Envenomations
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What you may encounter locally
What to do
Local Envenomations

- **Venomous snakes** (Copperhead, Various rattlers, Coral snake, Cottonmouth)

- **Hymenoptera** (bees, wasps, and fire ants)

- **Venomous spiders** (Black widow, Brown recluse, the notorious “MRSA” spider)
Copperhead Identification

SC DNR website denotes copperhead population as “abundant” in our state.
Copperhead Bites
Prehospital Management

- Do **NOT** incise the wound, apply suction, apply tourniquets, ice, electricity, or heat.
- Do **NOT** attempt to catch, kill, or handle live snakes or handle dead snakes. Snakes are still capable of striking, biting, or causing significant envenomation even after death or decapitation.
Prehospital Management

- Remove constricting jewelry or clothing.
- Immobilize and elevate bitten extremity
- Mark and time the leading edge of the edema/erythema
- Establish IV access if available
- Monitor vital signs and mental status closely
- Transport immediately and rapidly
Hospital Management

- Evaluate and stabilize Airway, Breathing, Circulation. Establish IV access and monitor if not already done.
- Continue to mark the leading edge of swelling and tenderness every 15-30 minutes.
- Immobilization and elevation of affected extremity to reduce swelling. Major joints such as elbow should be maintained in relative extension.
- Treat pain (IV opioids preferred; avoid NSAIDs).
- Obtain initial lab studies (protime, hgb, platelets, fibrinogen).
- Update tetanus.
- Contact Poison Control Center.
In February 2011, a geographically diverse panel of 9 experts convened to derive an evidence informed unified treatment algorithm for crotaline snake bites authored by Lavonas et al.

Antivenom is expensive; GHS pays $2,200 per vial.

Administration of antivenom, in adequate doses, effectively halts the spread of local tissue effects (does not reverse ones already present), reduces hematologic venom effects, and reduces systemic effects resulting from crotaline envenomation.
Indications for CROFAB Antivenom

• Treatment with antivenom is indicated for any patient with progressive local tissue effects, and systemic signs attributable to venom.

• All patients seen early after envenomation with significantly abnormal PT, fibrinogen, and/or platelet count caused by the envenomation should receive antivenom as well as patients with hypotension, systemic bleeding, or other systemic venom effects.
Dosing of CROFAB

- Most copperhead snake victims can be successfully treated with a single 4-vial dose. Pediatric dosing is the same as the adult dose.
- Skin testing is not necessary or recommended prior to administration of Crofab. Symptoms of acute anaphylactoid reactions, such as pruritus, urticarial, or wheezing occur in approximately 6% of patients.
Disposition

• Panel members recommend that “dry” bites be observed in a health care facility for at least 8 hours with repeat platelet count, PT, hgb, and fibrinogen measurement prior to discharge.

• Patients with apparently minor envenomation and no evidence of progression should be observed longer, in the range of 12-24 hours.

• Anyone receiving Crofab needs admission
The 3 families of greatest medical significance within this order are Apid (honeybees and bumblebees), Vespid (yellow jackets, hornets, wasps), and Formicid (fire ants).

Hymenoptera stings account for more deaths in the U.S. than any other envenomation.
Apid and Vespid

- Apid members (bees) can only sting once because their stinger is a modified ovipositor that resides in the abdomen. It is barbed and attached to a venom sac, and after the sting, the bee is disemboweled as the stinger detaches.

- Vespid (hornets, wasps, yellow jackets) do not eviscerate after stinging their victims because their stinger is smooth.
Type I Hypersensitivity Reaction

- **Type I: Anaphylactic or Immediate Hypersensitivity.** Symptoms usually occur distal to the sting site and include hives, pruritus, dyspnea, hypotension, loss of consciousness, and heart palpitations. Symptoms may start within 15 minutes after exposure but can be delayed for as long as 6 hours.

- **Upper airway obstruction** is the leading cause of death, with **intractable hypotension** the second leading cause of death.
Clinical Presentation of Hymenoptera Envenomation

- **Prodromal:** pruritus, metallic taste, feeling of impending doom
- **Vital signs:** tachycardia, tachypnea, hypotension, hypoxia
- **Dermatologic:** pain, flushing, warmth (from vasodilation), urticaria, edema
- **Respiratory:** wheezing, bronchospasm, bronchorrhea, cough, laryngeal edema, angioedema of tongue/upper airway, dyspnea
- **Cardiovascular:** syncope, tachydyrsrhythmias, dizziness
- **Abdominal:** nausea, vomiting, diarrhea, bloating, cramping
Prehospital Management

- Supportive care and transport to the nearest ED.
- Maintain patency of airway, supplemental oxygen, nebulized albuterol in presence of bronchospasm. Bag valve mask ventilation or endotracheal intubation may be required for severe respiratory compromise.
- IV access; local ice packs; elevate extremity to limit edema
- Intramuscular epinephrine in the event of a severe reaction
- IV diphenhydramine (Benadryl). May also be given po or IM if that is all you are capable of administering at the time.
- IV corticosteroids
- Hypotension is treated with IV boluses of normal saline and pressors as needed
Hospital Management

- Evaluate and stabilize Airway, Breathing, Circulation. Establish IV access and monitor if not already done.
- Update tetanus
- **Local Reactions:** Apid and Vespid envenomation typically result in localized pain and erythema that resolve in a few hours. Cold compresses and analgesics are all that are needed.
- Large local reactions may require the addition of antihistamines and corticosteroids to manage symptoms. **H1 antihistamine diphenhydramine** can be given IV, IM, or po depending upon the severity of the reaction. **H2 blockers** should also be administered, as the combination of H1 and H2 blockers appears to be superior to either agent alone. Addition of po **corticosteroids** can also be efficacious in mild local reactions.
More Hospital Care, Systemic Reaction

- **Systemic Reactions:** Anaphylactic reactions may cause upper airway edema and circulatory collapse, ultimately resulting in death. Epinephrine is the most rapid-acting and effective medication to reverse the life threatening complications of anaphylaxis and should be administered *immediately* for any patient with evidence of anaphylaxis.

- **Intramuscular route** is preferable. IV route should be reserved for patients in extremis since it may be associated with cardiac ischemia or dysrhythmias.

- **Delays in administration of epinephrine may allow the airway obstruction or cardiovascular collapse to progress to the point of irreversibility and death.**
Patients should be treated with .01mg/kg (usually .2-.5 mg, maximum dose .5mg) of the 1:1000 dilution of epinephrine intramuscularly, preferably in the lateral thigh. It can be continued at a dose of .01mg/kg IM at 20 minute intervals or an epi drip can be considered (.05-1 micrograms/kg/min; titrate to clinical effect).

In the cases of hypotension and cardiovascular compromise associated with anaphylaxis, 1 or 2 IM injections of epi and rapid NS infusions are usually efficacious. If the patient is refractory to these modalities then IV epinephrine should be initiated.
Corticosteroids

- Corticosteroids are recommended for all anaphylactic patients. Though corticosteroids have no immediate/acute benefit, they are thought to speed the resolution of angioedema and urticaria.
- In milder cases, oral corticosteroids such as prednisone can be dosed at 1mg/kg twice a day.
Disposition

• For a local reaction, consider po antihistamines and corticosteroids. Monitor 4-6 hours for large local reaction. If there is symptom improvement, patient may be cleared for discharge on antihistamines and steroids.

• For a systemic reaction, consider IM epi; IV, IM or po antihistamines (H1 and H2), and corticosteroids. In severe life threatening episodes, you may need to consider IV epi, and inhaled albuterol and racemic epi, airway management, and IV fluids. Consider hospitalization for monitoring, especially for late phase reactants or delayed hypersensitivity.
Spider Bites

• **Black Widows** (*Lactrodectus*) are usually easily recognized by their glossy black appearance with a red hourglass marking on the underside of the abdomen and are approximately 1 ½ inches with legs extended. They are typically located outside in protected places such as under stones, house steps, decks, barns, etc, preferring warm and dark places.

• The **Brown Recluse** (*Loxosceles*) is a small, light brown to yellow spider with a slim 3/8 inch body with long legs. It is shy and active mainly at night. During the day it rests in closets, boxes, under furniture, in attics under insulation, etc.
Black Widow, Lactrodectus

- The venom lacks cytotoxic agents so there is little tissue injury or tenderness at site of bite initially. 1-2 hrs later, there can be regional LAD, local pain, and central blanching at bite site with surrounding erythema. Systemic symptoms begin within about one hour of bite.

- The characteristic syndrome of a black widow envenomation is muscle pain, most classically abdominal pain and spasms with lesser involvement of cramping muscles of the flank, thighs, back, and chest. Headache, nausea/vomiting, and anxiety also occur. Less commonly, intercostal muscle pain and spasm can cause dyspnea, and the patient can exhibit hypertension, fever, diaphoresis, urinary retention, psychosis, hallucinations.
Prehospital Management

- Support Airway, Breathing, and Circulation. IV, O2, Monitor.
- Pain control
- Attempts to secure the spider may be helpful in confirming widow spider envenomation
Hospital Management

- **Grade I** – Mild Envenomation: local pain at envenomation site; normal vital signs
- **Tx**: Use cold packs, NSAIDs. Routine wound care. Update tetanus.
Hospital Management

- **Grade II** - Moderate Envenomation: muscular pain in the envenomated extremity; extension of muscle pain to the abdomen if bitten on a lower extremity or to the chest if envenomated on an upper extremity; local diaphoresis of envenomation site or involved extremity; normal vital signs

Hospital Management

- **Grade III**- Severe Envenomation: generalized muscular pain in the back/abdomen/chest; diaphoresis remote from envenomation site; abnormal vital signs, nausea and vomiting; headache  “Systemic Latrodectism”

- Tx: IV opioids and benzodiazepines, update tetanus. Local wound care. Consider giving anti-venom for persistent, severe symptoms.
Disposition

• Patients who present with a black widow spider bite may be observed for 4-6 hours for development of symptoms. Asymptomatic patients may then be discharged for further observation at home.

• Patients with muscle pain and cramping should not be sent home until their pain is controlled. Some will require hospitalization for continued treatment with IV opioids and benzodiazepines.
Brown Recluse, *Loxosceles*

- Venom contains many cytotoxic enzymes which aid the spider in capture/digestion of its prey.
- The initial bite may be painless, but early vesicle/bullae formation may occur 1-3 hrs after the bite. The wound increases in size over the next 12-24 hrs and develops central hemorrhagic vesicles and violaceous necrosis. The surrounding skin can display blanching and ischemia, with a rim of erythema and induration often described as “red, white, and blue.” Eschar formation follows necrosis 5-7 days after the bite. The ulcer can continue to expand for up to 6 wks, with the eschar eventually falling off in 7-14 days. The resulting denuded area heals by secondary intention.
USA Today
article July 28, 2014
“Got a Spider Bite? Most of the Time No Need to Panic”

“Increase in spider bite patients at Vanderbilt University Medical Center has created some concern…..”

Helpful tips in the article: “Ointments don’t work; neither does a coffee-ground poultice.”

“"This shouldn't be this, 'Oh, my God, the spiders are coming,' " she said. "The difference between two and four is not like going from 200 to 400." (quote from medical director of the Tennessee Poison Center)
Prehospital Management

- Supportive Care (Airway, Breathing, Circulation….)
- If possible, safely bring the spider in for identification
Hospital Management

- Dermal changes around the bite should be documented and marked for progression.
- Update tetanus.
- Systemic symptoms of loxoscelism require aggressive supportive therapy.
- Appropriate treatment for dermal lesions includes rest and elevation to minimize inflammation and venom spread. Antihistamines can minimize pruritus, and analgesics are frequently required for pain control.
Disposition

• Most patients with brown recluse spider bites can be discharged home with adequate pain control and good follow up for wound care.

• In the rare occasion of systemic toxicity, the patient should be hospitalized for supportive care until their symptoms of nausea, vomiting, malaise, rash, fever, arthralgias, thrombocytopenia, and hemolysis have been treated and resolved.
MRSA Spider
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References


- The above were referenced in a “Clinical Pearl @ Emedhome.com” sent out 4/16/14