Generated by Foxit PDF Creator © Foxit Software
http://www.foxitsoftware.com For evaluation only.

Anaphylaxis

Thisanayagam Umasunthar

Objectives

- Define anaphylaxis
- Pathophysiology
- Epidemiology
- Management

Objectives

- **Define anaphylaxis**
- Pathophysiology
- Epidemiology
- Management

What is anaphylaxis

- A severe systemic allergic reaction
- Extreme end of the allergic spectrum
- The whole body is usually affected with in minutes
- It can take seconds to hours to develop after the exposure to the allergen

Anaphylaxis - Definitions

- First documented case pharaoh Menes
  - Died 2640 BC after a wasp sting
- Described by Richet 1901 'aphylaxis'
  - Lack of protection
- Definitions vary
- Best defined as 'acute life-threatening generalized or systemic hypersensitivity reaction'

Anaphylaxis Diagnostic Criteria

1) acute onset with mucosal and skin involvement AND one of the following:
- Respiratory compromise
- Reduced BP or associated symptoms

2) Two or more of the following:
- Skin-mucosal involvement
- Respiratory
- Reduced BP
- Persistent GI symptoms

3) Low BP after allergen exposure
- Children: > 30% decrease
- Adults: systolic <90mmhg or greater than 30% reduction

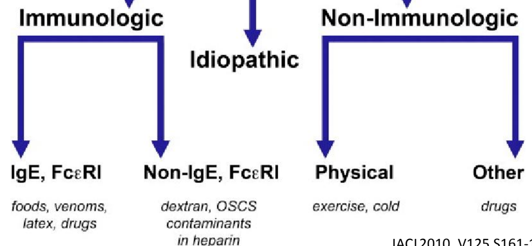
J Allergy Clin Immunol **117(2): 391-397.**

Generated by Foxit PDF Creator © Foxit Software
http://www.foxitsoftware.com For evaluation only.

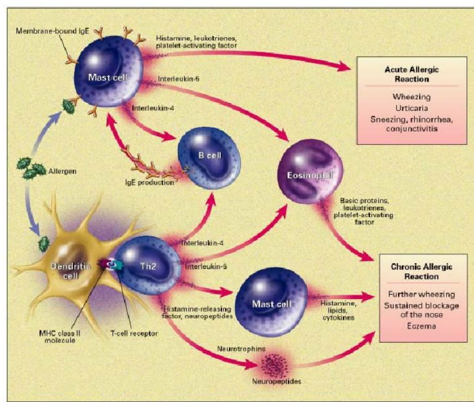
Objectives

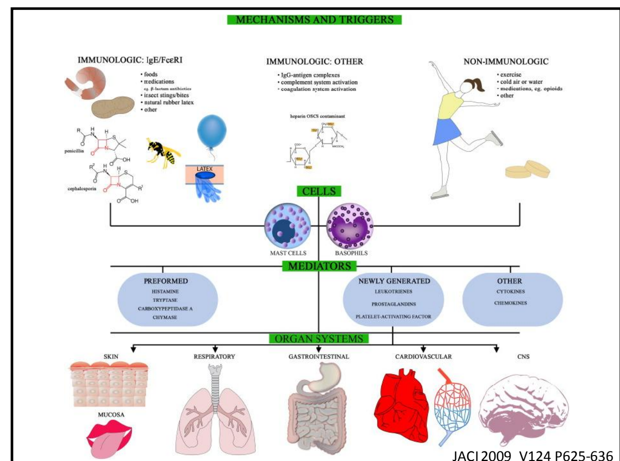
- Define anaphylaxis
- **Pathophysiology**
- Epidemiology
- Management

Human Anaphylaxis



JACI 2010 V125 S161-181





JACI 2009 V124 P625-636

Physiological effects

- Respiratory: Bronchospasm Wheeze, stridor, SOB
- CVS: capillary leak hypotension, reduced cardiac out put PEA
- Mucosal surfaces: Tongue swelling, eyelid lip swelling,, urticaria, angioedema
- GI: Abdominal pain vomiting, diarrhoea
- Other: confusion, other smooth muscle contractions eg uterine contraction etc

Triggers

- Food triggers : peanut, tree nuts shell fish, fish, milk, egg, sesame but geographical variance
- Drugs(NSAIDS, ABX, Anaesthetic agents)
- Venom from stinging insects
- Contrast agents
- Immunotherapy
- Monoclonal antibodies
- Latex
- Inhalants
- Exercise and cold and hot weather
- Spices and colorants

Generated by Foxit PDF Creator © Foxit Software
http://www.foxitsoftware.com For evaluation only.

Objectives

- Define anaphylaxis
- Pathophysiology
- **Epidemiology**
- Management

Epidemiology

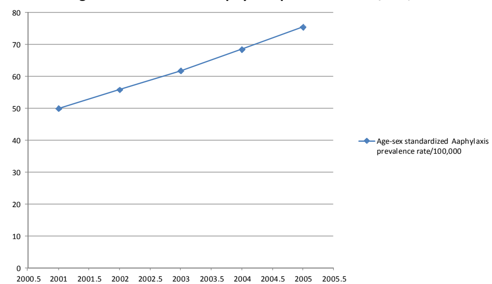
- Incidence
- Hospital admissions
- Fatalities

Incidence

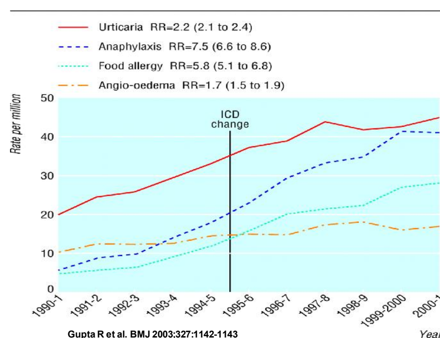
- Anaphylactic events are generally increasing
- Rochester study
  - Yocum 30/100 000 patient years (83-87)
  - Decker 50/100 000 patient years(1990-2000)
- Sheikh : 50/100 000 to 75.5 /100 000 from 2001-2005

JACI104(2): 452-456.
J Allergy Clin Immunol 122(6): 1161-1165
J R Soc Med 2008 1 101 (3) 139-143

Age-sex standardized Aaphylaxis prevalence rate/100,000

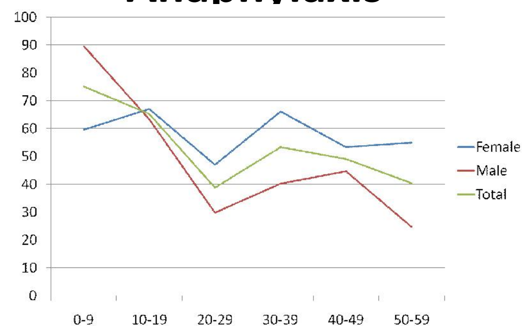


Trends in age and sex standardised admission rates for anaphylaxis, angio-oedema, food allergy, and urticaria, with rate ratios (RR) and 95% confidence intervals, England 1990-2001.



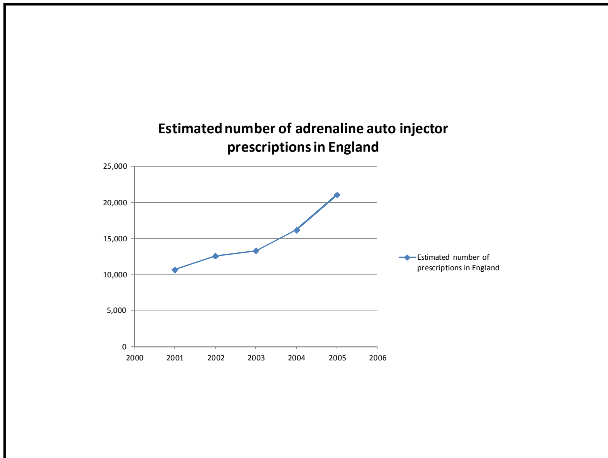
Gupta R et al. BMJ 2003;327:1142-1143

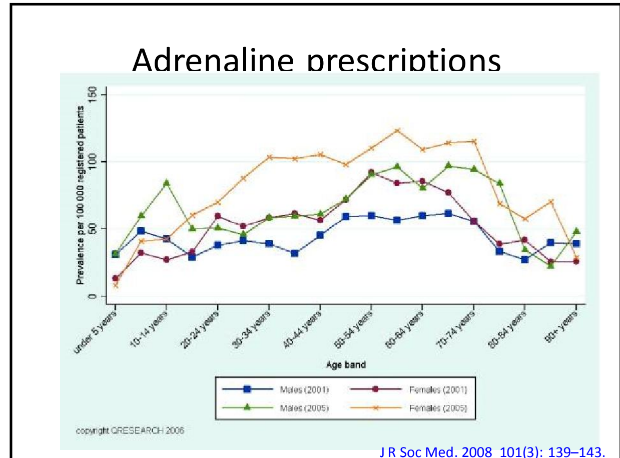
©2003 by British Medical Journal Publishing Group



J Allergy Clin Immunol 2008;122:116105
J Allergy Clin Immunol 2009;123:434-42

Generated by Foxit PDF Creator © Foxit Software
http://www.foxitsoftware.com For evaluation only.





J R Soc Med. 2008 101(3): 139–143.

Anaphylaxis mortality in UK

(See Pumphrey Clin. Exp Allergy 2000;30:1144-50)

- 1993 to 2004 about 10deaths per year from death certificates
- Fatal anaphylaxis register has identified double this number
- Causes of fatal anaphylaxis: medication 44%; food 30%; insects 26%
- Death occurred very quickly after contact (mostly within 35 minutes)

Time to death due to anaphylaxis

- IV drugs (anaesthetics, IV antibiotics)
- Insect stings
- Oral Medications
- Food

Degree of Trouble Experienced by Caregivers as a Result of a Child's Food Allergy During the Week Before Survey Administration

Item	Minimally %	Moderately %	Extremely %
Emotional burden			
Anxiety relating to child's food allergy	33.8	40.1	26.1
Concern child may not overcome food allergy	29.9	40.5	29.6
Sadness for child's burden	31.3	38.5	30.2
Frightened that child will have reaction	34.8	38.6	26.6

Annals of Allergy, Asthma & Immunology Volume 105, Issue 4, 2010, Pages 287-294.e3

Risk Analysis
Volume 31, Issue 1, pages 171-183

Generated by Foxit PDF Creator © Foxit Software
http://www.foxitsoftware.com For evaluation only.

Objectives

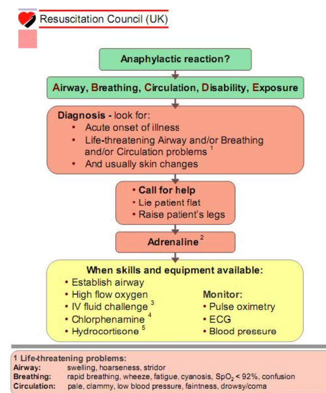
- Define anaphylaxis
- Patho physiology
- Epidemiology
- **Management**

Case History

- 15 year old man
- Known cashew nut allergy and asthma
- Gets a Chinese takeaway with friends
- Feels sick while eating, develops abdominal pain, feels faint
- Friends call an ambulance when unable to rouse him
- On arrival heart rate 100, BP 100/80, drowsy, wheeze throughout chest,
- SaO2 90% in air, urticarial rash over trunk

Management

- Acute
- Long term



Medications

2 Adrenaline *(give IM unless experienced with IV adrenaline)*
IM doses of 1:1000 adrenaline (repeat after 5 min if no better)

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

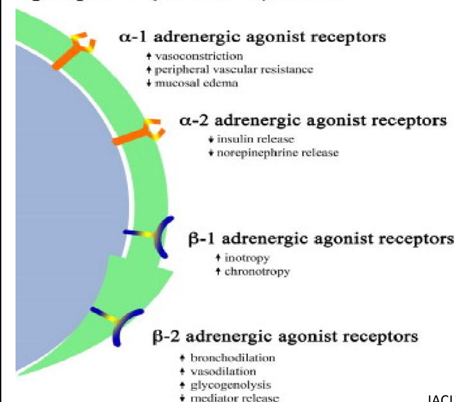
Adrenaline IV to be given **only by experienced specialists**
Titrate: Adults 50 micrograms; Children 1 microgram/kg

3 IV fluid challenge:
Adult - 500 – 1000 mL
Child - crystalloid 20 mL/kg

Stop IV colloid
if this might be the cause of anaphylaxis

	4 Chlorphenamine (IM or slow IV)	5 Hydrocortisone (IM or slow IV)
Adult or child more than 12 years	10 mg	200 mg
Child 6 - 12 years	5 mg	100 mg
Child 6 months to 6 years	2.5 mg	50 mg
Child less than 6 months	250 micrograms/kg	25 mg

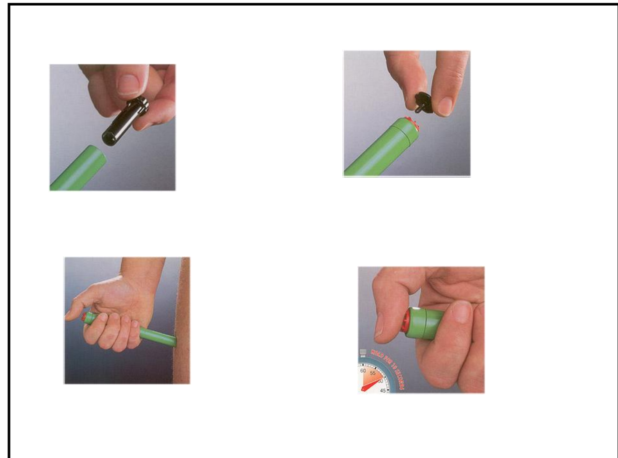
Figure 3. Anaphylaxis algorithm

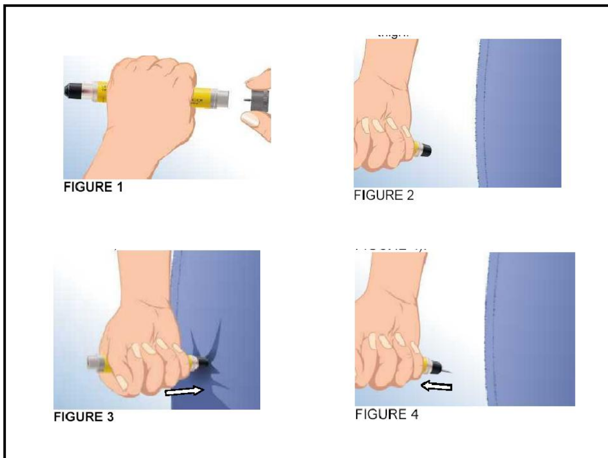


Generated by Foxit PDF Creator © Foxit Software
http://www.foxitsoftware.com For evaluation only.

Who Needs An Epipen?

- Previous anaphylaxis
- Nut allergy
- Asthma
- Adolescent/young adult
- Home/activities in remote area





MISTAKE NUMBER 1

The black tip contains the needle and needs to be placed against the mid-thigh.

Holding the wrong end and injecting the thumb (blue line) is painful and not ver[y] effective ...

Resources

- http://www.anaphylaxis.org.uk/
- http://www.anapen.co.uk/
- http://www.epipen.co.uk/
- http://www.jext.co.uk/

Rate of successful adrenaline injection in undergraduate medical students after a single training session

	Anapen (n=25)	Epipen (n=27)	P Value
Removal of Safety Cap(s)	20/25 (80%)	27/27 (100%)	0.02
Correct anatomical position	20/20 (100%)	27/27 (100%)	1.00
Use of correct end to inject	19/20 (95%)	22/27 (81%)	0.15
Successful activation of the Device	19/19 (100%)	20/22 (91%)	0.28
Held the device for > 5seconds	17/19 (89%)	17/20 (85%)	0.34
Successful administration of adrenaline	**17/25 (68%)**	**17/27 (63%)**	**0.70**
Mean Time to injection (SEM)	17.2s (1.4)	20.2s (2.0)	0.23

Generated by Foxit PDF Creator © Foxit Software
http://www.foxitsoftware.com For evaluation only.

Adrenaline Autoinjectors

- Only used by parents in 29% of recurrent anaphylaxis episodes [1]
- Only 63% of paediatricians effectively delivered adrenaline using a dummy Epipen [2]
- Needle length is an issue esp. in obese patients 12-30% of US children IM injection not achieved [3]

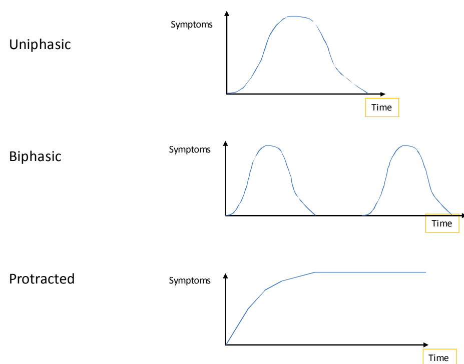
1 J Allergy Clin Immunol 2000;106:171-6
2 Ped Allergy Immunol 2007;18:448-452
3 Pediatrics 2009;124:65-70

Biphasic Anaphylaxis

- 102 cases of anaphylaxis presenting to a paed A&E
  - 11 biphasic reactions (11%)
- Risk of biphasic reaction increased if fluid resuscitation or multiple adrenaline doses needed
- Median time from anaphylactic to biphasic onset:
  - 6.5 hrs (IQR 1.5 – 16)

De Silva Allergy 2008;63:1071

Biphasic Anaphylaxis



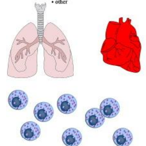
Masqueraders

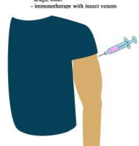
- Urticaria due to other causes such as excercise or cholinergic urticaria
- Angioedema
- Asthma, syncope, panic attack, seizure,
- OAS, scromboidosis, MSG
- Mastocytosis, basophilic leukaemia
- Flush syndromes: eg carcinoid,

MANAGEMENT OF COMORBIDITIES

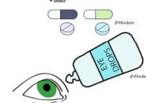
ALLERGEN AVOIDANCE

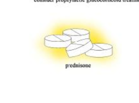
IMMUNOMODULATION





ASSESSMENT OF CONCURRENT MEDICATIONS





JACI 2009 V124 P625-636

Summary - Anaphylaxis

- Definition problematic – incidence underestimated
- May be increasing in incidence
- Fatal in 1/100-1/1000 cases
- Most common in first decade
- Fatalities most common in adolescents/young adults
- Triggers – food>stings>idiopathic>drugs
- Fatal anaphylaxis – drugs>food(esp. nuts)>stings
- Management is early adrenaline – IM
- Education/allergy diagnosis important for prevention