

U.S. Department of Agriculture Natural Resources Conservation Service		1. WORK PROJECT/ACTIVITY Bites and Stings	2. LOCATION Boise, ID	3. UNIT Snow Survey
JOB HAZARD ANALYSIS (JHA)		4. NAME OF ANALYST Jeff Anderson	5. JOB TITLE Hydrologist	6. DATE PREPARED 2/14/2007
7. TASKS/ PROCEDURES	8. HAZARDS	9. ABATEMENT ACTIONS Engineering Controls * Substitution * Administrative Controls * PPE		
All readings in this JHA come from Wilderness First Aid – Emergency Care for Remote Locations 2nd Edition, Copyright 2005, Published by Jones and Bartlett				
Avoiding / Treating Animal Bites	Cuts, bruising, etc... Rabies – see p. 259-260	Read pages 258-261		
Avoiding / Treating Snake bites	Non-Venomous / Rattlesnakes / Coral Snakes –	Read pages 262-268		
Avoiding / Treating Spiderbites	Venomous Spider bites	Read pages 270-273		
Avoiding / Treating Tick Bites	<p>Lyme Disease. Within 3 days to several weeks, a ring-like rash develops in 60-80 percent of cases, along with flu-like symptoms that disappear even if not treated. A large red spot on the bite area; fever, chills, headache, joint and muscle ache, significant fatigue, and facial paralysis are reactions that may appear within two weeks of the attack. Symptoms specific to Lyme disease include: confusion, short-term memory loss, and disorientation. Within weeks to months, neurologic abnormalities, including meningitis, encephalitis, and cardiac abnormalities, may become chronic. Within 6 months to several years, joint and muscle pain and arthritis may occur in one or several joints.</p> <p>Rocky Mountain Spotted Fever. Within 2 to 14 days, sudden onset of headache, chills, fever, and general aches, reddish-purple-black spots appearing on the extremities and spreading to the trunk, neck, and face (80 percent of cases).</p> <p>Colorado Tick Fever. Sudden high fever, chills, fatigue, severe headache, and muscle aches.</p> <p>Tick Paralysis. Within 4 to 6 days, rapid paralysis starting in the extremities and extending to the face area.</p> <p>Tularemia. Chills, fever, loss of appetite, swollen lymph nodes, and ulcer at the wound site.</p> <p>Relapsing Fever. High fever, chills, and abdominal pain; these symptoms subside, only to reoccur at a later date.</p>	<p>Read pages 273 – 275</p> <p>A. Spray clothing with insect repellent as a barrier Repellents, such as diethyl metatoloamide (DEET), do not kill ticks. Some sprays do contain permethrin, which kill ticks on contact. Always follow the manufacturer's application instructions for insect repellents and treatments.</p> <p>B. Wear light colored clothing that fits tightly at the wrists, ankles, and waist.</p> <p>C. Each outer garment should overlap the one above it.</p> <p>D. Cover trouser legs with high socks or boots.</p> <p>E. Tuck in shirt tails.</p> <p>F. Search the body on a regular basis, especially hair and clothing; ticks generally do not attach for the first couple of hours.</p> <p>G. If a tick becomes attached, pull it by grasping it as close as possible to the point of attachment with tweezers or fingers and pull straight out with gentle pressure. Wash skin with soap and water then cleanse with rubbing alcohol. Place the tick in an empty container for later identification, if the victim should have a reaction. Record dates of exposure and removal.</p> <p>D. Do not try to remove the tick by burning with a match or covering it with chemical agents.</p> <p>G. If you can not remove the tick, or the head detaches, seek prompt medical help.</p> <p>H. Watch for warning signs of illness listed under hazards and seek medical attention.</p>		

<p>Avoiding / Treating Bee, Wasp, Yellow Jacket, etc... Stings</p>	<p>Allergic reactions, swelling, itching, difficulty breathing, pain</p>	<p>Read pages 275-277</p> <p>A. Be alert to hives in brush or in hollow logs. Watch for insects travelling in and out of one location. If such a feature is located flag the area so others avoid it. B. If you or anyone you are working with is known to have allergic reactions to bee stings, tell the rest of the crew and your supervisor. Make sure you carry emergency medication with you at all times and explain the use of an Epi-pen to co-workers. C. Wear long sleeve shirts and trousers; tuck in shirt.. Bright colors and metal objects may attract bees. D. If you are stung, cold compresses may bring relief. E. If a stinger is left behind, scratch off the skin. Do not use a tweezers as this squeezes the venom sack, worsening the injury. F. If the victim develops hives, asthmatic breathing, tissue swelling, or a drop in blood pressure, seek medical help immediately. Give victim antihistime, (Benadryl, chlo-amine tabs).</p>	
<p>Avoiding / Treating Mosquito Bites</p>	<p>Skin irritation</p> <p>West Nile Virus – Mosquitos can transmit the virus. Most people who get infected with West Nile virus do not have any symptoms. Some people develop a mild illness called West Nile Fever. This mild illness gets better on its own. No treatment is needed. A small number of people (less than 1 out of 100) who get infected with West Nile virus develop severe disease, called West Nile encephalitis or West Nile meningitis (inflammation of the brain or the area around the brain). This severe disease usually requires hospitalization. In some cases, especially among older persons, it can result in death. Symptoms of severe illness include headache, high fever, stiff neck, mental confusion, muscle weakness, tremors (shaking), convulsions, coma, and paralysis. See your doctor if you develop these symptoms. There is no specific treatment for the West Nile virus infection. People over age 50 have a higher risk for becoming seriously ill when they get infected with West Nile virus. People under age 50 can also become sick, but it is less likely.</p>	<p>A. Prevent mosquito bites by wearing light colored clothing with long sleeves and trousers. B. Avoid heavy scents C. Avoid being outside at dawn and dusk when mosquitos are more active. D. Use insect repellants with DEET. Follow manufacturers directions. Read p. 278. E. Carry after-bite medication, such as Sting-Eze to reduce skin irritation. F. If symptoms develop seek medical attention.</p> <p>For more information about West Nile Virus visit: http://www.cdc.gov/ncidod/dvbid/westnile/prevention_info.htm</p>	
<p>10. LINE OFFICER SIGNATURE</p>	<p>11. TITLE</p>	<p>12. DATE</p>	

Previous edition is obsolete

(over)

JHA Instructions

The JHA shall identify the location of the work project or activity, the name of employee(s) writing the JHA, the date(s) of development, and the name of the appropriate line officer approving it. The supervisor acknowledges that employees have read and understand the contents, have received the required training, and are qualified to perform the work project or activity.

Blocks 1, 2, 3, 4, 5, and 6: Self-explanatory.

Block 7: Identify all tasks and procedures associated with the work project or activity that have potential to cause injury or illness to personnel and damage to property or material. Include emergency evacuation procedures (EEP).

Block 8: Identify all known or suspect hazards associated with each respective task/procedure listed in block 7. For example:

- a. Research past accidents/incidents
- b. Research the Health and Safety Code literature.
- c. Discuss the work project/activity with participants
- d. Observe the work project/activity
- e. A combination of the above

Block 9: Identify appropriate actions to reduce or eliminate the hazards identified in block 8. Abatement measures listed below are in the order of the preferred abatement method:

- a. Engineering Controls (the most desirable method of abatement). For example, ergonomically designed tools, equipment, and furniture.
- b. Substitution. For example, switching to high flash point, non-toxic solvents.
- c. Administrative Controls. For example, limiting exposure by reducing the work schedule; establishing appropriate procedures and practices.
- d. PPE (least desirable method of abatement). For example, using hearing protection when working with or close to portable machines (chain saws, rock drills portable water pumps)
- e. A combination of the above.

Block 10: The JHA must be reviewed and approved by a line officer. Attach a copy of the JHA as justification for purchase orders when procuring PPE.

Blocks 11 and 12: Self-explanatory.

Emergency Evacuation Instructions

Work supervisors and crew members are responsible for developing and discussing field emergency evacuation procedures (EEP) and alternatives in the event a person(s) becomes seriously ill or injured at the worksite.

Be prepared to provide the following information:

- a. Nature of the accident or injury (avoid using victim's name).
- b. Type of assistance needed, if any (ground, air, or water evacuation)
- c. Location of accident or injury, best access route into the worksite (road name/number), identifiable ground/air landmarks.
- d. Radio frequency(s).
- e. Contact person.
- f. Local hazards to ground vehicles or aviation.
- g. Weather conditions (wind speed & direction, visibility, temp).
- h. Topography.
- i. Number of person(s) to be transported
- j. Estimated weight of passengers for air/water evacuation.

The items listed above serve only as guidelines for the development of emergency evacuation procedures.

JHA and Emergency Evacuation Procedures Acknowledgement

We, the undersigned work leader and crew members, acknowledge participation in the development of this JHA (as applicable) and accompanying emergency evacuation procedures. We have thoroughly discussed and understand the provisions of each of these documents:

SIGNATURE DATE

SIGNATURE DATE

THE OFFICIAL COLLABORATION BETWEEN:

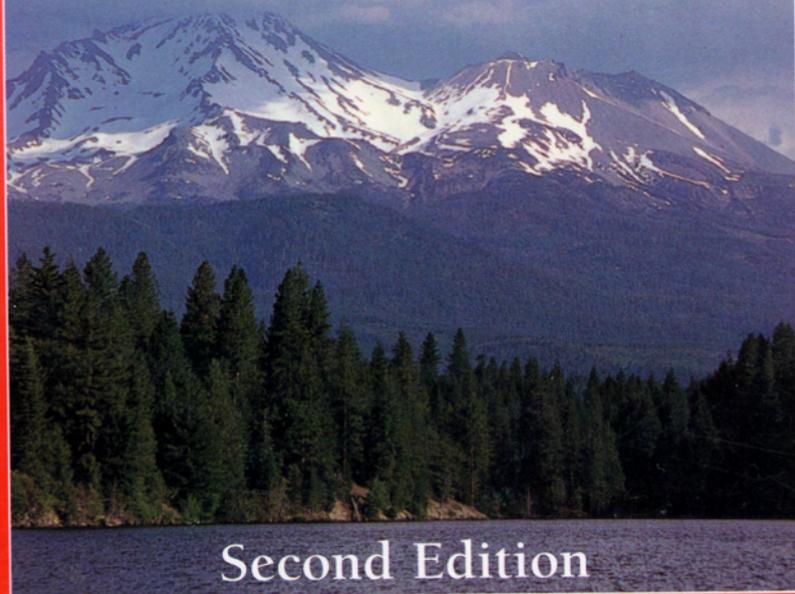


American Academy of
Orthopaedic Surgeons



Wilderness First Aid

EMERGENCY CARE
FOR REMOTE LOCATIONS



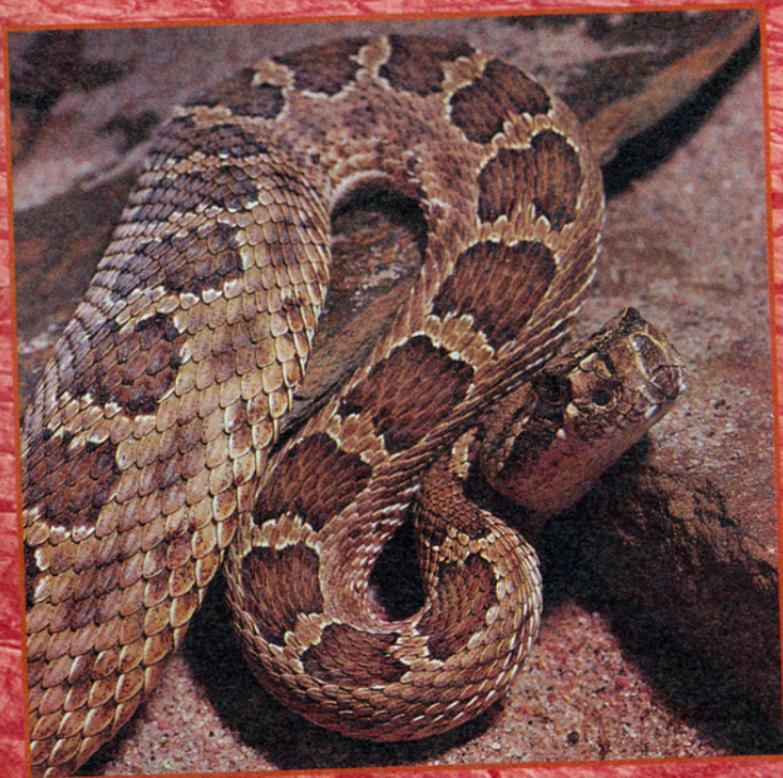
Second Edition

*"The definitive source for
wilderness first aid information."*

CHAPTER

17

Animal Bites, Human Bites, and Snakebites



Animal Attacks • Human Bites • Snakebites

The wilderness traveler is sure to encounter animals; the species will depend on the geography. The animals will vary in size and ferocity, but it is not only the large and obviously aggressive that present danger. A small, rabid skunk is far more dangerous than a placid grizzly bear that turns and runs at the first sign of a human scent.

The first aider should be aware of the animals likely to be seen, their appearance and identifying marks, their habits and habitats. An attacking animal may not remain in the area to be identified, and the victim may be too frightened to give a coherent account and description. If the animal is large and has horns or antlers, precise identification is not as important as the injuries suffered. If, however, the animal is potentially venomous, identification may be critical in deciding whether to evacuate the victim.

Animal Attacks

WILD ANIMALS

In Asia and Africa, attacks by elephants, hippos, lions, tigers, crocodiles, and snakes kill thousands of people every year. Snakebites alone cause 30,000 to 50,000 deaths per year in Asia, but fewer than 10 to 15 deaths per year in the United States.

In North America the wild animals most likely to attack humans are bears (both black and grizzly), bison, moose, cougars, and alligators. Not all injuries are bites. Severe injuries result from victims being thrown in the air, gored by antlers, butted, or trampled on the ground. Injuries include puncture wounds, bites, lacerations, bruises, fractures, rupture of internal organs, and evisceration. Many small animals such as squirrels and chipmunks bite people trying to feed them; these bites are seldom serious. (The dangers of infection and rabies are discussed below.)

DOMESTIC ANIMALS

Most animal bites in the United States are inflicted by dogs (4 million bites yearly) and by cats. Dog bites can be severe and sometimes lethal. The simple bites tend to be puncture wounds; more severe bites are tearing lacerations.

Cat bites should also be treated seriously. The fangs of a cat are short and sharp and inflict puncture wounds that frequently become infected. Most cat bites occur on the hands and may puncture tendons and joints.

What to Do

The principles of treatment are the same for injuries inflicted by domestic or wild animals.

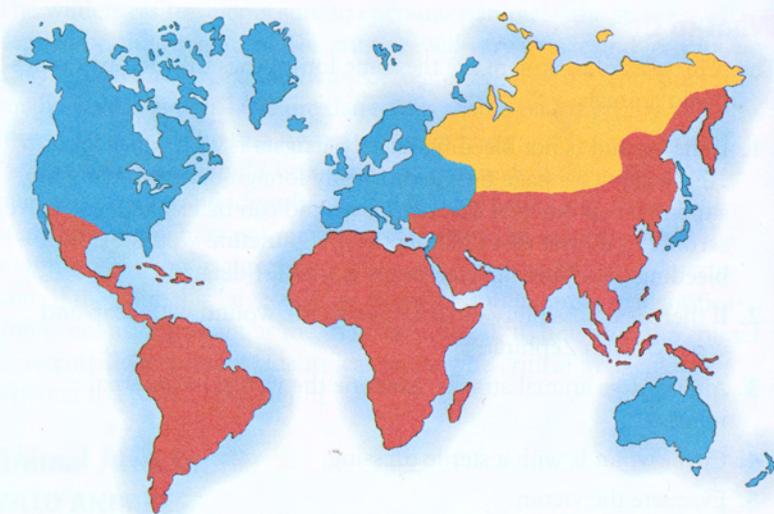
1. If the wound is not bleeding heavily, irrigate it with water for 5 to 10 minutes (see page 64). Remove any foreign material. Only the superficial entrance of a puncture wound can be cleaned; extensive scrubbing cannot clean the depths of a puncture wound. Control bleeding with pressure (see pages 60–62 for details).
2. If there is a possibility of rabies, wash the wound with soap and water or with Zephiran™.
3. After a large animal attacks, examine the victim for internal injuries.
4. Cover wounds with a sterile dressing.
5. Evacuate the victim.

RABIES

Rabies is a fatal viral infection of the brain that may follow the bite of a rabid animal. The disease only affects warm-blooded animals.



Dog bite, showing characteristic multiple bite marks



Rabies

■ Low risk	■ No information
■ High risk	

Most industrial, Western nations have effective control systems for domestic animals, but South and Central America, Africa, and Asia have poor controls and a high incidence of rabies in dogs. Some island countries, such as Britain and New Zealand, have eliminated rabies through strict quarantine regulations.

In North America, strict rabies control programs in domestic animals have made the disease rare. The reservoir of rabies in wild animals, however, remains large. Animals most commonly infected are skunks, raccoons, and bats. Foxes are occasionally found to be rabid, but rodents only rarely. In 1990 only 148 domestic dogs in the United States were found to be infected.

Rabies is found in all climates but not in all countries. There are thousands of cases per year in many countries, but in the United States there have been fewer than four human cases per year since 1980. All cases resulted from dog and bat bites, and the victims were mostly bitten outside the United States but developed rabies after returning home.

Consider rabies possible:

- In an area or country where rabies is endemic
- If a bite by a dog, cat, skunk, raccoon, or fox is unprovoked and the skin is broken

- If bitten by a bat
- If bitten by a large carnivore
- If an already open wound or abrasion is licked by a potentially rabid animal

Rabies vaccines and serum are effective even if given after exposure. The sooner antirabies serum is given after a bite the better the chance of recovery. As there is no other treatment, the correct management after exposure is very important.

What to Do

1. The victim:

- Wash the bite vigorously with a strong solution of soap and water or irrigate the bite marks with Zephiran™. Iodine solutions are not as effective, but in the absence of other agents use a diluted solution of Betadine™ (10% diluted to 1%).

2. The animal:

The brain of an infected animal must be examined to make an exact diagnosis. Therefore it may be necessary to capture or kill the animal.

- *Domestic animals:* Report the incident to the local health and animal control authorities. The animal will then be kept for 10 days to see if signs of rabies become obvious.
- *Wild animals:* It may be difficult or impossible to capture a wild animal. Kill or capture the animal only if feasible without risk of being bitten. Deliver the body to the local health authority for diagnostic examination.



DO NOT

- try to capture the animal yourself.
- approach the animal.
- kill the animal unless it is wild and likely to escape. If it is killed, protect the head and brain from damage for examination for rabies. Transport the dead animal intact to prevent exposure to potentially infected tissues or saliva. Refrigerate, but do not freeze, animal remains.

PREVENTION

Preventive immunization is recommended for veterinarians, zoologists, and biologists who handle wild animals.

- Bats are a common reservoir of rabies. Spelunkers who explore caves heavily occupied by bats should be immunized.
- In countries where rabies is common, travelers should take great care in approaching village dogs or cats, monkeys, or any wild animals.

Human Bites

Any contact between the teeth and saliva of one human that causes an open wound on another is, technically, a bite (e.g., a hand injury caused by hitting another person's teeth during a fist fight is a bite). Wound infections are more common after human bites than animal bites.

What to Do

1. Wash the wound with soap and water for 5 to 10 minutes. Rinse liberally with water.
2. Control bleeding with pressure (see pages 60–62).
3. Cover with a sterile dressing.
4. Seek medical care and tetanus immunization, if needed.

Snakebites

This section deals only with snakes found in North America. Travelers to other areas should consult appropriate authorities for local information.

Only two snake families in the United States are poisonous: *pit vipers* (rattlesnakes, copperheads, and water moccasins) and *coral snakes*.

Pit vipers have a triangular, flat head, wider than the neck; vertical, elliptical pupils (“cat’s eye”); and a heat-sensitive “pit” located between the eye and nostril.

The coral snake is small and very colorful, with a series of bright red, yellow, and black bands that go all the way around its body. Every alternate band is yellow, and the snout is black. The color banding is similar to that of the nonvenomous king snake, but when in doubt, remember: “RED ON YELLOW, KILL A FELLOW; RED ON BLACK, VENOM LACK.”

The venom of young snakes is as toxic as that of adults, but the larger volume injected by adults usually causes a more severe reaction.



Distribution of poisonous snakes in the United States

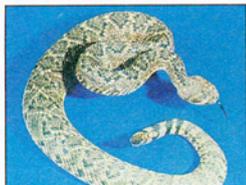
PIT VIPER SNAKEBITE

Rattlesnakes inflict about 65 percent of all venomous snakebites and cause nearly all snakebite deaths in the United States. There are fewer than 15 snakebite deaths per year in the United States.

Twenty-five percent of rattlesnake bites are “dry”; no venom is injected. There may be a fang mark, but no local or systemic symptoms.

What to Look For

- Severe burning pain at the bite site
- Two small puncture wounds about 1/4" to 1/2" apart (some cases may have only one fang mark). If the snake has struck several times, there may be more than two fang marks.
- Swelling, starting within 5 minutes and progressing up the extremity in the next hour. Swelling may continue to advance up the limb for several hours.
- Discoloration and blood-filled blisters developing in 6 to 48 hours
- In severe cases: nausea, vomiting, sweating, weakness, bleeding, coma, and death



Rattlesnake



Rattlesnake bite (note two fang marks)



Copperhead snake



Copperhead bite two hours after bite



Coral snake, America's most venomous snake



Watermoccasin (cottonmouth)

What to Do

Most snakebites happen within a few hours of a medical facility where antivenin is available. Bites without signs of venom injection require only a tetanus shot and care of the bite wounds.

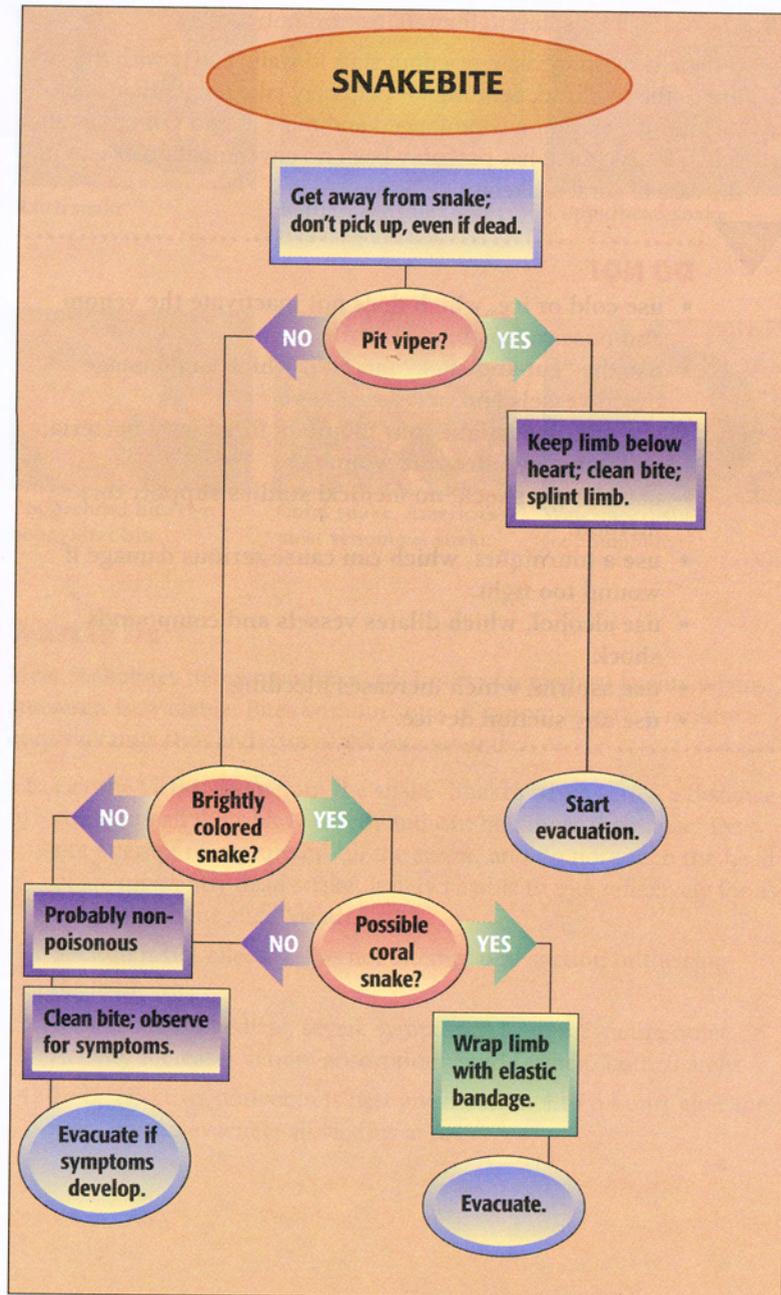
1. Get the victim away from the snake. Snakes strike across a distance equal to half their body length and can bite more than once. Do not attempt to capture or kill the snake, and do not touch the head of an apparently dead snake: it may be able to bite reflexively for as long as an hour after "death."
2. Suction is not effective. Do not attempt oral suction or incising the skin.
3. If there are immediate, severe symptoms, keep the victim quiet. Activity increases venom absorption. Send for help immediately.
4. To be effective, antivenin is best given within 4 to 6 hours after the bite. Start to evacuate all victims at once.

5. Use a sling or a splint to immobilize the limb loosely.
6. If there is no immediate reaction, start to walk slowly with the victim to the trailhead. Sending for help may take longer than walking out. If evacuation is prolonged and there are no symptoms after 6 to 8 hours, there has probably been no envenomation except in the case of coral snakebite.



DO NOT

- use cold or ice, which does not inactivate the venom and poses a frostbite hazard.
- use the "cut-and-suck" method, which can damage blood vessels and nerves.
- use mouth suction; your mouth is filled with bacteria, and you may infect the wound.
- use electric shock; no medical studies support this method.
- use a tourniquet, which can cause serious damage if wound too tight.
- use alcohol, which dilates vessels and compounds shock.
- use aspirin, which increases bleeding.
- use any suction device.



Do not incise a snakebite.

CORAL SNAKEBITE

The coral snake is America's most venomous snake, but it rarely bites humans. It is nocturnal and not aggressive. Its fangs are short, and it tends to hang on and "chew" venom into the victim rather than strike and release like a pit viper.

What to Look For

- Local, immediate signs are minimal. The absence of immediate symptoms is *not* evidence of a harmless bite. Several hours may pass before the onset of respiratory depression, double vision, or difficulty in swallowing.

What to Do

1. Keep the victim calm.
2. Clean the bite with soap and water.
3. Wrap with an elastic bandage by starting at the bite and along the length of the arm or leg and back again to the bite.
4. Evacuate to hospital for antivenin.

NONPOISONOUS SNAKEBITE

Nonpoisonous snakes may leave toothmarks in a horseshoe shape on the victim's skin. There may be some swelling and tenderness but no evidence of significant envenomation.

What to Do

1. Clean the bite with soap and water.
2. Care for the bite as a minor wound.
3. Seek medical care; a tetanus booster may be needed.

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- Most snakes are nocturnal and hide from the heat in the middle of the day. At night, carry a flashlight and watch where you step.
- During the day, do not step into places where you cannot see; do not reach up to ledges or put your hands down holes. Wear high boots. If you see a snake, do not try to catch or kill it. Stand still and let it move away.
- If someone has been bitten, try and get one good look at the snake, then leave it alone—avoid having two victims to evacuate.

CHAPTER**18****Insect and Arthropod
Bites and Stings**

Spider Bites • Scorpion Stings • Centipede Bites •
Tick Bites • Insect Stings • Insect Repellents

Wilderness travelers generally worry about “bugs” and take precautions to avoid being bitten. Most bites and stings are merely annoying; others, such as the bites of some ticks and the sting of an *Anopheles* mosquito, may give rise to dangerous disease.

This chapter deals with the more common bites and stings that occur in North America and does not deal with the dozens of species in other countries around the world that give painful or sometimes lethal bites. Travelers going beyond North America should become familiar with the local insects and the diseases they carry. Information is available from state health departments or the Centers for Disease Control (see page 9).

Spider Bites

Many spiders are venomous, but few have either venom that is dangerous to humans or fangs long enough to penetrate human skin. Exceptions in North America include the black widow, brown recluse, hobo spider, and tarantula. Death from spider bite is rare in North America.

BLACK WIDOW SPIDER

The black widow spider is found throughout the world. Only the female is dangerous; she has a glossy black body with a red spot (often in the shape of an hourglass) on the abdomen. Identification of a black widow spider bite is difficult because most likely the spider will not be seen.



Black widow spider

What to Look For

- A sharp pinprick may be felt, although some victims are unaware of being bitten; no mark may be visible.
- Faint red bite marks, which appear later
- Muscle stiffness and cramps, affecting the bitten limb and ascending to the abdomen and thorax
- Headache, chills, fever, heavy sweating, dizziness, nausea, vomiting, and severe abdominal pain occurring later

What to Do

1. If possible, catch the spider for identification. Save the body, even if it is crushed.
2. Clean the bitten area with soap and water.

3. Relieve pain, which may be severe, with an ice pack on the bite. Administer pain medication orally.
4. Check the ABCs.
5. Seek medical attention immediately. Antivenin is available but is usually given only to children, the elderly, those with high blood pressure, pregnant women, or after severe envenomation.

BROWN RECLUSE SPIDER

The brown recluse is a nondescript spider with a brown, sometimes purplish, violin-shaped figure on its back. It is generally found in the southern United States but has been identified as far north as Wisconsin.



Brown recluse spider

The brown northwestern hobo spider can be mistaken for the brown recluse; it is similar in appearance but does not have a “violin” marking. Its bite can be painful but not as dangerous as that of the brown recluse. The two spiders are found in widely separate geographic locations. Find out which spiders are located in your travel area. The brown recluse should not be implicated just from an initial skin lesion. Other spiders and even some insect bites can result in a large area of redness with a central blister or small ulcer.

What to Look For

- During the early stages, a bite with a bull’s-eye appearance—a central white core surrounded by red, ringed by a whitish or blue border. A blister at the site, along with redness and swelling, appears several hours after the bite.
- Local pain, which may remain mild but can become severe. It then subsides, to be replaced by aching and itching.
- Fever, weakness, vomiting, joint pain, and a rash



Bite of brown recluse spider showing target pattern

What to Do

1. Clean the bite with soap and water.
2. Relieve pain with an ice pack on the bite; give pain medication.
3. There is no immediate danger. Later, large areas of inflammation may develop. If this happens, seek medical attention promptly.
4. Capture or kill the spider for identification.

TARANTULA

The North American variety of this large, hairy spider has a frightening appearance but is almost always harmless. There is moderate pain at the bite but few later symptoms. In some areas other than North America, tarantulas are dangerous. Know the local species.



Tarantula

What to Do

1. Clean the bite with soap and water.
2. Relieve pain with an ice pack.
3. Evacuate the victim if the species is known to be dangerous.

Scorpion Stings

Scorpions are found worldwide in desert and semiarid regions. Dangerous species exist in both hemispheres. In the southwestern United States, the bark scorpion is potentially lethal to small children and the elderly in poor health. Be aware of its appearance and distribution.



Scorpion

Scorpions look like miniature lobsters; they have pincers and a long upturned tail with a poisonous stinger. The sting causes immediate local pain and burning, followed by numbness or tingling. Symptoms include paralysis, muscle spasms, or breathing difficulties.

What to Look For

- Instant local pain and burning (all bites)
- Blurred vision, difficulty swallowing, slurred speech, numbness and tingling, occasional paralysis, muscle spasms, and breathing difficulties (severe bites)

- Jerking and twitching (similar to a seizure)
- More severe symptoms in children than adults

What to Do

1. Check the ABCs.
2. Clean the bite site with soap and water.
3. Put an ice pack on the sting to relieve pain.
4. Evacuate the victim as soon as possible. Antivenin for bark scorpion bite is available only in Arizona. It is used only for severe envenomation in small children and the elderly.

Centipede Bites

Centipedes have small fangs and venom glands. If the fangs are long enough to penetrate skin there can be local envenomation. Burning pain, swelling, and redness may last up to three weeks.

What to Do

1. Most bites will get better without treatment. If symptoms persist, try administering antihistamines by mouth or applying hydrocortisone ointment on the bite.

Tick Bites

Tick bites are painless, and a tick can remain attached for days without the victim being aware of its presence. Some ticks can transmit serious diseases (including Lyme disease, Rocky Mountain spotted fever, and tick paralysis), but most tick bites are harmless.

**DO NOT**

- use petroleum jelly, fingernail polish, rubbing alcohol, a hot match, petroleum products, or gasoline to remove ticks. They are ineffective.

What to Do

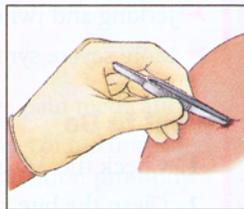
Ticks are difficult to remove because they secrete a cement that anchors them to the skin. Improper or partial removal can lead to local infection.



Tick embedded and engorged with victim's blood



Tick embedded



Removing a tick with tweezers

1. Remove the tick using one of these methods:
 - Tweezers (specially designed tweezers are available)
 - Commercial tick removal device
2. Grasp the tick close to the skin surface and pull steadily; or lift the tick slightly upward, then pull parallel to the skin until the tick detaches. If the head is still embedded in the skin, remove it with a needle as you would a splinter.
3. Wash the bite with soap and water.
4. If removal of the tick was painful, put an ice pack on the bite.
5. Watch for signs of local infection or unexplained symptoms of tick-borne illness (severe headache, fever, or rash) appearing 3 to 30 days after discovery of the tick. If symptoms appear, seek medical attention immediately.

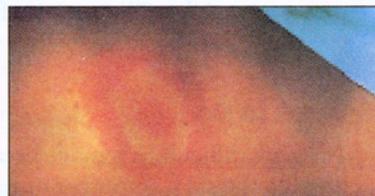


DO NOT

- grab the rear of the tick; the gut may rupture and the contents be squeezed out, causing infection.
- twist or jerk the tick. This may cause incomplete removal.



Deer ticks: not engorged and blood engorged



Lyme disease rash

LYME DISEASE

Lyme disease, a potentially serious tick-borne infection, affects the joints, skin, heart, and nervous system. The disease is caused by a corkscrew-shaped bacterium, or spirochaete, that is transported by ticks from deer and mice to humans. In the northeastern United States, the deer tick is the main carrier; in the west it is the black-legged tick.

Most infections are transmitted by the nymph form of the tick, which is about as big as a period (.) and difficult to see. Only 20% of infections are transmitted by adult ticks. The tick may have to be attached for 24 hours before transmitting infection; the longer a tick is attached, the greater the chance of infection.

Most victims of Lyme disease do not remember being bitten by a tick, because the disease may not become manifest until several weeks after the victim returns home.

What to Look For

- In early stages: distinctive rash (3 days to 1 month), fatigue, fever, chills, weakness, headaches, stiff necks, muscle or joint pains
- In later stages: one-sided paralysis, arthritis, meningitis, nerve or heart damage

What to Do

1. If any symptoms develop within a month of a tick bite, consult a doctor. Antibiotic treatment is usually curative, but is not necessary after every tick bite.

PREVENTION

- Wear long trousers tucked into socks during early summer tick season and when walking through long grass and infested areas.
- Spray clothing with permethrin insect repellent (see page 278).
- After hiking in tick-infested areas, inspect the *whole* body for ticks.

Insect Stings

More people die every year in the United States from bee, hornet, and wasp stings than from snakebites. The common stinging insects are the honeybee, bumblebee, yellow jacket, wasp, and fire ant. A single sting to

a severely allergic person may be fatal within minutes to an hour. Many people who die have had no previous history of severe reactions to stings. Multiple stings can kill, whether or not the person is allergic to stinging insects. Massive, multiple stings are rare, but with the entrance into the United States of Africanized “killer” bees from South and Central America, multiple-sting cases are likely to increase. The venom of these bees is no more potent than that of the European type; however, killer bees earned their nickname with their aggressiveness and swarming attacks.

What to Look For

The sooner symptoms develop after the sting, the more serious the reaction.

- ▶ *Local reactions:* brief pain, redness and swelling around the sting site, itching, and heat
- ▶ *Generalized reactions:* diffuse skin redness, hives, localized swelling of lips or tongue, “tickle” in throat, wheezing, abdominal cramps, diarrhea
- ▶ *Life-threatening reactions:* inability to breathe due to swelling of the air passages and throat, bluish or gray skin color, seizures, unconsciousness
- ▶ The responses of victims vary. One sting is not necessarily equivalent to another, even within the same species, because the amount of venom injected varies from sting to sting.
- ▶ Stings to the mouth or eyes are more dangerous than stings to other body areas. The most dangerous stings in nonallergic individuals are those inside the throat, from accidentally swallowing an insect. Swelling in the airway—though not an allergic reaction—can cause serious obstruction to breathing.

What to Do

1. Look for a stinger embedded in the skin (Only the honeybee leaves its stinger embedded.) Stingers, unless removed, can continue to inject venom for 2 or 3 minutes. Scrape the stinger and venom sac off the skin with a knife blade, but avoid pressing on them.

DO NOT

- pull the stinger with tweezers or fingers because you may squeeze more venom into the victim from the attached venom site.

2. Wash the sting site with soap and water.
3. Apply cold to the sting site for 15 to 20 minutes to relieve pain.
4. To relieve pain and itching, give a mild analgesic (e.g., acetaminophen, ibuprofen) or use a topical medication such as Secta Sooth Sting Relief Swab™ or Sting Eze™. Hydrocortisone cream and antihistamine pills reduce local symptoms.
5. Observe victims for at least 60 minutes for signs of a serious allergic reaction (see chapter 13).
6. A large local reaction does not require epinephrine and does not indicate a risk of serious reaction after future stings. If the victim develops hives or redness and swelling all over the body and difficulty breathing, immediately administer epinephrine if available.

PREVENTION

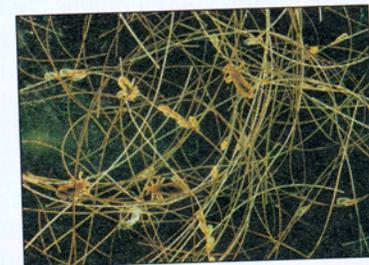
Do not approach or disturb wasp, bee, and ant nests. Do not walk in grass with bare feet. Choose campsites with care.

Those who have had a serious reaction to an insect sting should carry with them at all times a kit with self-injectable epinephrine, wear a medical-alert bracelet/necklace identifying them as allergic to insect stings, and see an allergist for desensitization.

LICE

Lice are small parasites that live on clothes, hair, or skin and drink blood. There are three types: head lice, pubic lice, and body lice. Body lice live on clothing, while head lice and pubic lice attach themselves to the hair shafts. All cause itching.

Lice are passed from person to person by direct contact or through clothes, bedding, hats, or hairbrushes. Pubic lice are most likely passed by sexual contact. Head lice are very common among schoolchildren. Body lice usually accompany poor hygiene. Lice do not live outdoors in the wild, and lice discovered on a trip usually would have been brought from home or picked up in a dwelling. Lice live only 2 to 3 weeks off the body on clothes and sleeping bags.



Head lice

What to Do

1. Treat with nonprescription lice shampoo or lotion containing permethrin (NixTM), pyrethrins with piperonyl butoxide (RIDTM), or lindane (KwellTM).
2. Wash clothes, sleeping bags, pillowcases, or other bedding in hot water.
3. Do not share clothes or hairbrushes.

Insect Repellents

Chemical repellents include natural repellents (citronella, lemon eucalyptus); synthetic repellents (DEET, dimethylthaltate); and insecticides (permethrin, deltamethrin, alphasmethrin).

Citronella (Avon Skin-So-SoftTM) and lemon eucalyptus provide 1 to 2 hours of protection. They are safe but not very effective and not recommended where serious protection is needed.

DEET (diethylmetatoluamide) is the most widely used repellent. Allergic reactions can occur when DEET is applied to the skin in high concentrations; it should not be used in concentrations greater than 35%. Although higher concentrations provide longer protection, new formulations have prolonged effect at lower concentrations. Some of the chemical is absorbed through the skin, and toxic reactions have been reported in small children. To avoid toxic effects, avoid the lips, eyes, and broken skin. Do not use DEET on infants. In children, especially, use low concentrations (10%) applied more frequently rather than high concentrations applied infrequently. DEET can be applied to clothing but may damage some synthetics, including polyesters.

Permethrin is an effective repellent against ticks, chiggers, mosquitoes, fleas, and sand flies. It should be applied only to clothing, not to the skin. Clothing, sleeping nets, or tents can be impregnated with permethrin by spraying or soaking in a solution. It does not stain, discolor, or degrade fabrics or plastics and maintains effectiveness on fabrics for weeks to months, even persisting through multiple washings.

In areas with mosquito-borne diseases, a permethrin-impregnated sleeping net is important protection. In addition, the traveler should wear long-sleeved shirts and long pants during dusk and dawn, when mosquitoes are most active. The combination of DEET on skin and permethrin on clothing provides maximum protection.