are the most commonly implicated drugs. It is important to note that, in many cases, no cause can be identified. A significant number of cases of anaphylaxis are idiopathic (non-IgE mediated).

A diagnosis of anaphylactic reaction is likely if a patient who is exposed to a trigger (allergen) develops a sudden illness (usually within minutes of exposure) with rapidly progressing skin changes and life-threatening airway and/or breathing and/or circulation problems. The reaction is usually unexpected.

Diagnosis

The lack of any consistent clinical manifestation and a range of possible presentations cause diagnostic difficulty. There is a range of signs and symptoms, none of which are entirely specific for an anaphylactic reaction; however, certain combinations of signs make the diagnosis of an anaphylactic reaction more likely. When recognising and treating any acutely ill patient, a rational ABCDE approach must be followed and life-threatening problems treated as they are recognised.

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

- Sudden onset and rapid progression of symptoms
- Life-threatening **A**irway and/or **B**reathing and/or **C**irculation problems
- Skin and/or mucosal changes (flushing, urticaria, angioedema) – but these may be absent in up to 20% of cases.

The diagnosis is supported if the patient has been exposed to an allergen known to affect them.

But remember:

- 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
- There may also be gastrointestinal symptoms

Progression of symptoms

- The patient will feel and look unwell.
- Most reactions occur over several minutes.
- 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”.

ABCDE Assessment

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.
- Patient becoming tired.
- Confusion caused by hypoxia.
- 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.
- Bradycardia (a slow pulse) is usually a late feature, often preceding cardiac arrest.
- Cardiac arrest.

Disability problems:

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

Exposure:

Skin and/or mucosal changes should be assessed.

- They are often the first feature and present in over 80% of anaphylactic reactions.
- They can be subtle or dramatic.
- There may be just skin, just mucosal, or both skin and mucosal changes.
- 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.

Differential diagnoses

Life-threatening conditions:

- Sometimes an anaphylactic reaction can present with symptoms and signs that are very similar to life-threatening asthma – this is commonest in children.
- A low blood pressure (or normal in children) with a petechial or purpuric rash can be a sign of septic shock.
- Seek help early if there are any doubts about the diagnosis and treatment.
- Following an ABCDE approach will help with treating the differential diagnoses.

Non life-threatening conditions:

- Faint (vasovagal episode).
- Panic attack.
- Breath-holding episode in child.
- Idiopathic (non-allergic) urticaria or angioedema.

There can be confusion between an anaphylactic reaction and a panic attack. Patients with a history of anaphylaxis may be particularly prone to panic attacks if they think they have been re-exposed to the allergen that caused a previous problem.

The sense of impending doom and breathlessness leading to hyperventilation are symptoms that resemble anaphylaxis in some ways. While there is no hypotension, pallor, wheeze, or urticarial rash or swelling, there may sometimes be flushing or blotchy skin associated with anxiety adding to the diagnostic difficulty.

Diagnostic difficulty may also occur with vasovagal attacks after procedures, but the absence of rash, breathing difficulties, and swelling are useful distinguishing features, as is the slow pulse of a vasovagal attack compared with the rapid pulse of a severe anaphylactic episode.

Fainting will usually respond to lying the patient down and raising the legs.

Management

Early call for help

- i.e. phone 999 and ask for ambulance and tell the operator that you are dealing with a life threatening anaphylactic reaction

Patient positioning

- Patients with Airway and Breathing problems may prefer to sit up as this will make breathing easier.
- Lying flat with or without leg elevation is helpful for patients with a low blood pressure (Circulation problem).
- If the patient feels faint, do not sit or stand them up - this can cause cardiac arrest.
- Patients who are breathing and unconscious should be placed on their side (recovery position).
- Pregnant patients should lie on their left side to prevent caval compression.

Remove the trigger if possible

- Stop any drug suspected of causing an anaphylactic reaction.
- Remove the stinger after a bee sting. Early removal is more important than the method of removal.
- After food-induced anaphylaxis, attempts to make the patient vomit are not recommended.
- Do not delay definitive treatment if removing the trigger is not feasible.

Adrenaline***(no prescription is necessary in the event of an emergency)***

- Adrenaline is the most important drug for the treatment of an anaphylactic reaction.
- Adrenaline seems to work best when given early after the onset of the reaction
- Adverse effects are extremely rare with correct doses injected intramuscularly
- Adrenaline should be given to all patients with life-threatening features.
- Monitor the patient as soon as possible (pulse, blood pressure, pulse oximetry). This will help monitor the response to adrenaline.
- The IM route has several benefits:
 - There is a greater margin of safety.
 - It does not require intravenous access.
- The best site for IM injection is the anterolateral aspect of the middle third of the thigh. The needle used for injection needs to be sufficiently long to ensure that the adrenaline is injected into muscle.
- **Adrenaline IM dose**
 - **Adults** 0.5 mg IM (= 500 micrograms = 0.5 mL of 1:1000) adrenaline
 - **Children**
 - >12 years: 500 micrograms IM (0.5 mL) i.e. same as adults
 - 6 – 12 years: 300 micrograms IM (0.3 mL)
 - 6 months – 6 years: 150 micrograms IM (0.15 mL)
 - < 6 months: 150 micrograms IM (0.15 mL)
- Repeat the IM adrenaline dose if there is no improvement in the patient's condition.
- Further doses can be given at about 5-minute intervals according to the patient's response.

- Adrenaline auto-injectors
 - Auto-injectors are often given to patients at risk of anaphylaxis for their own use
 - They are a 300mcg dose, have a short shelf life and are very expensive.
 - If an adrenaline auto-injector is the only available adrenaline preparation when treating anaphylaxis, healthcare providers should use it.

Oxygen

- give as soon as available
- Initially, give the highest concentration of oxygen possible using a mask with an oxygen reservoir.
- Ensure high flow oxygen (usually greater than 10 litres min⁻¹) to prevent collapse of the reservoir during inspiration.

Intravenous Fluids

- Large volumes of fluid may leak from the patient's circulation during an anaphylactic reaction.
- There will also be vasodilation, a low blood pressure and signs of shock.
- If there is intravenous access, give an IV fluid bolus if Airway/Breathing/Circulation problems persist 5 minutes after first dose of IM adrenaline (as well as another dose of adrenaline).
- IV fluids are recommended for refractory anaphylaxis, and must be given early if hypotension or shock is present.
- Hartmann's solution or 0.9% saline are suitable fluids for initial resuscitation.

Follow on care

- Patients who have had a suspected anaphylactic reaction (i.e. an airway, breathing or circulation (ABC) problem) should be treated and then observed for at least 6 hours in a clinical area with facilities for treating life-threatening ABC problems (ie in secondary care)
- Patients with a good response to initial treatment should be warned of the possibility of an early recurrence of symptoms and in some circumstances should be kept under observation for up to 24 hours.

Reporting of reaction

- A datix form should be completed
- Adverse drug reactions that include an anaphylactic reaction should be reported to the Medicines and Healthcare products Regulatory Agency (MHRA) using the yellow card scheme (www.mhra.gov.uk). The British National Formulary (BNF) includes copies of the Yellow Card at the back of each edition

See additional Anaphylaxis PDF above for algorithms:

Reference

- Resuscitation Guidelines 2021. Resuscitation Council (UK)