

The Night Joe's Crab Shack Almost Changed Everything

The Night

- Out for dinner
- 1930
- His friends are meeting his girlfriend for the first time
- All travel together to Joe's
 - 20 minutes away

The Arrival

- Girlfriend states to the wait staff that she has seafood allergies
- Asks for alternative choices for dinner
 - Brown rice dish
- Time is 2015

Antigen (Allergen)

- A foreign substance that stimulates formation specific protective proteins called antibodies
- 5 classes
 - IgE

Entry Routes

- Injected
 - Most common
- Inhaled
- Ingested
- Absorbed



Common Allergens

- | | |
|--------------------|---------------------|
| ▪ Peanuts | ▪ Antibiotics |
| ▪ Pollens | ▪ NSAIDS |
| ▪ Food additives | ▪ Sulfa medications |
| ▪ Muscle relaxants | ▪ Opiates |
| ▪ Insulin | ▪ Vaccines |
| ▪ Seafood | ▪ ASA |

And.....

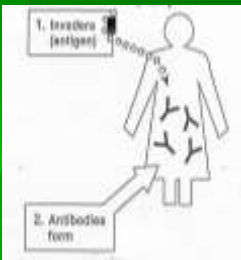
INSECTS



Pathophysiology of Anaphylaxis

- Four distinct events must occur:
 1. Person is exposed to an antigen
 2. Antigen/Antibody reaction
 3. Chemical mediators must be released
 4. Person must demonstrate a response to the mediators

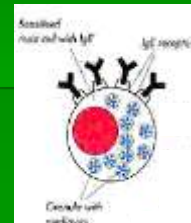
Sensitization



- Only takes place once
- Then the body develops antibodies
 - 1st exposure- antigen enters body and is marked as "foreign"
 - IgE antibodies are formed to combat the specific antigen

Sensitization

After the 1st exposure, the IgE antibodies affix themselves to receptor sites onto MAST cells



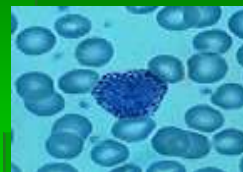
MAST cells



- **Stationary**
 - Connective tissue
 - Near large blood vessels
 - Skin, GI tract, respiratory tract
- Contain chemical mediators
 - Histamine, leukotrienes, kinins

Basophils

- **Blood stream**



- IgE antibodies attach to the cellular membrane
- Contain chemical mediators
 - Histamine and Heparin

Back to the Story....

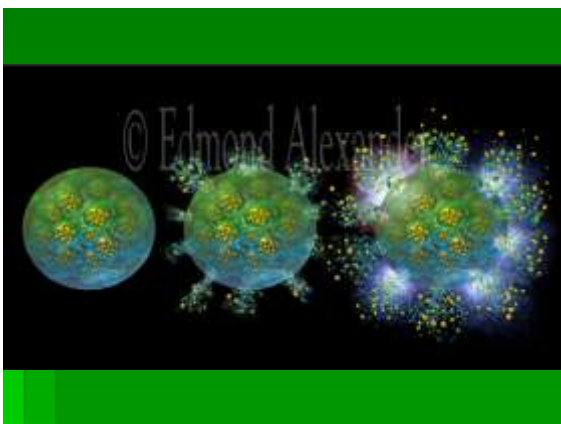
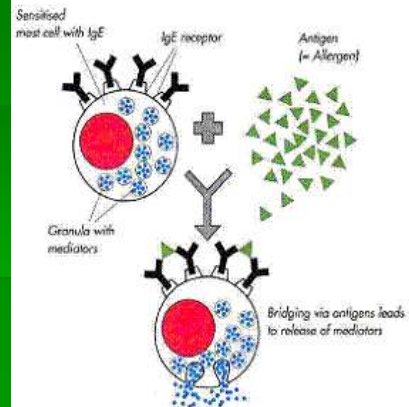
- Dinner finished
 - 2100
- Drive back to friend's home
- Girlfriend is in the backseat, looking nervous and slightly agitated

Subsequent Exposures

- Antigen binds to IgE causing a chemical breakdown
 - **Granulation**
- Basophils and MAST cells release their chemical mediators

IMPORTANT !

Chemical mediators released during MAST and Basophil granulation really are the "cause" of anaphylaxis!



Histamine

- Angio edema
 - Airway
- Mucous production
- Bronchoconstriction
- Vasodilation
 - Urticaria
 - Hypotension



Heparin

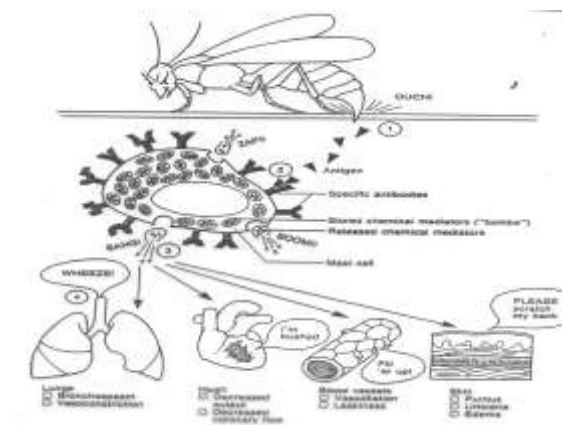
- “Thins out the mix”
- Peripheral edema
- Adds to hypotension

Kinins

- *Bradykinin* is 10x more powerful than histamine
- Cardiovascular collapse
 - Potent vasodilator
 - Increases permeability of post-capillary venules
- Smooth muscle spasmodic

Leukotrienes

- Generally, these have a slow onset, longer duration than histamine, and are 6,000 times more powerful
- Cause **coronary** vasoconstriction
- Increases vascular permeability

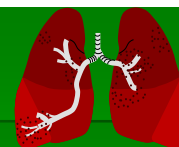


Back to the Story

- Arrive back at the friend's home
 - 2120
- Girlfriend is pacing the driveway
- Visibly agitated and having some noticeable difficulty breathing

Respiratory

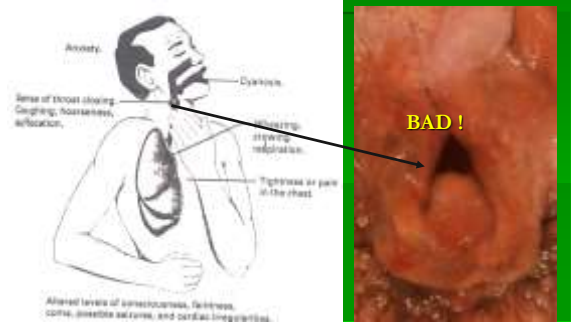
- **Upper Airway**
 - Hoarseness
 - Stridor
 - Laryngeal/Epiglottic edema
 - Uvular edema
 - Impaired phonation
 - Dyspnea
- **Lower Airway**
 - Bronchospasm
 - Increased mucous production
 - Accessory muscle use
 - Wheezing
 - Decreased breath sounds



Upper Airway Edema



Respiratory Manifestation

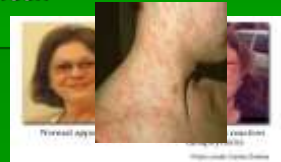


THE CHOICE....



The Decision

- Boyfriend starts the trip back home
 - 2130
- 2140 - Things worsen
 - Urticaria
 - Increased S.O.B.
 - Facial edema



Integumentary

- Urticaria
- Pruritis
- Erythema
- Angio edema
- Cyanosis
- Diaphoresis

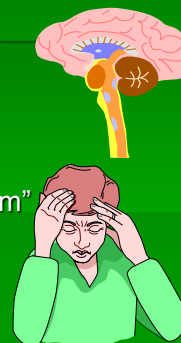


Panic

- Girlfriend asks if she's "going to die?"
- Systemic itching, hives
- Wheezing now very pronounced
- Boyfriend knows he can't make it to the hospital

Nervous System

- Anxiety, restlessness
- Disorientation
- Seizures
- Headache
- Feeling of "impending doom"
- Dizziness
- Syncope



2145



2150

- Boyfriend comes back to the car
- Girlfriend is hysterical/panicking, wheezing, scratching everywhere and has stripped down to her underwear
- Abdominal cramping
- 200 mg Benadryl administered p.o.

Cardiovascular

- Tachycardia
- Hypotension
- Dysrhythmias
 - PVC's
- Chest tightness
- Chest pain



Management of Anaphylaxis

- Geared towards reversing effects of mediators
- Follow normal Initial Assessment format
- Try to find causative agent, but don't waste time
- Be prepared to aggressively manage the airway and medicate

Airway and Breathing

- Evaluate the conscious patient for voice changes, stridor or a barking cough
- Complaints of tightness in the neck and dyspnea **suggest impending airway obstruction**

Airway and Breathing

- If airflow is impeded, endotracheal intubation may need to be performed
- If there is severe laryngeal and epiglottic edema, surgical or needle cricothyrotomy may be indicated

Circulation

- Fluid resuscitation in the presence of hypovolemia is warranted
 - Maintain peripheral perfusion
 - Large volumes may be necessary



Pharmacological Therapy

EPINEPHRINE is the first line drug of choice

LOCALIZED/MODERATE REACTION:

- 0.3-0.5 mg, 1:1,000 SQ for ADULT
- 0.01 ml/kg (max 0.3ml), 1:1,000 SQ PEDIATRIC

SEVERE REACTION:

- 1-2 ml, 1:10,000 IVP slow (5 min.) ADULT
- 0.05-0.15 mcg/kg/min IV infusion PEDIATRIC

Pharmacological Therapy

Diphenhydramine

- ◆ Localized
 - ◆ 50 mg P.O.
- ◆ Moderate
 - ◆ 25 to 50 mg I.M. or I.V.
- ◆ Severe
 - ◆ 50 mg I.V.



Pharmacological Therapy

CONTINUED BRONCHOSPASM

- ◆ **Albuterol** (Ventolin, Proventil)
 - ◆ 2.5 mg (0.5 ml of 0.5% solution) diluted to 3 ml via nebulizer
- ◆ **Methylprednisolone** (Solu-medrol)
 - ◆ 125 mg I.V. (preferred) or I.M. – adult

Pharmacological Therapy

CONTINUED HYPOTENSION

- ◆ Trendelenberg
- ◆ Glucagon
 - ◆ Beta-blocker therapy
- ◆ Vasopressors
 - ◆ Dopamine
 - ◆ 5 to 20 mcg/kg/minute
 - ◆ Epinephrine infusion
 - ◆ 2-10 mcg/min

The Result....

- 2200
 - Symptoms resolve relatively briskly
- Sleeps the remainder of the hour trip home
- Residual hives and swelling into the next morning

QUESTIONS ?

Christopher Ebricht

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Resources

- <http://www2.austincc.edu/barnes/allre-act/sld010.htm>
- Randall W. Benner, M.Ed., NREMT-P
- Jon F Levine
- Joe Lex, MD, FACEP, FAAEM
- Brady Paramedic CD, Ch. 31
- Mosby Paramedic CD, Ch. 31
- <http://www.ruralmedics.com/graphics/ekg.htm>

Resources

- <http://www.urticaria.thunderworksinc.com/pages/UrticariaPhotos/images/stomach1.jpg>
- <http://www.rch.org.au/emplibrary/clinicalguide/urticaria1a.jpg>
- http://homepages.uel.ac.uk/u0315748/project_files/image006.gif