

Northwest Community EMS System
Paramedic Education Program
Wildlife Envenomations: BITES/STINGS
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Reading assignment:
Aehlert: pp. 1124-1130

KNOWLEDGE OBJECTIVES

Upon reading the assigned text assignments and completion of the class and homework questions, each participant will independently do the following with a degree of accuracy that meets or exceeds the standards established for their scope of practice:

1. Describe the appearance, habitat, neurotoxic response to the venom, characteristics of the bite, and systemic symptoms of bites from black widow and brown recluse spiders and scorpions.
2. Identify the characteristics of a tick.
3. List three diseases spread by tick bites.
4. Describe Lyme disease, including the causative organism, the body organs and systems affected, mode of transmission, susceptibility and resistance, phases of signs and symptoms, patient management and control measures, and immunization.
5. Explain the differences between jelly fish, stingrays and Portuguese man-of-war in terms of their ability to inject toxins.
6. Compare and contrast the S&S of envenomations and interventions for marine animal stings.
7. List four venomous species of snakes in the U.S.
8. Compare and contrast the markings, nature of the bites, and treatment for bites from coral snakes and pit vipers.
9. Discuss common offending organisms, pathophysiology, assessment findings and management of a patient with a bite or sting.

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I. Introduction

- A. There were 82,133 reported toxicology emergencies in 2006 from wildlife stings or bites, but only seven deaths.
- B. Venoms vary greatly; toxic effects are local or systemic; immediate or delayed

II. Spiders

- A. Spiders do not pose a significant public health threat in any area of the world. While many common spiders can bite humans, most bites result in minor local injuries.
- B. Most spiders are insectivores. While biting, they inject neurotoxins (for paralysis) and tissue lysins (to digest the prey's tissues). The volume is usually too small to be hazardous to humans, although it is quite hazardous to insects! In the U.S., most spider bites occur in the southern states during the warmer months (Challenger Corp., 2008)

C. Black widow spider

- 1. **Description:** Most notorious spider in North America. The female or "black widow" has a shiny black coloration with an orange or **red marking on the bulbous abdomen resembling an hour glass**. They are usually less than an inch in length. The male is approximately half the size of the female, is non-venomous and brown in color. The female's nickname comes from the fact that after mating, she devours the male unless it leaves immediately.
- 2. **Habitat:** Found in all parts of the continental U.S. Commonly found in brush, under logs, stones, around clumps of vegetation, grain fields and vineyards. They rarely occupy buildings, but may be plentiful in barns, trash heaps, and outhouses. May come into homes on firewood or Christmas trees. A bite usually occurs when the web is disturbed.
- 3. Incidence: Over 2,500 reported bites in 2006 and no deaths.
- 4. The venom affects the body systemically, rather than only locally. It is a potent **neurotoxin** which affects the sympathetic and parasympathetic nervous systems. Response depends on patient's age, weight, and general health status.



5. Characteristics of bite

- a. Immediate localized pain, redness, and swelling. Patient may describe a sensation like a bee-sting.
- b. Develop a small red papule without pain or swelling
- c. Progressive spasms of all large muscles groups
- d. Within one hour: Develops back, chest, shoulder, or abdominal pain, muscle spasms and cramps which may result in truncal and abdominal rigidity or ascending motor paralysis without any tenderness to palpation.
- e. Pain often becomes intense and is accompanied by a high degree of anxiety
- f. Thready pulse
- g. Diaphoresis with uncommon pattern only over the bite area or just on the extremity where the bite occurred. May be diaphoretic only on the face or neck and dry everywhere else (*Brouhard, 2010*)
- h. Slurred speech
- i. H/A, dizziness, dysphagia, nausea, vomiting, ptosis and fever
- j. Severe, uncontrolled hypertension with or without seizures
- k. Decreased level of consciousness



6. **Morbidity:** Those at greatest risk are the very young, the aged, and those with underlying hypertension.
7. **Treatment**
 - a. Reassure patient
 - b. Remove all jewelry from limb; apply cold pack to bite
 - c. Administer muscle relaxant (midazolam) and pain medication (fentanyl)
 - d. Monitor vital signs and observe for hypertensive crisis
 - e. Transport immediately for antivenin at hospital

D. Brown recluse spider

1. **Description:** Belongs to the family of brown spiders. Adult body is usually $\frac{3}{4}$ " (7-15 mm) long and 3-5 mm wide; legs span the size of a quarter to a half dollar. Six eyes present in three pairs arranged in a sem-circle. Most other spiders have 8 eyes. Has a **violin-shaped dark marking on the back of its head and thorax**, hence its nickname "fiddle-back spider". Both sexes are of equal size and danger.
2. **Habitat:** Tends to be more plentiful in temperate and subtropical climates. Found Midwestern and midsouthern U.S. and Hawaii. Prefers sheltered, dry, dark, and undisturbed areas in and around houses. Often found under loose bark, hollow logs, under stones, in darkened storage areas, closets, basements, attics, wood piles, trunks, cupboards, and stored clothing. Timid. Those living outdoors hibernate in winter, so most bites occur between March and October.
3. **Characteristics of bite**
 - a. **Neurotoxic** venom with local rather than systemic effects. Composed of at least 11 peptides with a variety of cytotoxic properties (Aehlert, 2010).
 - b. Initially painless; may go unnoticed until symptoms appear. Many occur at night while victim is sleeping.
 - c. Usually inflicted where skin is thin as spider has weak fangs
 - d. Multiple bites unusual
 - e. Bite wound starts as a central blister (bleb or papule) surrounded by a white ring that starts in a few minutes and develops 2-8 hours after the bite.
 - (1) Followed in 6-12 hours by a lesion that is edematous with a mottled center that has an irregular border that precedes larger blister formation or skin necrosis. The wound resembles "an egg thrown against a wall" and has localized pain, redness, and swelling. Differential at this point: MRSA.
 - (2) 12-24 hours after the bite the wound is red, white, and blue with a central necrotic (black) area surrounded by an ischemic zone, surrounded by an area of redness.
 - (3) The necrotic zone may enlarge over days to weeks resulting in local tissue loss that may require skin grafting to cover the wound. The ulcers are slow to heal, frequently lasting for months.
 - (4) **Systemic symptoms:** Rare: Chills, fever, nausea & vomiting, headache, malaise, joint pain, and bleeding disorders (DIC & hemolytic anemia) 12-24 hours after the bite. Systemic symptoms are seen more frequently in children.
 - f. **Treatment:** Same as for black widow bite. Support ABCs if systemic symptoms present. Hospital may order antihistamines to reduce systemic reactions. No antivenin is available.



E. **Tarantulas**

1. Tarantulas that are toxic to humans are native to South America (the baboon or banana spider). The European tarantula (*Lycosa tarantula*) is actually a wolf spider and nonvenomous. The original eponymous syndrome is due to bites from an unrelated widow spider, but not to the U.S.
2. Exotic tarantulas are often kept as pets and may bite if provoked, with some localized pain and swelling. Treatment is supportive. More concerning, however, are the urticating hairs used as defenses by several species, including those common to the southwestern United States. These barbed hairs can provoke intense prolonged localized pruritis and possibly serious keratoconjunctivitis.

F. **Funnel-web spiders** (Myglaomorphs) are restricted to southern and southeastern Australia, Tasmania, Papua New Guineas, and the Solomon Islands. The Sydney funnel-web spider (*Atrax robustus*) is particularly aggressive and possesses a potent venom that can result in human fatalities. A specific antivenom is available from the Australian Commonwealth Serum Laboratories (Challenger Corp., 2008).

III. **Scorpions**

A. **Description:** Vilified arthropod. Yellowish-brown, may be striped and usually 1-3 inches long. Has a venom gland and a stinger at the end of its tail. Stings only when provoked and injects a small quantity of venom. Fatal stings are infrequent.

B. **Habitat:** Most of the 1500 species come from tropical and subtropical regions. More than 600 species in U.S. Carnivores and active at night. They hide under debris and buildings during the day and move at night. Arizona has only dangerously venomous species (bark scorpion, *Centruroides exilicauda*).

C. **Characteristics of bite**

1. **Neurotoxic venom** acts on central nervous system by affecting cardiac and respiratory centers.
2. Mild to sharp localized pain which progresses to numbness
3. Local swelling, discoloration unusual for bark scorpion; venom does not induce local inflammation.

D. **Systemic complications**

1. CNS stimulation through SNS: tachycardia, hypertension
2. Diaphoresis, gooseflesh
3. Hyperglycemia
4. Occasional fever
5. **Severe systemic reaction: peaks in 5 hours**
 - a. Increased restlessness, muscle twitching, jerking, writhing, and flailing (break dancing)
 - b. Circulatory collapse
 - c. Severe muscle twitching/contractions
 - d. Abdominal pain and cramping; N/V
 - e. Excessive salivation
 - f. Nausea/vomiting
 - g. Slurred speech
 - h. Hypertension
 - i. Seizures and cardiac arrest

E. **Treatment**

1. Supportive: IMC - reassure victim; no deaths since 1970
2. Apply loose constrictive band to occlude lymphatic flow only (watchband)
3. Put limb immediately in ice water or apply cold pack to help slow the absorption of the venom

4. Avoid use of analgesics which may increase respiratory symptoms
5. Antivenin available at hospital (Arizona)

IV. **Hymenoptera (bees, wasps, hornets, yellow jackets) and ant stings**

- A. **Habitat:** Bees obtain food from pollen; wasps are scavengers, usually feeding on carrion or dung heaps. Because of this, wasp stings have a higher rate of secondary infection than either ants or bees.
- B. **Characteristics of bites**
 1. Honeybees are the most deadly animals in the US. They are responsible for about 25% of all deaths from animal envenomation, almost as many deaths as from the bites of all venomous snakes combined.
 2. Bees and wasps have similar injection systems, and responses to their venom are alike. The stinger is a semi-hollow device leading to the venom sacs. In the bee the stinger has larger barbs, which cause the stinger and abdomen to be torn off when the bee stings, causing death. Wasp and hornets' stingers remain intact in most cases, and these insects can sting numerous times.
 3. Non-allergic deaths have resulted from as few as 100 bee stings, although individuals have survived 2,500 stings.
- C. **Local reactions:** Patient remains alert & oriented, c/o hives and edema at the site of exposure or GI distress after food ingestions. BP > 90.
- D. **Mild systemic reactions:** S&S may include peripheral tingling, warm sensation, fullness of the mouth and throat, nasal congestion, periorbital swelling, rash, itching, tearing of the eyes, and sneezing. BP > 90; no major pulmonary S&S; perfusing well.
- E. **Moderate systemic reactions:** S&S include any of the above plus one or more of the following: **bronchospasm**, edema of the airways or larynx with dyspnea, cough, and wheezing or diminished breath sounds, soft tissue edema, flushing, nausea, vomiting, warmth and anxiety. BP > 90.
- F. **Severe systemic reaction/Anaphylactic shock:** 1% of the population is severely allergic to the venom of bees.

Presenting S&S

1. Pain, edema at site that becomes widespread (periorbital, tongue, lips, face swelling common)
 2. Muscle spasms, chest tightness
 3. Bronchospasm; wheezing to silent chest
 4. Edema of airways and/or larynx (throat tightness)
 5. Hoarseness, stridor
 6. **Severe dyspnea:** lower airways fill with thick mucous that plugs bronchioles
 7. Cyanosis
 8. Tachycardia, **hypotension (BP < 90)** from massive vasodilation (**SHOCK**)
 9. Warm, flushed skin due to vasodilation; rash
 10. Cardiac dysrhythmias
 11. Restlessness - may progress rapidly to coma without experiencing respiratory distress
 12. GI edema results in dysphagia, intensive abdominal cramping, diarrhea, and vomiting
 13. Death may result from respiratory or circulatory collapse
- G. **Treatment**
1. Apply venous constricting band proximal to bite or injection site if swelling is increasing rapidly in an extremity.
 2. Attempt to identify and/or remove inciting cause: scrape off bee stinger, do not tweeze out.

3. Supportive; application of cold pack to sting.
4. Do not start an IV in the same extremity as the bite injection site.
5. IMC; **treat per Allergic Reaction/Anaphylaxis SOP**

V. **Tick bites**

- A. **Description:** Large mites that live by feeding on the blood of warm-blooded animals, including man. Attack all vertebrates except fish. Ticks use their mouth parts to inflict a bite then bury their heads under the skin. All parts of the tick are infective, so they should not be brushed, it must be removed whole. Petroleum, kerosene, oil, gasoline, nail polish may cause the tick to retreat. Have been known to survive without feeding for 4 years. The female tick must have a blood meal before laying eggs and commonly engorges with blood until several times her normal size before leaving the host.
- B. **Diseases spread by ticks:** Rocky Mountain Spotted Fever, Q fever, Lyme Disease (deer tick), tick paralysis (rare - caused by prolonged bite of a female wood tick).
- C. **Lyme disease**
 1. Multi-system recurrent inflammatory disease caused by infections with the *Borrelia burgdorferi* spirochete found in deer ticks carried by deer and mice.
 2. Most common vector-borne disease in US (Bledsoe, 2006). There have been over 99,000 cases since 1982, mostly in the NE, upper Midwest and Pacific coast parts of the country. More prevalent in wooded areas including residential yards.
 3. Incubation: 3-21 days
 4. **S&S early localized stage:** Painless, flat, red lesion appears at the bite site. In some patients, a **ring-like rash** forms (*erythema migrans*) 3 to 30 days after exposure and spreads outward. The outer border stays red but the center becomes clear, blue or necrotic (Bledsoe, 2006). Additional S&S: headaches, migraines in 60%-80% of cases; fever, fatigue, muscle and joint aches.
 5. **S&S Early disseminated stage:** Spirochete spreads to skin, nervous system, heart, and joints. May develop meningitis, Bell's palsy (CN VII), peripheral neuropathy. Cardiac involvement may cause conduction defects (AV blocks) and myopathy. Lasts a few weeks but may recur. Arthritis and muscle aches are common months after infection.
 6. **S&S late stage (persistent infection):** Can occur months to years after original bite. Complications include chronic arthritis and neurological abnormalities including encephalopathy with cognitive deficits, depression and sleep disorders. Polyarthritis of more than one joint is common.
 7. **EMS care:** IMC, treat consequences of exposure. If responding immediately, check all clothing for evidence of ticks and remove them by covering with soap and water (tick may back out – or grasp as close to the head as possible and pulling gently. Do not crush. Wash wound with soap and water. Antibiotics are usually effective in treating acute stages of the disease.
 8. **Vaccine:** LyMerix; approved by FDA in 1998 for people 15-70 years of age. Given in 3 doses at 0, 1, and 12 months by IM injection in the deltoid muscle. All three doses are necessary for effectiveness. Should not be given to those on anti-coagulants. Will not prevent the disease in undiagnosed cases at the time of vaccination. Duration of immunity is unknown.
 9. Screening test for the disease: ELISA will test positive; more specific test is Western blot.

VI. **Marine animals**

- A. Mostly not aggressive
- B. Injuries commonly caused by:

1. Jellyfish, Portuguese man-of-war, sea anemones, corals, or hydras
2. Stepping on stingray's back, sea urchin, fire coral
3. Shock from electric eels

C. Description

1. **Jellyfish:** Both living and dead jellyfish as well as their separated tentacles can cause envenomation. There are 19 species found in North American and Hawaiian waters. Sting is linear, painful, causes a red rash which may blister and persist for 7 days. Severe envenomation produces systemic symptoms involving multiple organ systems.
2. **Portuguese man-of-war:** Looks like a jellyfish, but is different. Found in the Gulf of Mexico and off the Florida coast from July to September. Toxin produces histamine release and vasodilation. More likelihood of a severe reaction than a jellyfish.
3. **Stingrays:** Most commonly encountered venomous fish with approx. 2,000 stings reported annually. Eleven species in US coastal waters. Rays burrow in sand beneath shallow water. When startled, they curl their tails upward, the barbs cause venom-laden lacerations and punctures. Secondary infection is common.

D. Mechanisms of injury

1. Class 1: Bites: sharks, barracuda, eels
2. Class 2: Stings: jellyfish
3. Class 3: Spines/puncture wounds: sea urchins, sting rays, sculpins
4. Class 4: Poisonous bites: sea snakes, blue ringed octopus
5. Class 5: Lacerations: corals, barnacles

E. Immediate problems and emergency treatments

1. Class 1 Bleeding, shock: hemostasis per SOP; supportive ALS care.
2. Class 2: Allergic reactions, shock: inactivate w/ hot water, vinegar (Portuguese man-of-wars) or alcohol; dust with talc, baking soda paste or shaving cream if available; and remove venom sacs or tentacles; supportive ALS care. DO NOT IMMERSE IN FRESH WATER. Topical lidocaine relieves the pain of Jellyfish stings. "The principle behind the use of lidocaine is that it acts as a local anesthetic (and) appears to inhibit the further discharge of nematocysts remaining on the skin," (Ward, 2012). Nematocysts are the venom sacs jellyfish leave behind after they sting. Simple hot water may help by denaturing and inactivating the venom. Carefully remove the venom sacs from the skin and wash the area with saltwater. Avoid crushing the sacs and spreading the venom. Do not wipe with a towel.
3. Class 3 Pain: inactivate with **hot water** (110-113°) for 30-45 min., supportive care
4. Class 4: Venous bands controversial, supportive care
5. Class 5: Pain, bleeding: cleanse, control bleeding

VII. Snake bites

- A. **Description:** 2500-3000 species of snakes. Only 375 are venomous. Many venomous snakes are relatively small with short fangs, so their bite is easily deflected by normal clothing and shoes.
- B. **Incidence:** Most bites occur when a snake is being handled or attacked, with smaller numbers occurring from accidentally stepping on snakes or threatening them unintentionally. 90% of envenomations occur between April and October. Snakes are active in warmer months.
- C. **Morbidity & mortality:** Most venomous snakes have only a 10-20% death rate in untreated bites. 3000 venom exposures; 4 fatalities in 2006

D. **Types of toxins**

1. Neurotoxic
2. Hemotoxic
3. Cardiotoxic
4. Most venom is a complex mixture of proteins that contain some of all types

E. **Four types of venomous species in US**

1. **Pit vipers**

- a. Triangular head with distinctive foramen or **pit** located between each eye and nostril in the maxillary bone
- b. Vertical, elliptical pupils
- c. Large, hollow fangs in roof of mouth inject venom from two sacs at back of head
- d. Fangs are hinged to swing back & forth as mouth opens
- e. 3 pairs of replacement fangs in various stages of development behind each functional fang
- f. No fangless or de-fanged snake remains non-poisonous indefinitely!
- g. **Rattlesnakes** (16 species). Has horned rings on the tail that strike against each other to produce the rattling sound. 65% of all venomous snake bites in US each year.
 - (1) Eastern diamondback largest (5 ft) and most dangerous in eastern US.
 - (2) Timber rattlesnake: 2nd largest and 2nd most dangerous
 - (3) Multicolor often with diamond pattern
 - (4) Horned rings on tail strike against each other to produce rattling sound
- h. **Copperheads**: Color = copper to various shades of brown. 24-36". Habitat: mountains, wooded hillsides, rock piles, quarries, and sawdust piles. Live within city limits and near suburban housing developments. Can strike with lightning speed.
- i. **Cottonmouths** (water moccasins): Aggressive! Dark olive green to black with black crossbands with a yellow undersurface - camouflaged in swampy marshes. Pale white oral mucosa highly visible when mouth is open. About 36" - 48" long. Habitat: swamps, lakes, streams, draining ditches, and rice fields. Can bite under water. Tissue destruction from their venom can be severe.
- j. **Pit vipers: characteristics of bite**
 - (1) Uses venom to disable and paralyze small prey, not as a defensive weapon
 - (2) Hydrolytic cocktail: Venom contains enzymes that destroy cell membranes & proteins causing tissue necrosis at bite site
 - (3) Systemic effects: Destroy RBCs, clotting defects, DIC, renal failure
 - (4) Severe bite can cause death within 30 min (shock); most occur within 48 hrs
 - (5) Cardinal signs and symptoms of pit viper envenomation are fang punctures about 0.5 inches apart, pain, edema that can expand rapidly, blisters and redness of the bite site and adjacent tissues.

- (6) Number and depth of punctures may vary. Superficial lacerations produced by fangs usually do not result in envenomation because the discharge orifice of the fang lies above the tip.
- (7) Moderate to severe pain around bite site (90%). Pain is sharp and burning and usually develops within 5 minutes. If local pain or tenderness has not developed within 1 hour of the bite, the snake was probably not poisonous or did not deposit venom (dry strike).
- (8) Edema and redness spread proximally and distally within 30 minutes and venom spreads. May continue to spread for 24 hours. May have continued oozing of blood from the wound site in a severe bite.
- (9) Weakness, dizziness, or faintness.
- (10) Some victims c/o a minty, metallic or rubbery taste in their mouths.
- (11) Sweating and/or chills; thirst
- (12) Nausea/vomiting; diarrhea
- (13) Tachycardia and hypotension (May develop hypotension and shock within 30 minutes in severe envenomations)
- (14) Bloody urine (hematuria) and gastrointestinal (GI) hemorrhage (late sign)
- (15) Ecchymosis; necrosis
- (16) Shallow respirations, progressive respiratory failure\
- (17) Numbness and tingling around face and head (classic). Facial and scalp paresthesias are signs of significant envenomations.

k. **Treatment for pit viper bite**

- (1) Remove patient from striking range (usually length of the snake)
- (2) Keep patient calm, position supine, explain that staying quiet will decrease the spread of any venom through the system.
- (3) Locate bite area: Remove all jewelry/constricting clothing from bitten extremity. Clean gently with soap and water or mild antiseptic.
- (4) Splint and immobilize bite site and/or extremity.
- (5) Use of constricting bands is not recommended.
- (6) IMC: Supportive care; start IV NS in unaffected extremity
- (7) **Do NOT** incise, suck out venom, or use ice or cold packs, freon spray, or electrical shock to retard or reverse venom spread.
- (8) Monitor ECG
- (9) Vomiting precautions; caused by anxiety more than toxins; NPO
- (10) If snake is dead, bring with you to hospital for proper ID
- (11) Transport ASAP for treatment with antivenin. The average dose of antivenin required is about 10-15 vials (Cost \$2,400 per vial). Some need more. Major complication is a risk for coagulopathy.
- (12) Monitor VS throughout transport

2. **Coral snake** (family also includes cobras and sea snakes)

- a. **Habitat and description:** Generally a small, non-aggressive snake found in the southwestern U.S. Has round eyes, a narrow head, and no pit.

- b. Unique markings include broad bandings of bright **black, yellow, red, yellow, and black** & a black nose. "Red on yellow will kill a fellow; red on black, venom will lack". Rarely bites humans. Has short fixed fangs, small mouth, and limited jaw expansion that cannot attach to an arm or leg so venom is injected by a succession of chewing motions. Wounds have one or more punctures or scratch-like marks.
 - c. **Presentation:** Venom contains neurotoxins as well as enzymes similar to that of pit vipers. Neurotoxin blocks ACh receptor sites causing progressive respiratory and skeletal muscle paralysis
 - d. There may be no local or systemic signs for as long as 12-24 hours. Venom may then cause paralysis of the nervous system.
 - (1) Localized numbness, weakness and drowsiness
 - (2) Ataxia
 - (3) Slurred speech and excessive salivation
 - (4) Paralysis of tongue and larynx (produces difficulty breathing and swallowing)
 - (5) Drooping of the eyelids (ptosis), double vision (diplopia), and dilated pupils
 - (6) Abdominal pain; nausea/vomiting
 - (7) Loss of consciousness
 - (8) Seizures
 - (9) Respiratory failure
 - (10) Hypotension
 - e. **Treatment for coral snake bite: Same as pit viper**
- F. **The ultimate severity of any venomous snake bite depends on the following:**
- 1. Size and species of snake
 - 2. Location of the bite
 - 3. Number of punctures
 - 4. Grade of envenomation
 - 5. Age, size, and underlying medical condition of the patient

References

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Ward. (2012) <http://bit.ly/L4TVrx> Ann Emerg Med as reported in Norton, A. Hot Water, Lidocaine Best for Easing Some Jellyfish Stings. Reuter Health Jun 21, 2012

Additional sources of information on insects and repellants:

www.tickinfo.com

<http://allergy.mcg.edu/ALK/fact.html>

<http://www.emeraldcoast.com/government/emergency/poison.htm>

http://www.uos.harvard.edu/ehs/hot_topics/pom_yellowjacket.html

Homework questions

1. What are the characteristic markings on a brown recluse spider?
2. What are the characteristic markings on a black widow spider?
3. Which wildlife animal bite presents as a bleb surrounded by a white halo and then progresses to erythema and tissue sloughing from black eschar over necrotic skin?
 - A. Mexican killer bee
 - B. Black widow spider
 - C. Brown recluse spider
 - D. Deer tick with Lyme disease
4. An adult has been clearing out vegetation in the woods behind his house and noticed a tiny red dot on his finger. He is now developing severe muscle cramps and pain that are spreading to his chest and abdomen. He is also complaining of headache, dizziness, and nausea. You note diaphoresis and slurred speech. Which bite is likely?
 - A. Fire ant
 - B. Scorpion
 - C. Black widow spider
 - D. Brown recluse spider
5. What should a paramedic administer to reduce the muscle spasms experienced by the above patient?

6. List three systemic complications of a scorpion bite:

7. What is the most deadly animal/insect in the U.S. in terms of deaths from bites/stings?

8. What should be applied to a patient who experienced a bee sting on the arm with a moderate systemic allergic reaction?
 - A. Hot pack to the sting area
 - B. Venous constricting band proximal to the sting
 - C. Arterial tourniquet between the sting and the heart
 - D. Poultice of baking soda and water to draw the toxin from the sting
9. How should a paramedic identify a coral snake? What are the characteristic markings?

10. How do coral snakes inject their venom?

11. What is the immediate treatment of a pit viper snake bite?
- A. Hot packs to break down the protein enzymes in the venom
 - B. Cold packs to decrease circulation slowing venom absorption
 - C. Immobilize the bitten extremity to slow circulation of the venom
 - D. Using the OB kit bulb syringe to suction the venom from the wound
12. Which of these IS NOT a pit viper?
- A. Coral snake
 - B. Copperhead
 - C. Rattle snake
 - D. Water moccasin
13. Which is an appropriate intervention for the puncture from the spines of spiny fish, sea urchin or sting ray?
- A. Excise the barb or spine
 - B. Apply ice packs to decrease swelling
 - C. Immobilize the area and soak it in hot water while in transport
 - D. Sprinkle the affected area with meat tenderizer to neutralize the poison
14. Alcohol may fix or denature the toxins from the stings/wounds of a
- A. Portuguese man-of-war or jelly fish.
 - C. anemone or spiny fish.
 - B. sea urchin or sting ray.
 - D. puffer fish or coral.
15. List three diseases that are spread by the bite of a tick:
