PATIENT CARE THEORY 2

UNIT 10, PART 1: Anaphylaxis

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Anaphylaxis

- immediate, systemic, life-threatening reaction
- Associated with major changes in the **respiratory**, **cardiovascular, integumentary, nervous** and **GI** systems
- involves **prior sensitization to an allergen** with later re-exposure (production of IgE antibody); is a rapid hypersensitivity reaction following re-exposure
  - The more hypersensitive (faster the reaction) usually more severe
  - Can be passed from parent to child (IgE antibodies)
- allergens are harmless to most people

Anaphylaxis

- Symptoms result from the release of mediators from mast cells and basophils: histamine, leukotriene, prostaglandin and tryptase
- Histamine causes:
  - widespread vasodilation
  - capillary leakage
  - urticarial skin lesions
  - spasm of the bronchial smooth muscle (wheezes)
  - pruritis
  - swelling

Anaphylaxis

- Allergens
  - **Foods/ food additives** (e.g. cod, halibut, shellfish, cottonseed, egg white, food additives, mango, milk, peanut, soya bean, sesame and sunflower seeds, strawberries, tree-grown nuts, wheat and buckwheat)
  - Most common food allergens: peanuts, tree nuts, seafood, egg, milk products
  - **Insects** (e.g. bees, fire ants, hornets, wasps)
  - **Drugs** (e.g. antibiotics, cephalosporins, anti-cancer agents, insulin, local anesthetics, muscle relaxants, NSAIDS, opiates, vaccines)
  - **Animals**
  - **IV radiological contrast agents**
  - **Latex**
  - **Molds and Fungus**

Anaphylaxis

History

- History of allergy
- History of EpiPen use
- Exposure to probable allergen

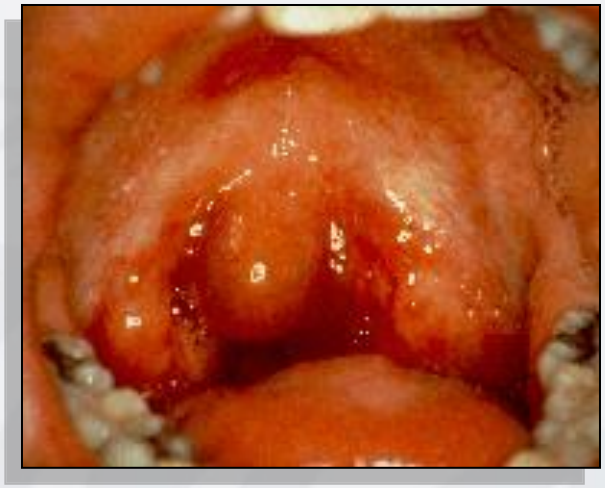
Anaphylaxis

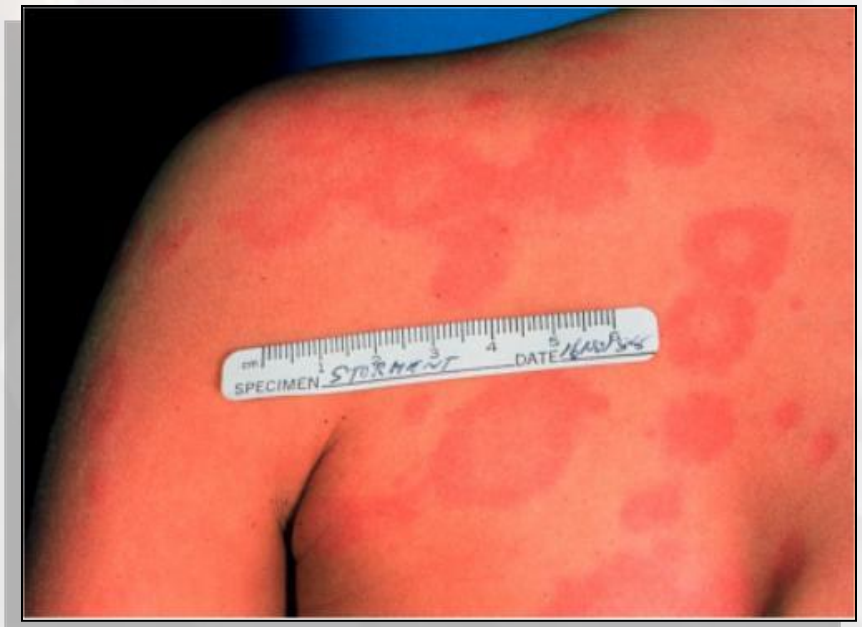
Presentation; symptoms usually begin within 30-60 seconds of exposure (small % of population may see symptoms delayed up to an hour)

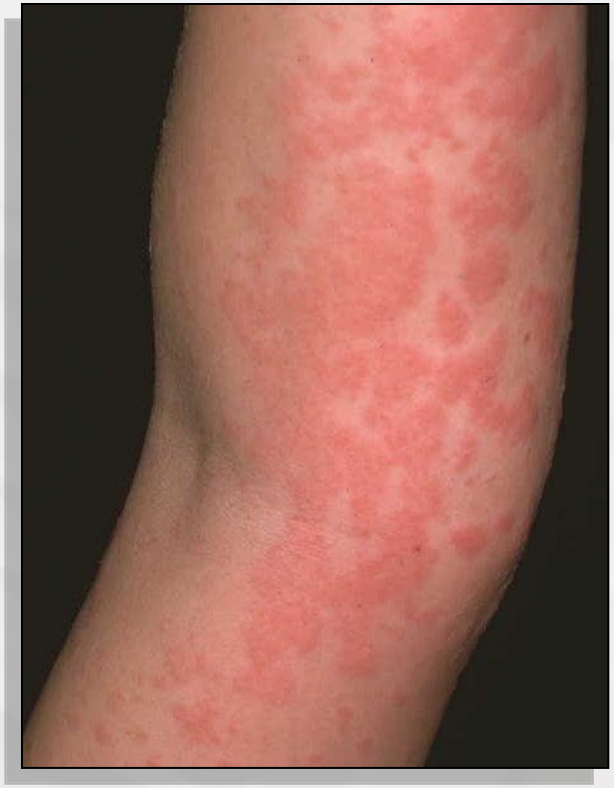
- **Airway**
  - airway edema, cough, sneeze +/- dysphasia/dysphagia or partial A/W obstruction with hoarseness or “tightness in the throat”
- **Respiratory**
  - dyspnea
  - bronchospasm & wheezing
- **Cardiovascular**
  - hypotension
- **Integumentary**
  - urticaria (hives)
  - erythema, pruritis, angioedema

Anaphylaxis

Presentation







Anaphylaxis

Notes:

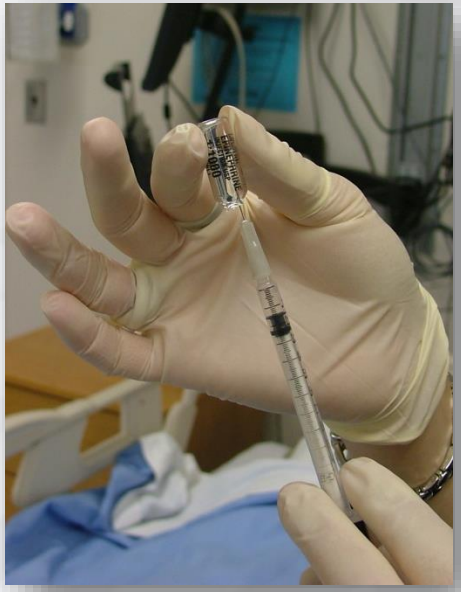
- More than 90% of patients have some combination of urticaria, erythema, pruritus, or angioedema (high sensitivity)
  - urticaria alone is not grounds for treatment with epinephrine
  - Conversely, **shock may occur without prominent skin manifestations or history of exposure**; therefore, anaphylaxis is part of the differential diagnosis for patients who present with shock and no obvious cause

Anaphylaxis

Presentation - other

- GI (less common, except with food allergies)
  - Abd pain
  - N/V
  - diarrhea
- Eyes
  - lacrimation, itching

Anaphylaxis



Management;

Remove patient from environment if still in contact with allergen

- for insect stings, look for stinger and remove
- Look for signs of trauma

Anaphylaxis

- Protect A/W
- PPV prn
- SpO_2 on RA, ECG
- O_2
- Epinephrine IM (1:1000)
  - 0.01 mg/kg (may round to the nearest 0.05 mg)
  - Maximum single dose is 0.5 mg
  - 2 dose only
- Ventolin prn, Diphenhydramine prn,
- IV TKVO prn, Transport

Anaphylaxis

Indications

Exposure to a probable allergen;

AND

Signs and/or symptoms of a moderate to severe allergic reaction (including anaphylaxis).

Anaphylaxis

Conditions

Epinephrine	
Age	N/A
Weight	N/A
LOA	N/A
HR	N/A
RR	N/A
SBP	N/A
Other	For anaphylaxis only

Diphenhydramine	
Age	N/A
Weight	≥25 kg
LOA	N/A
HR	N/A
RR	N/A
SBP	N/A
Other	N/A

Contraindications

Epinephrine
Allergy or sensitivity to epinephrine

Diphenhydramine
Allergy or sensitivity to diphenhydramine

Anaphylaxis

Treatment

Consider epinephrine	
	Route
	IM
	Concentration
	1 mg/mL = 1:1,000
Dose	0.01 mg/kg*
Max. single dose	0.5 mg
Dosing interval	Minimum 5 min
Max. # of doses	2

*The epinephrine dose may be rounded to the nearest 0.05 mg

Anaphylaxis

Consider diphenhydrAMINE		
	Weight	**Weight**
	≥ 25 kg to < 50 kg	≥ 50 kg
	Route	**Route**
	IV/IM	IV/IM
Dose	25 mg	50 mg
Max. single dose	25 mg	50 mg
Dosing interval	N/A	N/A
Max. # of doses	1	1

Clinical Considerations

EPINEPHrine administration takes priority over IV access.

IV administration of diphenhydrAMINE applies only to PCPs authorized for PCP Autonomous IV.

How to differentiate between a localized allergic reaction and an anaphylactic reaction

Diagnosis based on detailed history and recognition of presenting signs & symptoms post possible exposure to a possible allergen

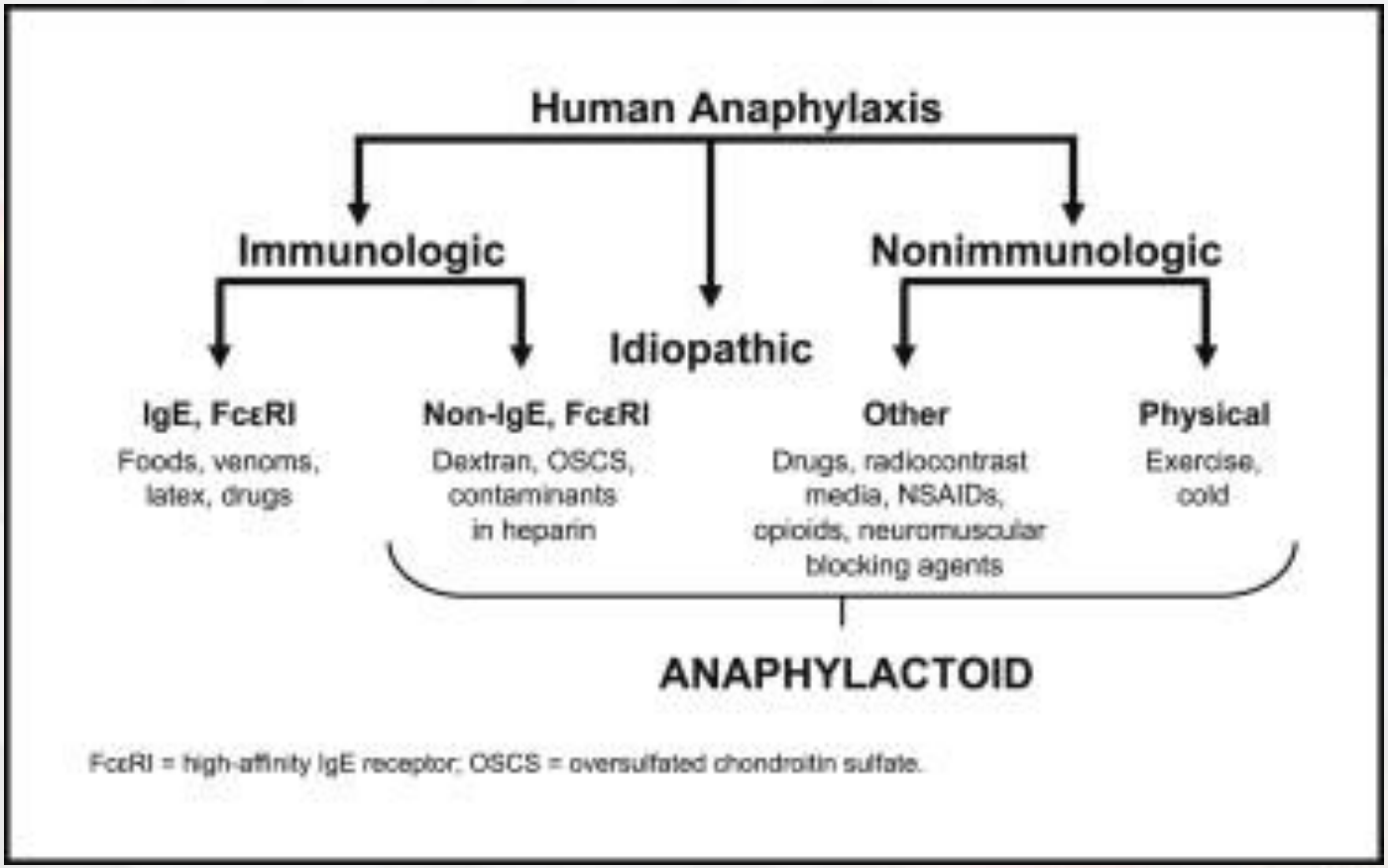
Body System Involvement

- **Integumentary** (skin): Hives, itching, flushing, swelling, angioedema
- **Cardio-Vascular**: Increased HR, decrease BP, syncope, decrease LOC, hypoxemia
- **Respiratory**: Shortness of breath, wheeze, cough, stridor
- **Gastro-Intestinal**: Cramping, nausea, vomiting, diarrhea

Localized Allergic Reaction	Anaphylactic Reaction
→ **Minor to Moderate Allergic Reaction**	→ **Moderate to Severe Allergic Reaction**
Localized reaction	Systemic reaction
Degranulation of localized mediators	Degranulation of systemic mediators
Involves one local area or one body organ system ****Severe symptoms to a single body system (respiratory system) should be considered as a severe allergic reaction****	***Usually*** involves symptoms in more than one body organ or system, with symptoms presenting as per above post exposure ****Severe symptoms to a single body system should be considered as a severe allergic reaction****
Degranulation of localized chemical mediators	Degranulation of systemic chemical mediators
	Some patients may present with a biphasic reaction within 72 hours of the initial symptoms having resolved without further exposure to an allergen
	Consider the following groups High Risk Patients: • Very young and very old • Hx asthma • Hx Cardiovascular disease • Hx Mast cell disease
Primary treatment: • Diphenhydramine (slow onset) relieves symptoms (itching, flushing, urticaria, angioedema, eye and nasal symptoms) does NOT prevent or relieve upper airway obstruction, hypotension, shock.	**Primary treatment:** • Epinephrine - concetration of 1mg/mL = 1:1000 IM (fast onset) will increase blood pressure, prevent and relieves hypotension, decreases upper airway obstruction, decreases wheezing, decreases urticaria and angioedema. **Secondary treatment to be considered post epinephrine administration:** • Diphenhydramine IM/IV • PRN IV Fluids as per Medical Directive • PRN Salbutamol as per Medical Directive

Anaphylactoid or nonimmunologic anaphylaxis

- Indistinguishable clinically from anaphylaxis
- Not an antigen-antibody mediated reaction – i.e. not mediated by IgE
- In an anaphylactoid reaction, exposure to an inciting substance (e.g. drug) causes direct release of mediators
- Clinical presentation is indistinguishable from anaphylaxis
  - Treatment is the same
- Important to note that these nonimmunologic reactions can occur *without prior sensitization*


Human Anaphylaxis
Immunologic
Idiopathic
Nonimmunologic
IgE, FcεRI
Foods, venoms, latex, drugs
Non-IgE, FcεRI
Dextran, OSCS, contaminants in heparin
Other
Drugs, radiocontrast media, NSAIDs, opioids, neuromuscular blocking agents
Physical
Exercise, cold
ANAPHYLACTOID
FcεRI = high-affinity IgE receptor; OSCS = oversulfated chondroitin sulfate.

Anaphylaxis

Special situations

- Patients on beta blockers may not respond to a single dose of epi

QUESTIONS