




# ANAPHYLACTIC SHOCK



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# Learning Outcomes

- Outline the pathophysiology
  - Describe the clinical presentation
  - Discuss the management of anaphylactic shock
- 




# Anaphylaxis

- Severe, life threatening, generalized or systemic hypersensitivity reaction characterized by rapidly developing, life threatening changes to the  
Airway +/- breathing +/- circulation
  - 1 in 1300 experience anaphylaxis during their lifetime (UK data)
  - Commoner in females
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# Clinical Scenario - 1

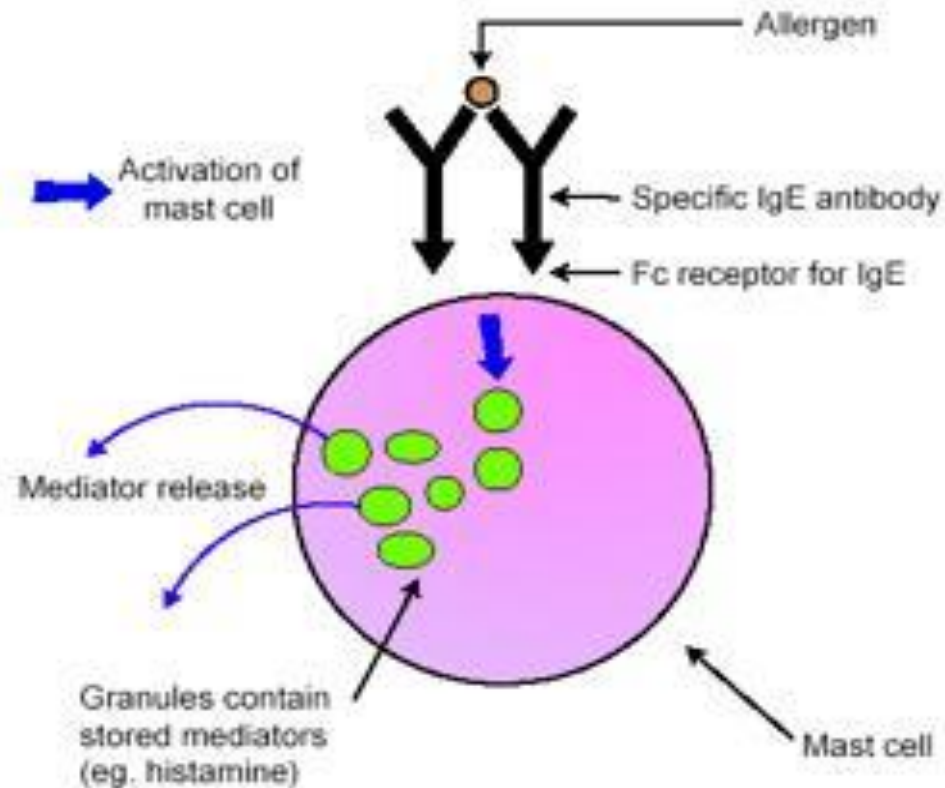
- 25 year old male, presented with features of cellulitis.
  - C/O difficulty in breathing, pruritus and faintishness soon after the first dose of iv Benzyl penicillin.
  - Heart rate 120/min, blood pressure 70/40mmHg
  - What is the most likely diagnosis?
  - What would you do if you are the House officer?
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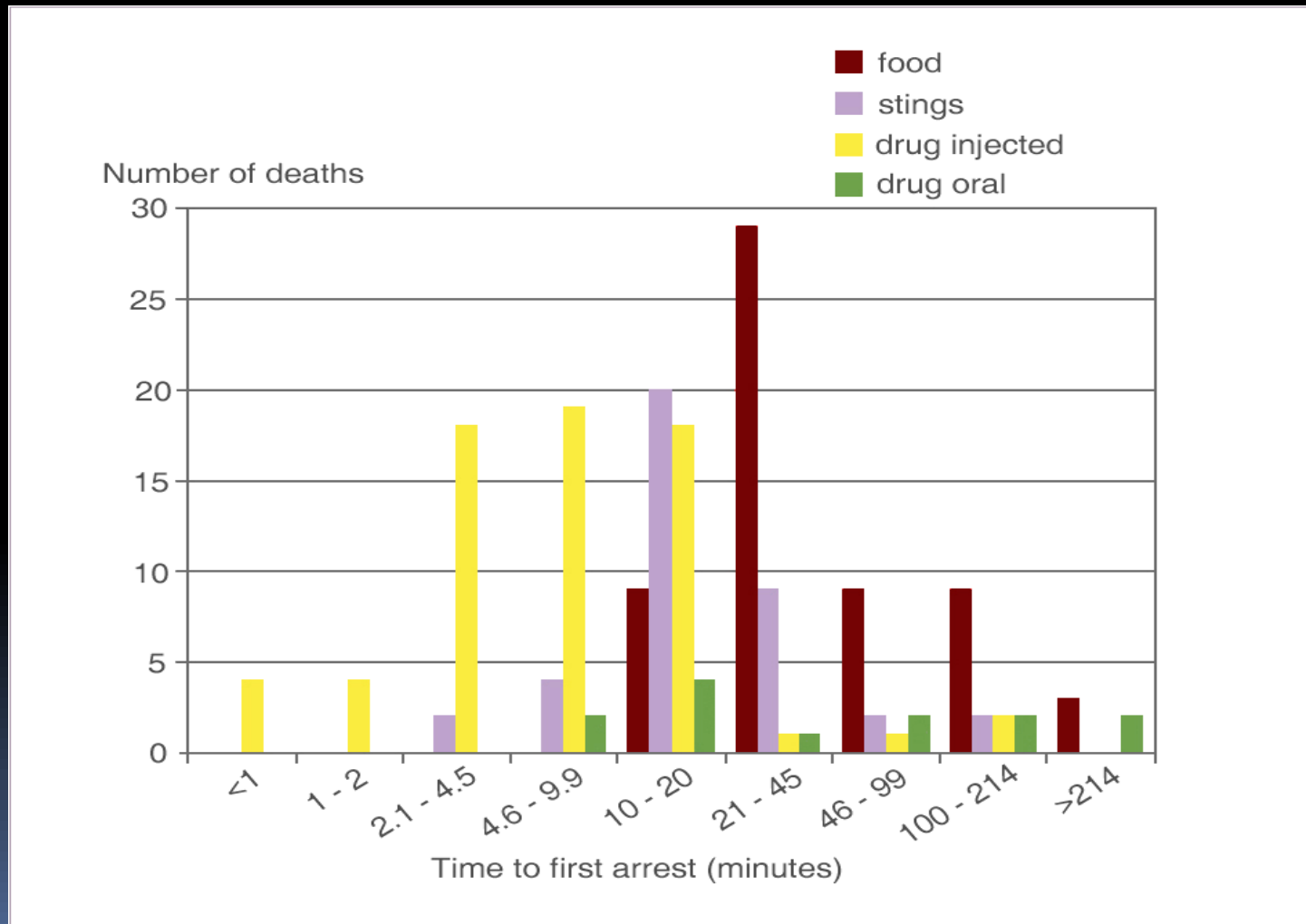
# Pathophysiology-1

- IgE mediated type-1 hypersensitivity reaction
  - Previously sensitized to allergen/ antigen
  - Generates an immune response, mainly IgE
  - Mast cells coated with IgE
  - Subsequent exposure to same antigen leads to binding to IgE & exaggerated response
  - Response is not proportional to antigen load
  - Histamine, Leukotrienes, Serotonin
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# Pathophysiology-1




# Time To Cardiac Arrest After Exposure






# Commonly Identified Triggers

- Food – Peanuts, fish, milk
  - Stings -Wasps
  - Medicine – Penicillin's, cephalosporin's, suxamethonium, NSAIDs, ACEi, Gelatin solutions
  - Cosmetics – Latex, hair dye
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# Diagnosis–Cardinal features

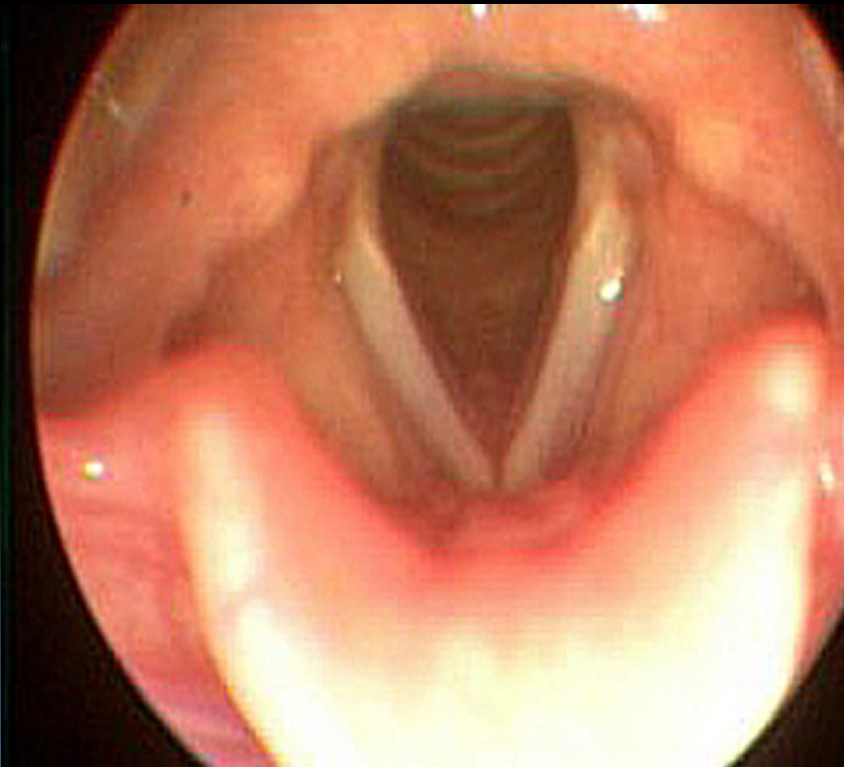
- Sudden onset & rapid progression
  - Features of compromised Airway +/- Breathing +/- Circulation
  - Skin/ mucous membrane lesions lesion
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# Pathophysiology & Clinical features-2

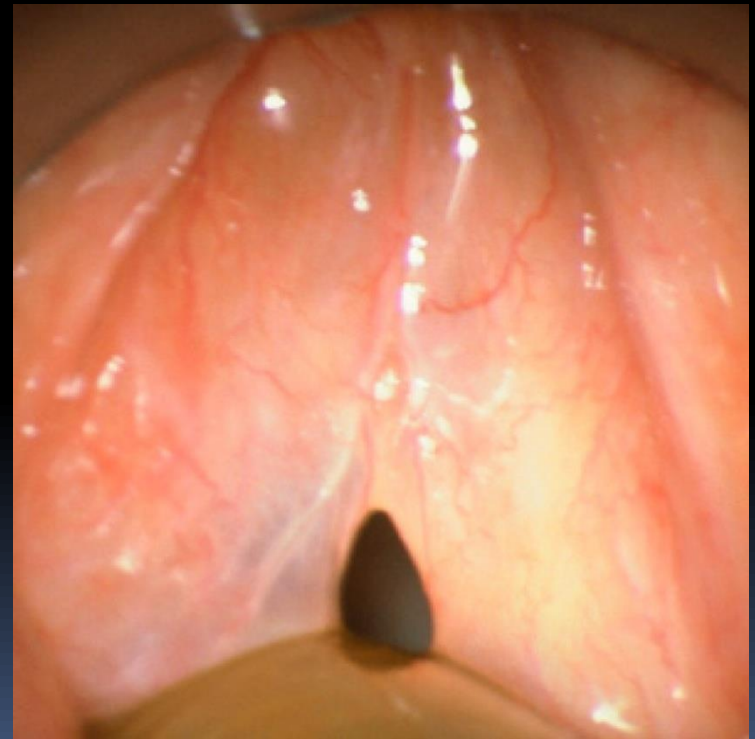
- Sudden onset, Rapid progression following exposure to an antigen
- Stridor, hoarseness,  
Increased capillary permeability,  
extravasation & edema e.g.. tongue,  
oropharynx, larynx - angioedema
- Rhonchi  
Dyspnoea, bronchospasm & secretions,  
exhaustion & respiratory arrest

# Laryngeal Edema

**Normal larynx**




**Edematous larynx**





# Pathophysiology & Clinical features-2


- Hypotension & Cardiac arrest
    - Vasodilation, reduces afterload
    - Venodilation reduces preload
    - Myocardial depression
  - Confusion – cerebral hypoxia
  - Flushing, angioedema, urticaria - Skin/ mucosal changes alone are not signs of anaphylaxis
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# Urticaria






# Pathophysiology & Clinical features-3

- Syncope – Cerebral hypoperfusion / hypotension
  - Diarrhea & vomiting – Edema & secretions of gastrointestinal tract
  - Differentiate from
    - Severe asthma
    - Septic shock
    - Cardiac failure
- 



# Anaphylactoid Reactions

- Similar clinical picture
  - Not a hypersensitivity reaction. Mediated by complement system (not IgE)  
Hence no previous exposure to antigen
  - Severity proportional to antigen load (dose)
  - Common cause – Radio- contrast media
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# Management - 1

- Aims

Restore oxygenation & perfusion of brain/ heart

Reverse pathological changes

Prevent repeat exposure





# Management - 2

## A.B.C.D.E Approach

- Stop further exposure to antigen – Stop injecting
- Call for help
- High flow O<sub>2</sub> via mask
- Assist ventilation /ambu bag
- Prepare for intubation
- Elevate lower limbs – increase venous return
- IV access/ IV crystalloid- What?

# High Flow Oxygen



# Assisted Ventilation via Ambu bag



# Management - 2

- Drug of choice

## ADRENALINE

As soon as possible!

Intramuscular (IM) 1:1000 0.5ml doses


Intravenous (IV) 1:10,000 0.5ml doses

# Adrenaline – Self injection





# Management - 3

- Hydrocortisone 200mg iv – to inhibit inflammatory response
  - H<sub>1</sub> receptor antagonist eg, Chlorpheniramine 10mg iv
  - H<sub>2</sub> receptor antagonist eg Ranitidine 50mg iv to inhibit further release of Histamine
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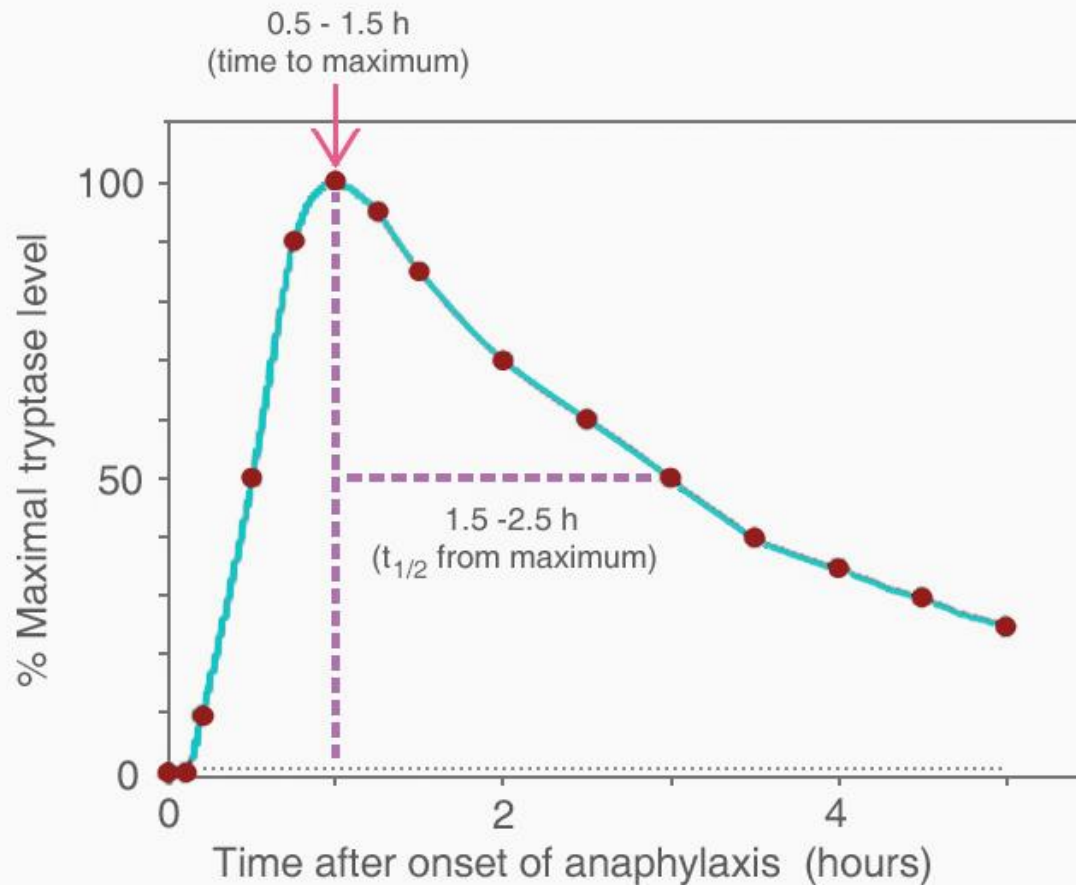
# Management - 4

- Serum tryptase assay
- Educate the patient
- Documentation
- Refer to immunologist



Medic alert bracelet to be worn by patient


# Serum Trypsin Assay







# Prevention of Complications

- Anticipate
  - Drug and allergic history
  - Check emergency equipment/ drugs daily
- 



# Case scenario - 1

- What is the diagnosis?
  - How do you manage the patient?
- 