Chapter 2

Lesson 9

Bites, Stings, and Poisonous Hazards

Key Terms

allergic reaction
antivenim
calamine
discoloration
rabies
tetanus
venom

What You Will Learn to Do

- Determine first aid treatment for bites, stings, and poisonous hazards

Linked Core Abilities

- Do your share as a good citizen in your school, community, country, and the world

Skills and Knowledge You Will Gain along the Way

- Identify types of venoms
- Relate snakes to their bites
- Explain the effects of animal and human bites
- Identify the symptoms of insect bites and stings
- Associate the types of poisonous plants to the reactions they cause
- Determine how to treat for contact with poisonous plants
- Define key words contained in this lesson

Introduction

With so many outdoor activities to participate in, such as hiking, camping, bicycle riding, skate boarding, and skiing, it is common to come across emergencies involving bites, stings, and poisonous hazards. It is estimated that one of every two Americans will be bitten at some time by an animal. Dogs are responsible for about 80 percent of all animal bite injuries. Too, bee, wasp, and other types of insect stings can be not only painful, but fatal if the person is allergic. Depending upon where you live, the type of first aid you need to know for snakebites and plants will vary. Knowing what to do when outdoors can mean the difference between life and death.

Snakebites

If you spend much of your time outdoors, it may be common for you to come across snakes; however, your chances of a snakebite are remote if you remain alert and careful. There are both poisonous and nonpoisonous snakes, so the severity of a snakebite depends on whether the snake is poisonous or not. Beyond that, the severity of a snakebite depends on the type of snake, location of the bite, and the amount and type of venom injected.

Types of Snakes

There are approximately 130 different varieties of nonpoisonous snakes in the United States. They have oval-shaped heads and round pupils. Unlike pit vipers, nonpoisonous snakes do not have sensory pits with which to sense the body heat of their prey.

Poisonous snakes exist throughout the world, primarily in tropical to moderate climates. In the United States, there are four kinds of native poisonous snakes. Three of these four—the rattlesnake, copperhead, and cottonmouth (water moccasin)—are pit vipers. Pit vipers in other parts of the world include the bushmaster and fer-de-lance in Central and South America, the tropical rattlesnake in Central America, and the Malayan pit viper in eastern Asia. These snakes are shown in Figure 2.9.1.

Pit vipers have slit-like pupils; flat, triangular-shaped heads; small, deep, heat-sensing pits between their nostrils and eyes; and in most cases, hemotoxic **venom**. When a pit viper bites, it injects this venom from sacs through long, hollow fangs. This produces a severe burning pain, along with **discoloration** and swelling around the fang marks. The hemotoxin destroys blood cells, which causes the discoloration of the skin. Blisters and numbness in the affected area follow this reaction. Pit viper bites attack the circulatory system, possibly causing weakness, rapid pulse, and shortness of breath; as well as nausea, vomiting, and shock.

Key Note Term

venom – a poison produced by animals such as snakes and spiders that is transmitted by a bite or sting.

discoloration – altered or changed in color.

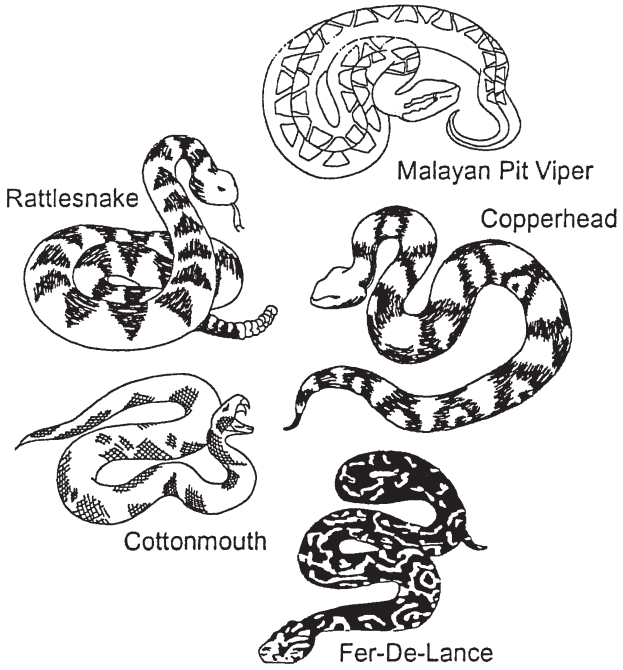


Figure 2.9.1: Common pit vipers.

Corals, cobras, kraits, and mambas belong to the cobra family (see Figure 2.9.2). The coral snake is the only one native to the United States. Rings of red, yellow, and black color encircle its body. Although other nonpoisonous snakes have the same colors, only the coral snake has a red ring next to a yellow ring. The cobra, found in Africa and Asia, forms a hood with its neck when on the defensive. The krait, found in India and southeast Asia, is brightly banded; the mamba in Africa is either almost black or green.

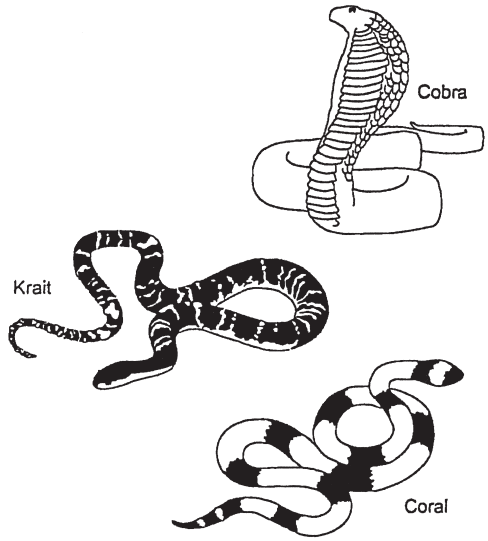


Figure 2.9.2: Members of the cobra family.

These snakes look very different, but all four inject their venom—a neurotoxin—through short, grooved fangs leaving a characteristic bite pattern, shown in Figure 2.9.3. There is minimal pain and swelling compared to a pit viper bite, but because their powerful venom affects the central nervous system, it can cause blurred vision, drooping eyelids, slurred speech, drowsiness, and increased salivation and sweating. Nausea, vomiting, shock, respiratory difficulty, paralysis, convulsions, and coma develop if the bite is not treated promptly.

Sea snakes are found in warm water areas of the Pacific and Indian Oceans. They have small heads, thick bodies, and tails flattened along the sides. Their fangs are only ¼ inch long, but their venom is very poisonous.

Types of Venoms

Basically, venoms are categorized as neurotoxins that affect the nervous system and can cause death by paralysis, hemotoxins that digest tissue including blood cells, or cardiotoxins that affect the heart directly.

Treating Snakebites

Snakebites are rarely fatal if treated within an hour or two, but they can cause pain and illness and may severely damage a bitten hand or foot. Although snakes do not always inject venom, all snakes may carry tetanus (lockjaw); therefore, anyone bitten by a snake, whether poisonous or nonpoisonous, should receive immediate medical attention.

One of the most important parts of treating a snakebite is identifying the type of snake making the bite. The type of **antivenim** used in medical treatment of snakebites varies depending on the type of venom injected. If you can identify the type of snake causing the injury, let Emergency Medical Services know when you call for help or phone the information ahead to the hospital if you plan to transport the victim yourself. If you cannot identify the snake, try to kill it without risk to yourself or delaying first aid; then show it to emergency medical personnel or take it to the hospital along with the victim for identification.

Key Note Term

antivenom – an antitoxin used to counter-act venom.

To treat snakebites, follow these steps:

1. **Get the victim away from the snake.**
2. **Reassure and keep the victim quiet and still. This will keep circulation to a minimum and keep the venom from spreading.**
3. **Immobilize the affected part in a position below the level of the heart.**

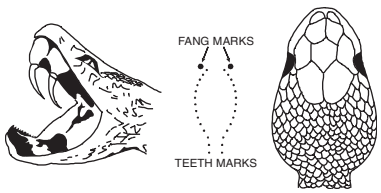


Figure 2.9.3: Poisonous snakebites leave characteristic bite patterns.

4. **Remove rings, bracelets, watches, and other jewelry from any affected limb. In case of swelling, this will make the victim more comfortable and will keep the affected limb from losing blood flow.**
5. **Wash the bite thoroughly with soap and water. Do not apply any ointments.**
6. **Place an icepack or freeze pack, if available, over the area of the bite. Do not place ice directly on the skin or wrap the limb with ice. You are only trying to cool the bite area, not freeze it.**
7. **For bites to the arms, legs, hands, or feet, apply constricting bands two to four inches away from the bite (see Figure 2.9.4). For an arm or leg bite, place one band above and one below the bite. For a hand or foot bite, place one band above the wrist or ankle. To ensure a band is not too tight, you should be able to insert a finger between the band and the skin.**
8. **If swelling from the bite reaches the band, tie another band a few inches farther away from the bite and the old band; then remove the old band.**
9. **Do not give the victim any food, alcohol, tobacco, medication, or drinks with caffeine.**
10. **Seek medical aid immediately.**

Prevention of Snakebites

Most snakes are shy and passive. Unless they are injured or disturbed, they tend to avoid contact with humans. You can prevent a snakebite by using caution and common sense. If you are working outside clearing dense undergrowth, wear gloves, long sleeves, long pants, and boots for protection. When hiking in the wilderness, wear boots and long pants. Try to walk in open areas or stay on established paths. Look where you are stepping or placing a hand if climbing or pushing away tree limbs. Check before sitting on a rock or fallen tree. If possible, stay away from brush, rocks, and undergrowth. If you must handle a snake, even a freshly killed one, use a long tool or stick.

Human and Animal Bites

Mouths of people and animals are full of bacteria, so human and animal bites that break the skin spread germs and may result in serious infection and disease.

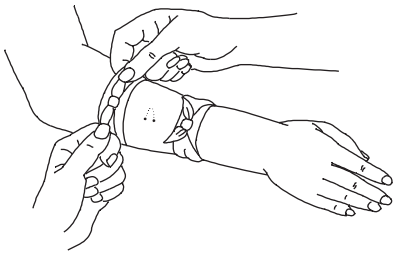


Figure 2.9.4: Place constricting bands on either side of the snakebite.

A person bitten by a diseased animal may come down with **tetanus**, **rabies**, and various types of fevers. If you think an animal is carrying a disease, notify the proper authorities to have it captured.

To treat a victim of an animal bite, follow these steps:

1. **If bleeding is severe, control it first before continuing with other first aid. Refer to the lesson on Controlling Bleeding for procedures to control bleeding.**
2. **Cleanse the wound thoroughly with soap or a detergent solution and water. Continue to cleanse and flush the wound with water for five minutes.**
3. **If there is minor bleeding, cover the wound with gauze or a clean cloth, press firmly on the wound, and if possible, raise the injury above the level of the victim's heart.**
4. **When minor bleeding stops, cover the wound with a sterile dressing and secure the dressing in place.**
5. **Immobilize an injured arm or leg.**
6. **Seek medical assistance as soon as possible.**

Insect Bites and Stings

In the outdoors, you may come in contact with various types of biting and stinging insects—bees, mosquitoes, ticks, fleas, spiders, and so on. Most of these insect bites and stings result in minor reactions, such as itching, redness, swelling, and irritation; however, scorpions and certain spiders can inject powerful poisons when they bite, and some people may have an **allergic reaction** to an insect bite or sting, particularly made by bees or wasps. In these cases, seek medical treatment immediately.

The black widow and brown recluse spiders, tarantulas, and scorpions, shown in Figure 2.9.5, are some of the more harmful insects you may encounter. Venom from the black widow is neurotoxic and may cause stomach and muscle cramps, breathing difficulties, nausea, sweating, vomiting, and convulsions. Tarantula venom is basically neurotoxic and may produce symptoms similar to that of a black widow bite, but in some cases can affect the heart and may digest tissue producing a severe local wound. The brown recluse spider can produce severe tissue damage around the bite, possibly leading to gangrene. Although stings from certain types of scorpions are painful but not dangerous, some can cause nausea, fever, stomach cramps, and possible convulsions and shock.

In most cases, bee and wasp stings produce minimal swelling, pain, redness, itching, and burning at the site of the sting. Multiple stings may cause headaches, fever, muscle cramps, and drowsiness. Symptoms from an allergic reaction may include:

- **Extreme pain at the site of the sting**
- **Itching and hives**
- **Weakness**

Key Note Term

tetanus – (also called lockjaw) an acute infectious disease caused by the poison of a certain bacterium that enters the body through a wound, resulting in muscle contractions, rigidity, and death; it is preventable by immunization.

rabies – a viral disease affecting the central nervous system of mammals that is transmitted by a bite from an infected animal; it can result in paralysis and death if left untreated.

allergic reaction – a physical reaction, often marked by sneezing, breathing difficulties, itching, rash, or swelling, that some people have when the come in contact with certain substances.

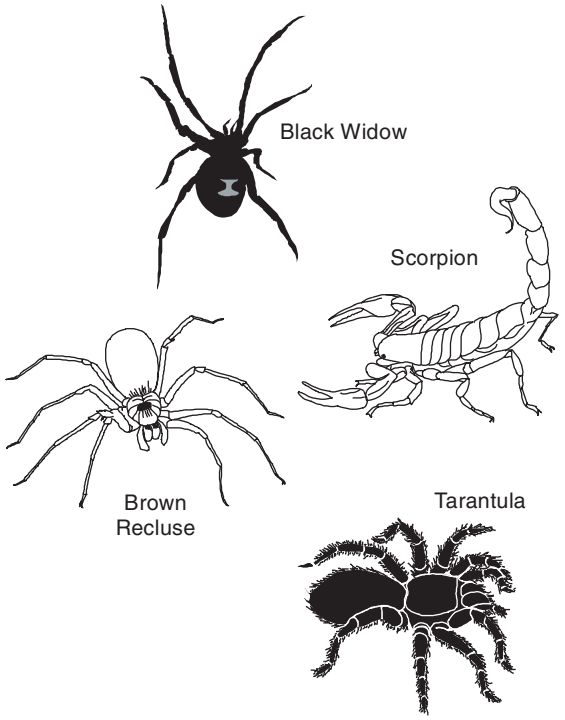


Figure 2.9.5: Some biting and stinging insects can cause serious health problems.

- **Anxiety**
- **Headache**
- **Breathing difficulties**
- **Nausea and vomiting**
- **Diarrhea**
- **Collapse, shock, and even death from a serious allergic reaction.**

Take the following basic first aid measures regardless of what caused the bite or sting:

1. **Remove any stinger left in the skin by scraping the skin's surface with a fingernail or knife. Do not squeeze the stinger because it may inject more venom.**
2. **For tick bites, remove the tick with your fingers if it will come off the skin easily. Do not pull the tick off if it will not come easily; this may leave the head of the tick in the skin which can cause infection. Instead, cover the tick with vaseline or thick oil to make it let go and then remove it.**
3. **Wash the area of the bite/sting with soap and water. Apply an antiseptic, if available, to minimize the chances for infection.**
4. **Use an icepack or cold compresses on the site of the bite/sting to help reduce swelling. Do not apply the ice directly to the skin.**
5. **Apply calamine lotion or a baking soda and water paste to the bite to relieve pain and itching.**
6. **Treat more serious allergic reactions as you would a snakebite.**
   - **Apply constricting bands above and below the site.**
   - **Be prepared to perform basic life-support measures.**

Key Note Term

calamine – a pink powder consisting of zinc oxide and some ferric oxide used in lotions and ointments.

- **To positively identify the insect, attempt to capture it without putting yourself at risk.**
- **Seek medical aid right away.**

7. **If signs of infection such as pus, red streaks leading away from the bite, swollen glands, or fever occur within hours or several days after an insect bite, seek medical attention.**

Prevention of Insect Bites and Stings

Wear insect repellent when outside in areas where biting insects are present. Reapply repellent every few hours when participating in activities that cause heavy perspiration. Wear appropriate protective clothing when hiking or camping in the wilderness or working in a yard, garden, or other woodsy or overgrown area.

Poisonous Plants

Most plants are harmless, but a few can cause allergic reactions upon contact (see Figure 2.9.6). For example, plants of the poison ivy group, including poison oak and poison sumac, produce an oily substance that irritates the skin of many people. Reactions to this substance include a rash characterized by redness, blisters, swelling, and intense burning and itching, as well as headaches and fever. Although the rash usually begins within a few hours after contact, it may appear 24 to 48 hours later.

In general, treat someone who has come in contact with a poisonous plant as follows:

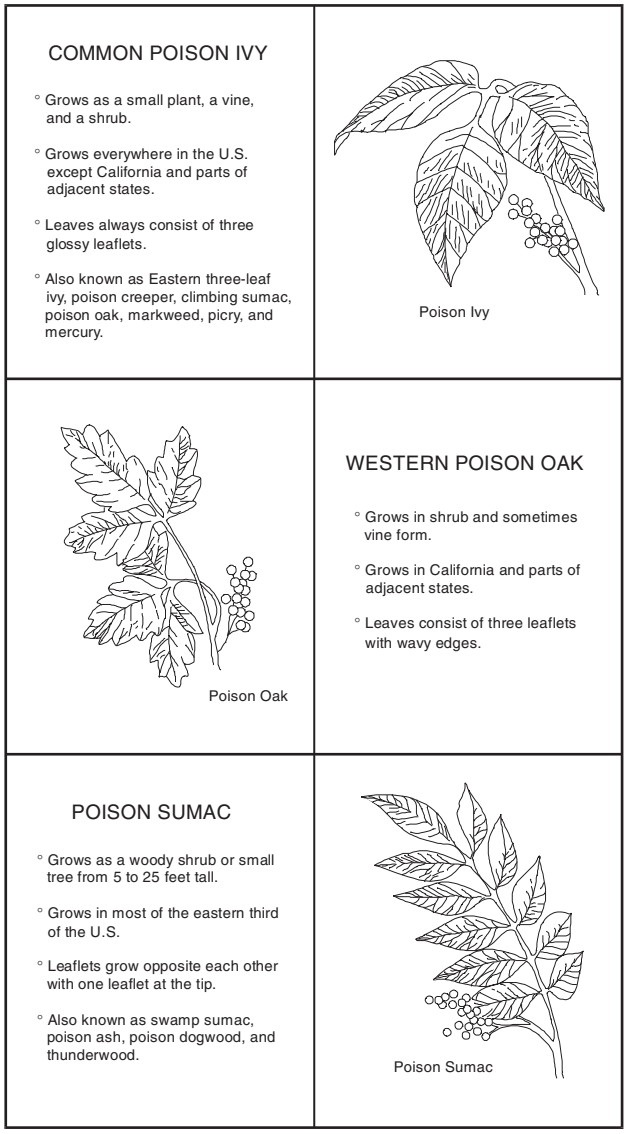
1. **Remove contaminated clothing. Set it aside to be washed.**
2. **Wash all exposed areas of the skin thoroughly with soap and water, then apply rubbing alcohol.**
3. **Apply calamine or other soothing skin lotion to relieve itching and burning. Avoid covering the rash with a dressing.**
4. **Seek medical treatment if a severe rash occurs, if the rash is on the face or mouth which may interfere with breathing, or if there is a known history of allergic reactions.**

Prevention of Exposure to Poisonous Plants

Become familiar with what poison ivy and other poisonous plants look like so you can recognize a poisonous plant and avoid contacting it. The following are other precautions you should take to limit your exposure to poisonous plants:

- **Dress appropriately when participating in outdoor activities.**
- **Avoid areas where you aware that poisonous plants grow.**
- **Do not eat plants or parts of plants that you do not recognize.**
- **Do not put grass, twigs, stems, or leaves in your mouth.**

Figure 2.9.6: Poison ivy, oak, and sumac can cause severe allergic reactions in some people.



Conclusion

Being able to adjust to new environments and protect yourself from harmful conditions is very important when participating in outdoor activities. Factors in nature such as extreme temperatures and humidity; animal, snake, and insect bites; and poisonous plants can pose a threat to you if you do not take precautions to guard against the possibility of injury. By being aware of potential hazards, knowing how to treat outdoor-related injuries, and exercising common sense, you can cope successfully with the environment and enjoy your time in the great outdoors.

Lesson Review

1. What are the three types of snake venom?
2. Why is it important to try and determine what type of snake caused the bite?
3. What are the symptoms of an allergic reaction to an insect bite or sting?
4. How would you treat someone who has come in contact with a poisonous plant?