


ThinkAskLearn
Health Professional Education

Anaphylaxis Anxiety
Calming the Nervous


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Could you do it?


- You are working in an isolated nursing post
- 200 kms from a rural hospital
- There is a volunteer ambulance service available in town (Not paramedic)
- No other clinical staff available
- A doctor is available by phone – GP from Hospital
- You are at home relaxing....



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Could you do it?

- You get a call at 2000hrs to attend severe respiratory distress
- You arrive in less than 5 mins
- On arrival
 - 20 year old girl
 - Severe respiratory distress
 - Audible wheeze and stridor
 - Pale,
 - Cyanotic



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Could you do it?

- Unable to speak – “unable to breathe”
- Restless, Agitated
- Tachycardic P 128
- O₂ Sats 80%, RR 36
- Boyfriend presents- states she Hx asthma and is allergic to peanuts,
- Just been to the local café for dessert – Sticky date pudding with pistachio nuts



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Could you do it?

- Oxygen provided
- Given neb – ventolin, atrovent and adrenaline
- Gives IM adrenaline 0.3mg, IM promethazine
- First 5-10 minutes little change
- Then pt deteriorates Sats 90% down to 45%
- 2040hrs - Calls GP from Hospital (200kms away)
- Recommends continue nebs, get IV access and administer hydrocortisone



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Could you do it?

- 20:55hrs – Sats 65%, Increase in stridor, Bradycardia, worsening distress
- Advised to give 2nd dose of adrenaline - 1mg
- Slight improvement
 - Able to gain access
 - Gave hydrocortisone
- 21:25 – Deteriorates again
 - Sats 75%, HR 45
- Advised 1mg IV Adrenaline – Same given



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Could you do it?

- No real improvement
- Dr advises - Attempt to perform surgical airway
- 4 attempts are made
- 5th attempt with biro
- Patient unable to be resuscitated further
- Resuscitation ceased at 21:50



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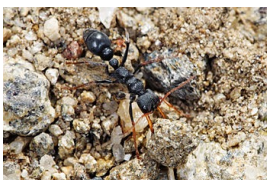
What did we learn?

- Most health care professionals under prepared for situations
- Avoidance (Scared) of adrenaline use in anaphylaxis
- Increase education to patients with anaphylaxis when presenting to ED's
- Encourage use of Epi Pen by patients with previous anaphylactic reactions ('too bulky')



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Which kills more people?



McGain & Winkel, Toxicon, 2002

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How common is Anaphylaxis?

- 'Uncommon but not rare'
- 8.4- 21 per 100 000 patient years
- High as 1 in 50 in specific areas
- 1 in 170 school children (self report)
- Death 1 per 3 million people per year
- In ED, 1 death in 200-300 patients treated with anaphylaxis

Brown et al, MJA 2018



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What Causes Anaphylaxis?

- Insect stings: most commonly honeybee, Australian native ants, wasps
- Foods: most commonly peanuts, tree nuts, egg, seafood, cows milk, dairy products, seeds
- Medications: most commonly antibiotics, non-steroidal anti-inflammatory drugs
- Unidentified (no cause found)



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Less common but still real

- Physical triggers (eg, exercise, cold)
- Biological fluids (eg, transfusions, immunoglobulin, antivenoms, semen)
- Latex
- Tick bites
- Hormonal changes: breastfeeding, menstrual factors
- Dialysis membranes (haemodialysis- associated anaphylaxis)
- Hydatid cyst rupture
- Aeroallergens: domestic/laboratory animals, pollen
- Food additives: monosodium glutamate, metabisulfite, preservatives, colours, natural food chemicals
- Topical medications (eg, antiseptics)



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Pathophysiology of Anaphylaxis

- Allergen sensitisation – Allergy antibody (IgE) produced
- IgE attaches to Mast cells in skin, GI tract, resp system and peripheral blood basophils
- Subsequent exposure – Rapid mast cell activation
- Histamine release and other inflammatory mediators released
- Causes increased vascular permeability, smooth muscle spasm, mucosal oedema and inflammation



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Defining Anaphylaxis

- Any **acute onset illness** with **typical skin features** (urticarial rash or erythema/flushing, and/or angioedema), **PLUS** involvement of **respiratory** and/or **cardiovascular** and/or persistent severe **gastrointestinal** symptoms. OR
- Any **acute onset** of **hypotension** or **bronchospasm** or **upper airway obstruction** where anaphylaxis is considered possible, even if typical skin features are not present.

ASCIA 2024



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Signs and Symptoms

- **Mild or moderate allergic reactions**
- Swelling of lips, face, eyes
- Hives or welts
- Tingling mouth
- Abdominal pain, vomiting (these are signs of a severe allergic reaction to insects)



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Urticarial Rash



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Urticarial Rash



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Urticarial Rash



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Peanut urticarial rash



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Severe Allergic Reaction



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Ace inhibitor Allergic Reaction



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More Significant Signs

- Watch for any one of the following signs of anaphylaxis:
- Difficult/noisy breathing
- Swelling of tongue
- Swelling/tightness in throat
- Difficulty talking and/or hoarse voice
- Wheeze or persistent cough
- Persistent dizziness or collapse
- Pale and floppy (young children)



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Severe Hypotension



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Severe Hypotension



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Anaphylaxis and Death

- Linked to poorly controlled asthma who delay treatment of adrenaline
- Death occurs within 30 mins of food based trigger
- Insect stings within 10-15 mins
- Drug interaction with 5 mins
- No deaths occur after 6 hrs of contact with trigger

Nolan et al, ERC 2020



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Treatment

- ABCDE approach for all
- Principles of management are essentially the same for all age groups
- All patients should be monitored in a high care environment
- Min monitoring includes:
 - NIBP, SpO₂, 3 lead ECG,



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First line Treatment

- Patient positioning
 - Avoid standing if possible
 - Airway problems may prefer to sit up
 - Lying flat may improve circulation
 - Raised legs **** STOP!!!!



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First Line Treatment

- Remove the trigger
 - Stop the medication/bloods
 - Remove the bee sting



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First Line Treatment

- If in cardiac arrest
 - Start CPR
 - Usual protocol
- Airway obstruction
 - BVM with Hi Flow oxygen
 - Give adrenaline!!!!
 - Cricothyroidotomy
 - Call for help early



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First Line Treatment

- Adrenaline
 - No randomised controlled trials
 - Consistent anecdotal evidence / End of needle effect
- Alpha-receptor agonist,
 - Peripheral vasoconstriction
 - Reduces oedema.
- Beta-receptor activity
 - dilates the bronchial airways
 - increases the force of myocardial contraction
 - suppresses histamine and leukotriene release
- Beta-2 adrenergic receptors on mast cells
 - that inhibit activation and attenuates the severity of IgE-mediated allergic reactions



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First Line Treatment

- Adrenaline seems to work best when given early after the onset of the reaction
- But it is not without risk, particularly when given intravenously.
- Adverse effects are extremely rare with correct doses injected intramuscularly (IM)



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First Line Treatment

- Intramuscular Adrenaline
 - There is a greater margin of safety
 - It does not require intravenous access
 - The IM route is easier to learn
- Use anterolateral thigh muscle



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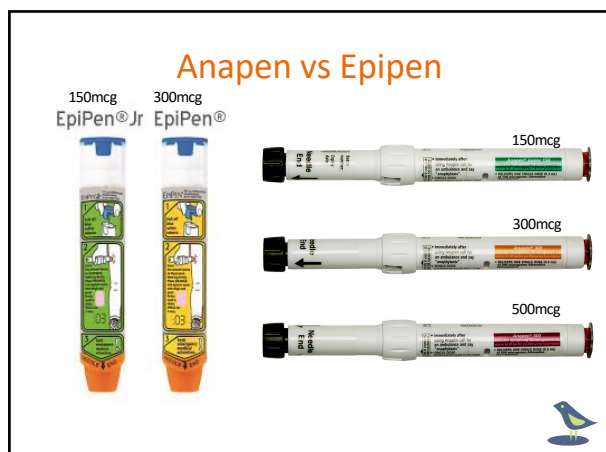
First Line Treatment

- 10mcg/kg up to 500mcg of 1:1000
- 1 EpiPen or 1 AnaPen

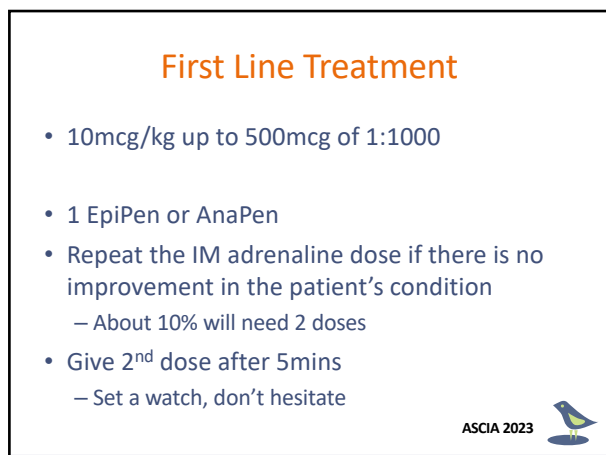
Nolan et al, ERC 2010 ASCIA 2023



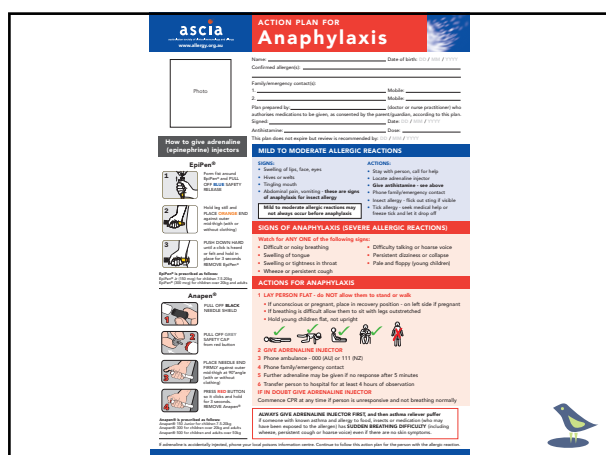
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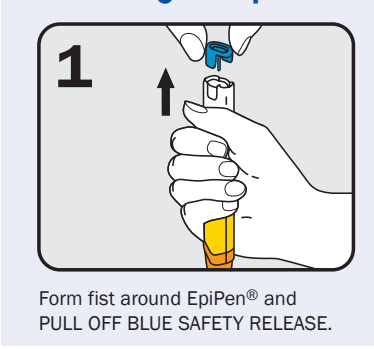
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1

Form fist around EpiPen® and
PULL OFF BLUE SAFETY RELEASE.

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2

PLACE ORANGE END against outer
mid-thigh (with or without clothing).

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3

3. PUSH DOWN HARD until
a click is heard or felt and
hold for 3 seconds
REMOVE EpiPen®

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Problems with Autoinjectors

- Lack of use of epinephrine auto-injectors (common)
- Not available for purchase in many countries
- Not prescribed by physician
- Not affordable
- Prescription not filled or picked up
- Not accessible when anaphylaxis occurred
- Not used because:
 - Patient used another medication, e.g. H₁-antihistamine or asthma puffer^a
 - Reaction seemed to be mild
 - Reaction seemed to improve quickly
 - Patient was unsure when to inject
 - Patient was afraid to inject
 - Epinephrine was past expiry date
 - Previous systemic allergic reaction improved quickly
- Apparent lack of response to epinephrine (uncommon)
- Rapid progression of anaphylaxis
- Empty ventricle syndrome
- Patient taking another medication that interfered with epinephrine effect
- Epinephrine injected too late
- Epinephrine dose too low
 - On a mg/kg basis for body weight of patient
- Due to auto-injector being past the expiry date
- Delayed absorption
- Route of injection not optimal
- Site of injection not optimal
- Epinephrine injected using incorrect technique, e.g. not enough force
- Adverse reaction to sodium metabisulfite preservative in the epinephrine solution (rare)

Simmons et al 2010



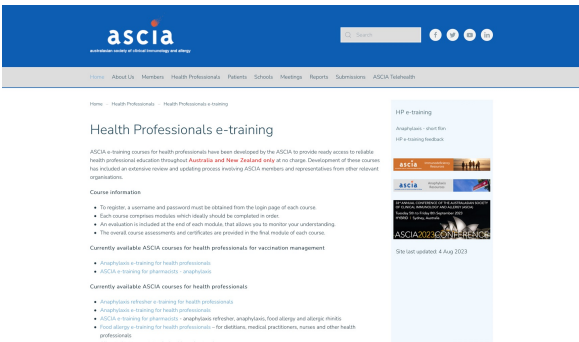
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Oops!!




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More info – Free E-learning




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Journal of Allergy and Clinical Immunology:
Global



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Original article

National best practice guidelines for
anaphylaxis prevention and management in
Australian schools


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ASCIA – Free E-learning





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