Immunologic Emergencies

Allergies and Anaphylaxis
- Allergic Reaction
  - An exaggerated response by the immune system to a foreign substance
- Anaphylaxis
  - An unusual or exaggerated allergic reaction
  - A life-threatening emergency

Anaphylaxis
- Extreme allergic reaction
- Involves multiple organs
- Can rapidly result in death
- Most common signs:
  - Wheezing
  - Urticaria (hives)

The Immune System
- Lymphatic System
- Leukocytes (Basophils and Mast Cells)
- Lymphocytes (T & B Lymphocytes)
- Immunoglobulins:
  - IgM-Responds Immediately
  - IgG-Has Memory and Recognizes Repeated Invasion
  - IgA-Present in Mucous Membranes
  - IgE-Causes Allergic or Anaphylactic Reactions
  - IgD-Present in Lowest Concentration
- Mediators (Leukotrienes)

The Road to Anaphylaxis
- Sensitization
- Hypersensitivity
- Immunity
- Allergens
- Delayed Hypersensitivity
- Immediate Hypersensitivity

“The Reaction”
- Antigen
- Antibodies
- Immune Response
- Allergic Reaction
  - Histamine Release
  - SRSA Release
Signs & Symptoms of Anaphylaxis

- Upper Airway
  - Hoarseness
  - Stridor
  - Laryngeal/Epiglottic Edema
  - Rhinorhea

- Lower Airway
  - Bronchospasm
  - Increased Mucous Production
  - Dyspnea
  - Wheezing
  - Absent Breath Sounds

- Gastrointestinal System
  - Nausea and Vomiting
  - Abdominal Cramps
  - Diarrhea

- Cardiovascular System
  - Tachycardia
  - Hypotension
  - Dysrhythmias
  - Chest Tightness

- Neurological System
  - Anxiety/Dizziness
  - Syncope/Weakness/HA
  - Seizure/Coma

- Cutaneous System
  - Edema/Angioedema
  - Urticaria
  - Itching
  - Warm Feeling

Five General Allergen Categories

- Insect bites and stings
- Medications
- Plants
- Food
- Chemicals

Insect Bites and Stings

- Death from insect stings outnumber those from snakebites.
- Venom is injected through stinging organ.
- Some insects and ants can sting repeatedly.

How do we remove stingers?

Signs and Symptoms

- Sudden pain, swelling, and redness at site
- Itching and sometimes a wheal
- Sometimes dramatic swelling
Anaphylactic Reactions to Stings
- 5% of all people are allergic to bee, hornet, yellow jacket, and wasp stings.
- Anaphylaxis accounts for approximately 200 deaths a year.
- Most deaths occur within half an hour of being stung.

Patient Assessment
- Allergic symptoms are almost as varied as allergens themselves.
- Assessment should include evaluations of:
  - Respiratory system
  - Circulatory system
  - Mental status
  - Skin

Emergency Medical Care
- Give oxygen.
- Perform a focused history and physical examination.
  - Find out if the patient has a history of allergies.
- Obtain baseline vital signs and a SAMPLE history.
- Inform medical control.
- Find out if the patient has a prescribed auto-injector.
- Be prepared to use standard airway procedures.
- Assist the patient with the auto-injector if permitted.

Using an Auto-Injector
- Receive order from medical direction.
- Follow BSI precautions.
- Make sure the prescription is for the patient.
- Make sure the medication is not discolored or expired.

Administering an Auto-Injector
- Remove the safety cap.
- Place tip of the injector against the lateral side of the patient’s thigh.
- Push the injector firmly and hold until all of the medication is injected.
- Remove the injector.
- Record the time and dose.
- Reassess and record vitals every 2 minutes.

Anaphylaxis Kit
Epinephrine Side Effects

- Tachycardia
- Pallor
- Dizziness
- Chest pain
- Headache
- Nausea
- Vomiting

Black Widow

- Found in all states except Alaska
- Venom poisonous to nerve tissue
- Requires patient transport as soon as possible

Brown Recluse

- Mostly in Southern and Central US
- Venom causes local tissue damage
- Requires patient transport as soon as possible

Stages of Tissue Damage
Snake Bites
- 40,000 to 50,000 reported snake bites in the US annually.
- 7,000 bites in the US come from poisonous snakes.
  - Death from snake bites is rare.
  - About 15 deaths occur each year in the US

Four Types of Poisonous Snakes in the US
- Copperhead
- Cottonmouth
- Coral snake
- Rattlesnake

Snakebites
- Pit Viper Bites
  - Venom destroys proteins and other tissue components.
- Coral Snake Bites
  - Venom is a neurotoxin that results in paralysis.

Pit Vipers
- Rattlesnakes, copperheads, and cotton mouths
- Store poison in pits behind nostrils
- Inject poison to victim through fangs

Signs and Symptoms of a Pit Viper Bite
- Severe burning at the bite site
- Swelling and bluish discoloration
- Bleeding at various distant sites
- Other signs may or may not include:
  - Weakness
  - Sweating
  - Fainting
  - Shock
**Care for Pit Viper Bites**
- Calm the patient.
- Locate bite and cleanse the area.
- Do not apply ice.
- Splint area to minimize movement.
- Watch out for vomiting caused by anxiety.
- Do not give anything by mouth.
- If the patient is bitten on the trunk, lay the patient supine and transport quickly.
- Monitor patient’s vital signs.
- Mark the swollen area with a pen.
- Care for shock if signs and symptoms develop.
- Bring the snake to hospital if it has been killed.

**Coral Snakes**
- Small snake with red, yellow, and black bands
- "Red on yellow will kill a fellow, red on black, venom will lack."
- Injects venom with teeth, using a chewing motion that leaves puncture wounds
- Causes paralysis of the nervous system

**Care for Coral Snake Bites**
- Quiet and reassure the patient.
- Flush the area with 1 to 2 quarts of warm, soapy water.
- Do not apply ice.
- Splint the extremity.
- Check and monitor baseline vital signs.
- Keep the patient warm and elevate the lower extremities to help prevent shock.
- Give supplemental oxygen if needed.
- Transport promptly. Give advance notice to hospital of coral snake bite.
- Give the patient nothing by mouth.

**Scorpion Stings**
- Venom gland and stinger found in the tail end.
- Mostly found in southwestern US
- Last known death in United States in 1971
- With one exception, the Centruroides sculpturatus, most stings are only painful.
- Provide BLS care and transport.

**Tick Bites**
- Ticks attach themselves to the skin.
- Bite is not painful, but potential exposure to infecting organisms is dangerous.
- Ticks commonly carry Rocky Mountain spotted fever or Lyme disease.

**Rocky Mountain Spotted Fever**
- Rocky Mountain spotted fever develops 7 to 10 days after bite.
- Symptoms include:
  - Nausea, vomiting
  - Headache
  - Weakness
  - Paralysis
  - Possible cardiorespiratory collapse
Lyme Disease
- Lyme disease is the second fastest growing infectious disease next to AIDS in US.
- Lyme disease symptoms may begin 3 days after the bite.
- Symptoms include:
  - Rash
  - Painful swelling of the joints

Caring for a Tick Bite
- Do not attempt to suffocate or burn tick.
- Use fine tweezers to grasp tick by the body and pull it straight out.
- Cover the area with disinfectant and save the tick for identification.
- Provide any necessary supportive emergency care and transport.

Dog Bites and Rabies
- All dog bites should be considered infectious until proven otherwise.
- Place a dry sterile dressing over the wound and transport promptly.
- Rabies, an acute viral infection to the central nervous system, is a major concern.

Care for Human Bites
- Remember, human bites that penetrate the skin can be serious injuries.
- Promptly immobilize the area.
- Apply a dry, sterile dressing.
- Provide transport.

Coelenterates
- Responsible for more envenomations than any other marine life animal.
- Has stinging cells called nematocytes.
- Results in very painful, reddish lesions.
- Symptoms include headache, dizziness, muscle cramps, and fainting.

Care for Stings
- Limit further discharge by minimizing patient movement.
- Inactivate nematocytes by applying alcohol and heat pack/hot water.
- Remove the remaining tentacles by scraping them off.
- Provide transport to hospital.
Questions?