Emergency treatment of anaphylactic reactions

Emergency treatment of anaphylactic reactions

Objectives - to understand:

- What is anaphylaxis?
- Who gets anaphylaxis?
- What causes anaphylaxis?
- How to recognise anaphylaxis
- How to treat anaphylaxis
- Follow up of the patient with anaphylaxis

What is anaphylaxis?

Anaphylaxis is:

- A severe, life-threatening, generalized or systemic hypersensitivity reaction

Anaphylaxis is characterised by:

- Rapidly developing, life threatening, Airway and/or Breathing and or Circulation problems
- Usually with skin and/or mucosal changes

Who gets anaphylaxis?

- Mainly children and young adults
- Commoner in females
- Incidence seems to be increasing

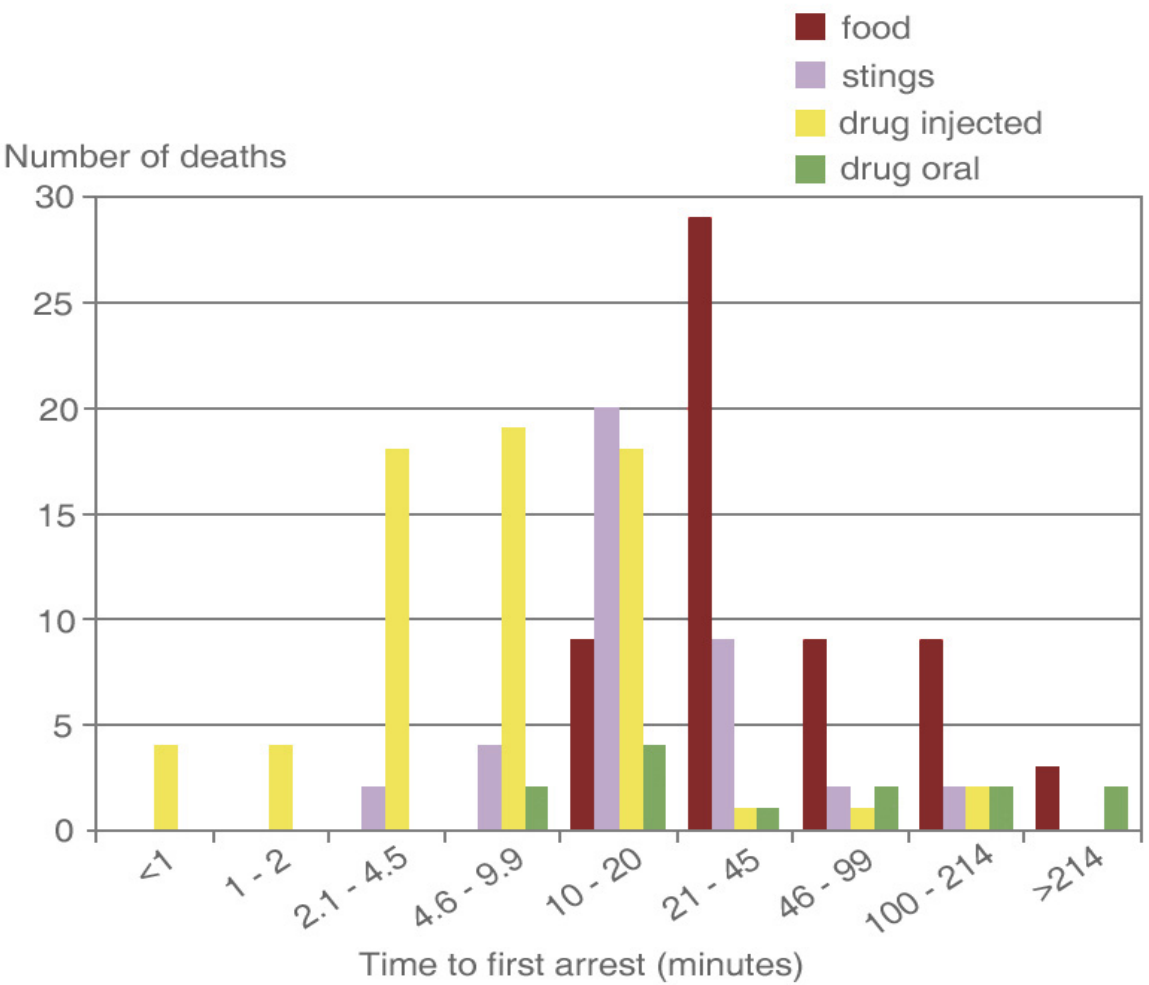
What causes anaphylaxis?

Stings	**47**	29 wasp, 4 bee, ? 14
Nuts	**32**	10 peanut, 6 walnut, 2 almond, 2 brazil, 1 hazel, 11 mixed or ?
Food	**13**	5 milk, 2 fish, 2 chickpea, 2 crustacean, 1 banana, 1 snail
? Food	**18**	5 during meal, 3 milk, 3 nut, 1 each - fish, yeast, sherbet, nectarine, grape, strawberry
Antibiotics	**27**	11 penicillin, 12 cephalosporin, 2 amphotericin, 1 ciprofloxacin, 1 vancomycin
Anaesthetic drugs	**35**	19 suxamethonium, 7 vecuronium, 6 atracurium, 7 at induction
Other drugs	**15**	6 NSAID, 3 ACEI, 5 gelatins, 2 protamine, 2 vitamin K, 1 each - etoposide, diamox, pethidine, local anaesthetic, diamorphine, streptokinase
Contrast media	**11**	9 iodinated, 1 technetium, 1 fluorescine
Other	**4**	1 latex, 1 hair dye, 1 hydatid,1 idiopathic

Suspected triggers for fatal anaphylactic reactions in the UK between 1992-2001

Adapted from Pumphrey RS. Fatal anaphylaxis in the UK, 1992-2001.
Novartis Found Symp 2004;257:116-28

Time to cardiac arrest



Adapted from Pumphrey RS. Lessons for management of anaphylaxis from a study of fatal reactions. *Clin Exp Allergy* 2000;30(8):1144-50.

Recognition and treatment

- ABCDE approach
- Treat life threatening problems
- Assess effects of treatment
- Call for help early
- Diagnosis not always obvious

Anaphylactic reaction is highly likely when following 3 criteria are fulfilled:

- 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)

Known allergen/trigger

- Exposure to a known allergen / trigger for the patient helps support the diagnosis

Remember

- Skin or mucosal changes alone are not a sign of an anaphylactic reaction
- Skin or 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)

Airway problems

- Airway swelling e.g. throat and tongue swelling
- Difficulty in breathing and swallowing
- Sensation that throat is ‘closing up’
- Hoarse voice
- Stridor

Breathing problems

- Shortness of breath
- Increased respiratory rate
- Wheeze
- Patient becoming tired
- Confusion caused by hypoxia
- Cyanosis (appears blue) – a late sign
- Respiratory arrest

Circulation problems

- Signs of shock – pale, clammy
- Increased pulse rate (tachycardia)
- Low blood pressure (hypotension)
- Decreased conscious level
- Myocardial ischaemia / angina
- Cardiac arrest

DO NOT STAND PATIENT UP

Disability

- Sense of “impending doom”
- Anxiety, panic
- Decreased conscious level caused by airway, breathing or circulation problem

Exposure – look for skin changes …

- Skin changes often the first feature
- Present in over 80% of anaphylactic reactions
- Skin, mucosal, or both skin and mucosal changes

Exposure – look for skin changes

(continued)

- Erythema – a patchy, or generalised, red rash
- Urticaria (also called hives, nettle rash, weals or welts) anywhere on the body
- Angioedema - similar to urticaria but involves swelling of deeper tissues e.g. eyelids and lips, sometimes in the mouth and throat

Differential diagnosis

Life-threatening conditions:

- **Asthma** - can present with similar symptoms and signs to anaphylaxis, particularly in children

- **Septic shock** - hypotension with petechial/purpuric rash

Differential diagnosis

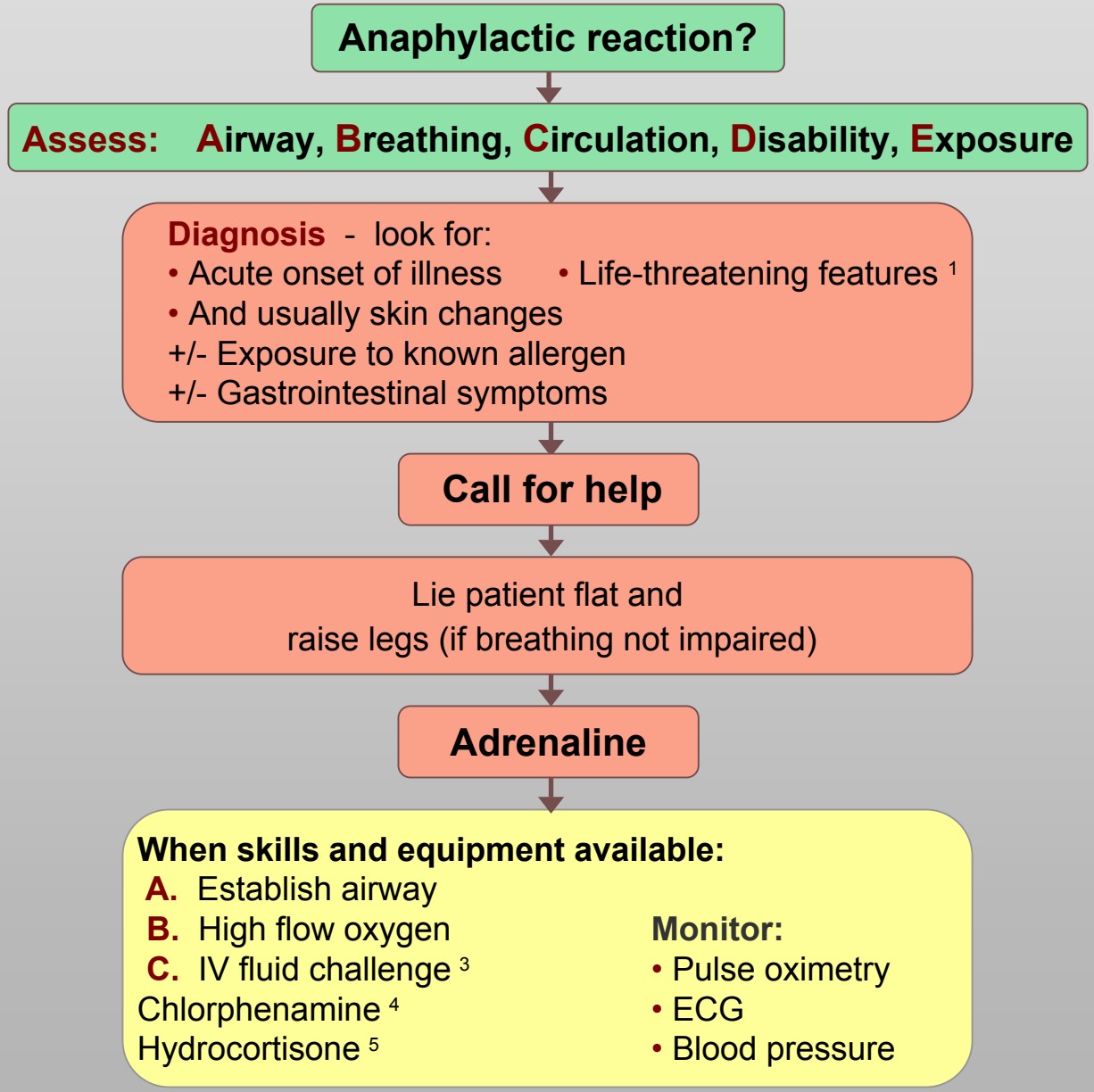
(continued)

Non-life-threatening conditions:

- Vasovagal episode
- Panic attack
- Breath-holding episode in a child
- Idiopathic (non-allergic) urticaria or angioedema

Seek help early if there are any doubts about the diagnosis

Treatment of anaphylactic reactions


Anaphylactic reaction?
Assess: Airway, Breathing, Circulation, Disability, Exposure
Diagnosis - look for:
• Acute onset of illness
• Life-threatening features [1]
• And usually skin changes
+/- Exposure to known allergen
+/- Gastrointestinal symptoms
Call for help
Lie patient flat and
raise legs (if breathing not impaired)
Adrenaline
When skills and equipment available:
A. Establish airway
B. High flow oxygen
C. IV fluid challenge [3]
Chlorphenamine [4]
Hydrocortisone [5]
Monitor:
• Pulse oximetry
• ECG
• Blood pressure

Intra-muscular adrenaline

Adrenaline

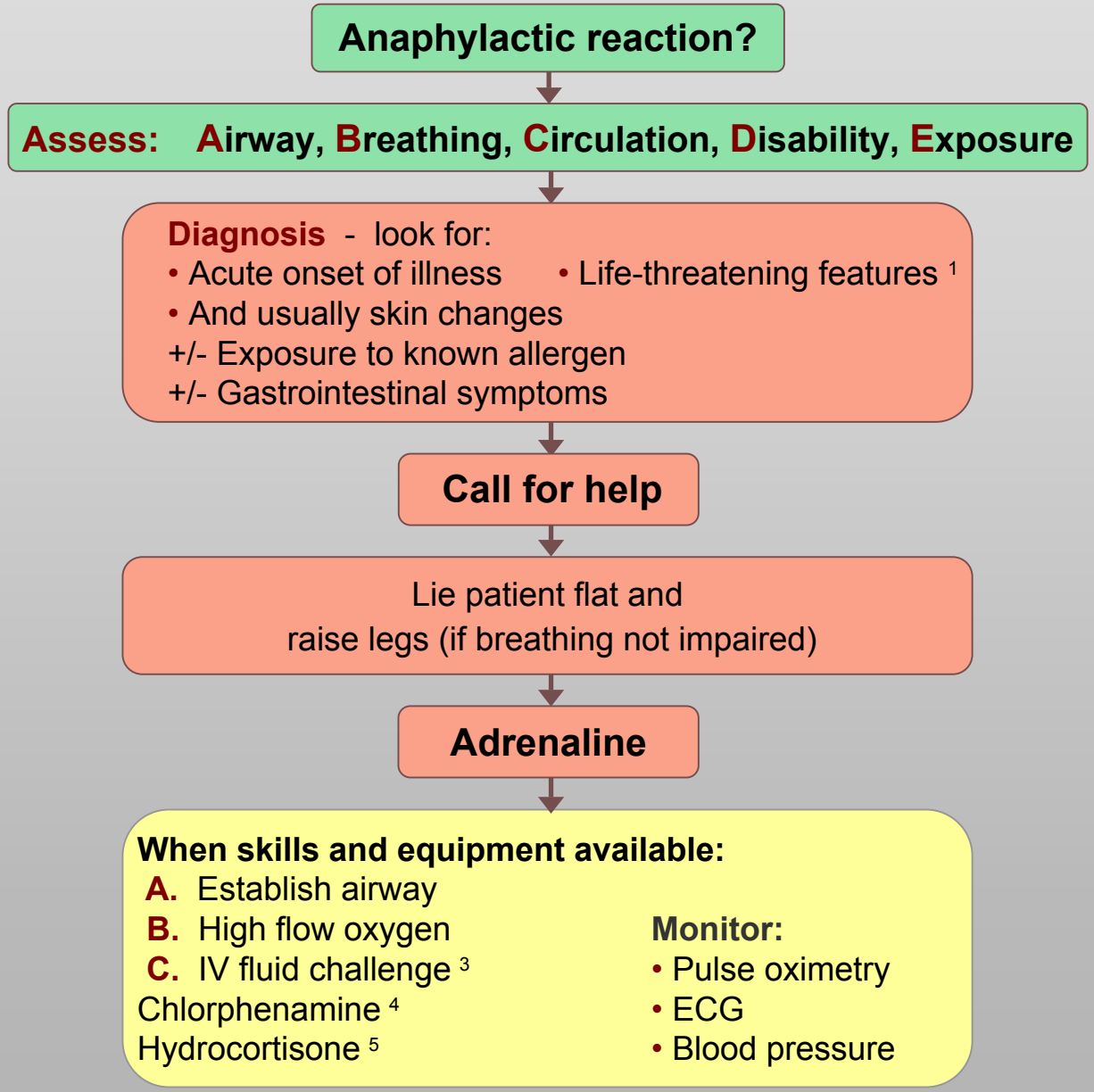
IM doses of 1:1000 adrenaline (repeat after 5 min if no better)

- Adult or child more than 12 years: 500 micrograms IM (0.5 mL)
- Child 6 -12 years: 300 micrograms IM (0.3 mL)
- Child 6 months - 6 years: 150 micrograms IM (0.15 mL)
- Child less than 6 months: 150 micrograms IM (0.15 mL)

Caution with intravenous adrenaline

For use by experts only

Monitored patient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Fluids

- Once IV access established
- 500 – 1000 mL IV bolus in adult
- 20 mL/Kg IV bolus in child
- Monitor response - give further bolus as necessary
- Colloid or crystalloid (0.9% sodium chloride or Hartmann's)
- Avoid colloid, if colloid thought to have caused reaction

Steroids and anti-histamines
(Hydrocortisone and chlorphenamine)

- Second line drugs
- Use after initial resuscitation started
- Do not delay initial ABC treatments
- Can wait until transfer to hospital

Cardiorespiratory arrest

- Follow Basic and Advanced Life Support guidelines
- Consider reversible causes
- Give intravenous fluids
- Need for prolonged resuscitation
- Good quality CPR important

Investigation: mast cell tryptase

Ideal sample timing:

1. After initial resuscitation started and feasible to do so
2. 1-2 hours after onset of symptoms
3. 24 hours or in convalescence or at follow up

Auto-injectors …

(e.g. Anapen, Epipen)

- For self-use by patients or carers
- Should be prescribed by allergy specialist
- For those with severe reactions and difficult to avoid trigger

Auto-injectors (continued)

(e.g. Anapen, Epipen)

- Train the patient and carers in using the device
- Practise regularly with a trainer device
- Rescuers should use these if only adrenaline available*

*see **www.anaphylaxis.org.uk** for videos on how to use auto-injectors*

Anaphylaxis

- Recognition and early treatment
- ABCDE approach
- Adrenaline
- Investigate
- Specialist follow up
- Education – avoid trigger
- Consider auto-injector

Further information on anaphylaxis is available at:

www.resus.org.uk

Resuscitation Council (UK)