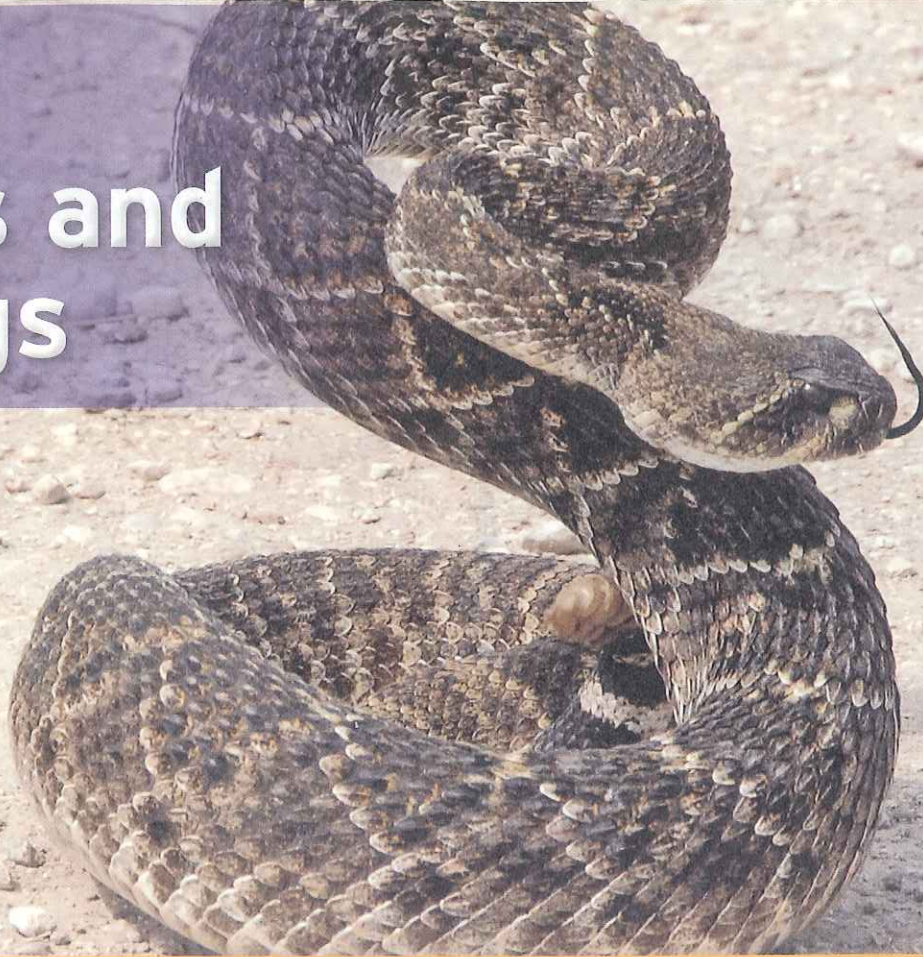


Bites and Stings

16



► Animal Bites

It is estimated that one of every two Americans will be bitten at some time by an animal or by another person. Dogs are responsible for about 80% of all animal bite injuries **Figure 1**. Of the nearly 5 million dog bites that occur yearly, 80% are trivial or minor, and medical care is not required or sought, which demonstrates the importance of knowing first aid. The remainder account for about 1% of all emergency department and physician office visits. Each year, about 19 bite-related deaths occur in the United States **Table 1**.

Animal bites represent a major, largely unrecognized public health problem. Two concerns result from an animal bite: immediate tissue damage and later infection from microorganisms. A dog's mouth can carry more than 60 species of bacteria, some of which are dangerous to humans. Two examples of infection—tetanus and rabies—have been almost eradicated by medical advances, but they still pose a potential problem.

Although cat bites are less mutilating than dog bites, cat bites have a much higher rate of infection than dog bites. Cats have very sharp teeth, which can create deep puncture wounds and involve muscle, tendon, and bone.

Besides children, elderly people and people unable to help themselves are especially prone to animal bites because they are sometimes unable to detect or prevent a dangerous situation. Many animal-related deaths occur when the victim is left alone with the offending pet. Contrary to popular belief, wild or stray dogs seldom are involved in fatal attacks.

chapter *at a glance*

- **Animal Bites**
- **Snake Bites**
- **Insect Stings**
- **Spider and Insect Bites**
- **Marine Animal Injuries**



Figure 1

Dog bite.

Damage mostly occurs on the hands, arms, legs, and face. A damaged face presents several problems because the proximity of blood vessels to the skin surface makes it susceptible to copious bleeding. Facial disfigurement and scarring can result in emotional trauma. Complete or partial loss of an eye also is possible.

Wild animal attacks occur most often in rural or wilderness locations. Not all injuries are bites. Severe injuries result from victims being thrown in the air, gored by an antler, butted, or trampled on the ground.

Rabies

Rabies is one of the most ancient and feared of diseases. Although human rabies rarely occurs in the United States or in other industrialized nations, it remains a scourge in developing countries. A virus found in warm-blooded animals causes rabies, which spreads from one animal to another in the saliva, usually through a bite or by licking. Bites from cold-blooded animals such as reptiles do not carry the danger of rabies.

A bite or a scratch is considered a significant rabies exposure if it penetrates the skin. Unprovoked attacks are more likely to have been inflicted by a rabid animal than are provoked attacks. Nonbite exposure consists of contamination of wounds, including scratches, abrasions, and weeping skin rashes.

Consider an animal as possibly rabid if any of the following applies:

- The animal made an unprovoked attack.
- The animal acted strangely, that is, out of character (for example, a usually friendly dog

Table 1 Animal-Related Human Deaths in the United States (1991-2001)

Animal	Average number of deaths each year
Venomous animals	
Snake	5.2
Spider	6
Scorpion	.045
Hornet, bee, wasp	48.5
Centipede	0.45
Other specified venomous arthropod	6
Venomous marine animal	0.18
Other specified venomous animal	2.1
Total venomous	68.88
Nonvenomous animals	
Dog	18.9
Rat	0.27
Nonvenomous snake	0
Other animals except arthropod	4
Other specified animal*	76.9
Unspecified animal	4
Total nonvenomous	104.07
Overall total	172.95

*Note that this category includes bitten or struck by other mammals, contact with marine animal, bitten or stung by nonvenomous insect or other nonvenomous arthropods, bitten or struck by crocodile or alligator, bitten or confronted by other reptiles.

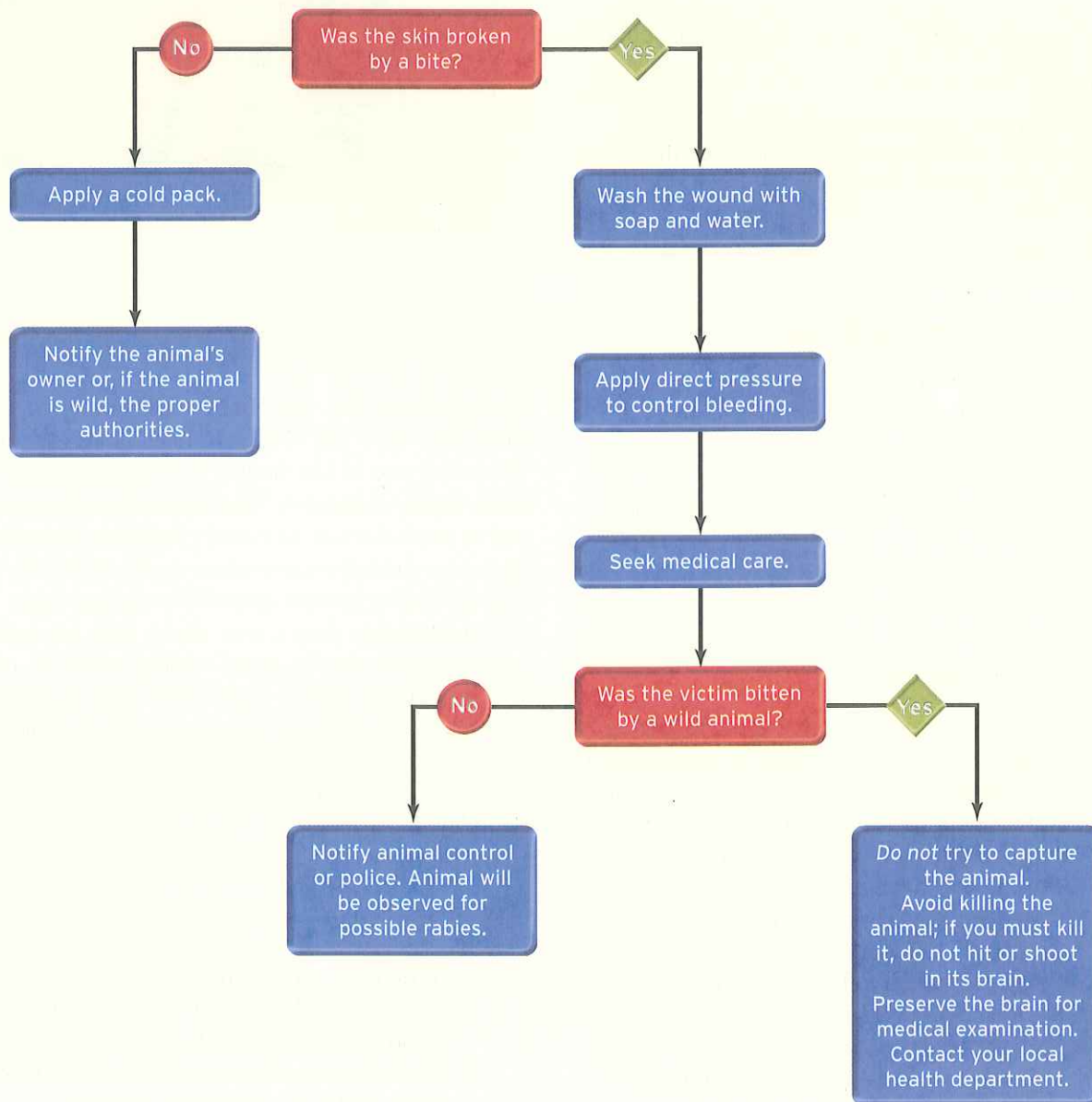
Source: Adapted from Langley RL. 2005. Animal-related fatalities in the United States: An update. *Wilderness Environ Med* 16(2):67-74.

is aggressive, or a wild fox seems docile and friendly).

- The animal was a high-risk species (skunk, raccoon, or bat).

Report animal bites to the police or animal control officers; they should be the ones to capture the animal for observation. If a healthy domestic dog or cat up to date with its rabies vaccination bit the victim, the animal should be confined and observed for 10 days for any illness. If a wild animal bit the victim, it should be considered a possible rabies exposure and medical care should be sought immediately.

Animal Bites



CAUTION

DO NOT try to capture the animal yourself.

DO NOT get near the animal.

DO NOT kill the animal unless absolutely necessary. If it must be killed, protect the head and brain from damage so they can be examined for rabies. Transport a dead animal intact to limit exposure to potentially infected tissues or saliva. The animal's remains should be refrigerated to prevent decomposition.

DO NOT handle the animal without taking appropriate precautions. Infected saliva might be on the animal's fur, so wear heavy gloves or use a shovel if you have to move a dead animal.

Recognizing Animal Bites

An animal bite has the following characteristics:

- Puncture wound from animal's sharp, pointed teeth
- Tissue and skin can be crushed
- Open wound on fingers, knuckles, and/or hand

It is important to be cautious when dealing with animal bites because the animal may still be nearby.

Care for Animal Bites

Help an animal bite victim by doing the following:

1. If the wound is not bleeding heavily, wash it with soap and water. Flush the wound with water under pressure from a faucet. Avoid scrubbing, which can bruise the tissues.
2. Control the bleeding with direct pressure.
3. Cover the wound with a sterile or clean dressing. Do not close the wound because doing so could trap bacteria, which increases the chances of infection.
4. Seek medical care for further wound cleaning and closure, and possible tetanus or rabies care.

Human Bites

After dogs and cats, the animal most likely to bite humans is another human. Human bites can cause severe injury, often more so than other animal bites. The human mouth contains a wide range of bacteria and viruses, so the chance of infection is great from a human bite, especially on the hand **Figure 2**.



Figure 2

Human bites can result in serious, spreading infection.

Recognizing Human Bites

There are two types of human bites. True bites occur when any part of the body's flesh is caught between teeth, usually deliberately. True bites happen during fights and in cases of abuse. Mandatory reporting laws apply if spousal or child abuse is involved. A schoolyard bite, with one child biting another, generally is not reportable.

Much worse than a true bite is the clenched-fist injury, which results from cutting a fist on teeth. It is associated with a high likelihood of infection. The injury is usually a laceration over the knuckles. Although clenched-fist injuries usually result from a fight, unintentional injury can happen during sports and play.

Care for Human Bites

Help someone with a human bite in the following manner:

1. If the wound is not bleeding heavily, wash it with soap and water for 5 to 10 minutes. Avoid scrubbing, which can bruise tissues.
2. Flush the wound thoroughly with running water under pressure from a faucet.
3. Control bleeding with direct pressure.
4. Cover the wound with a sterile dressing. Do not close the wound with tape or butterfly bandages. Closing the wound traps bacteria in the wound, increasing the chance of infection.
5. Seek medical care for possible further wound cleaning, a possible tetanus shot, and sutures to close the wound, if needed.

► Snake Bites

Throughout the world, about 50,000 people die of snake bites each year. Each year in the United States, 40,000 to 50,000 people are bitten by snakes, 7,000 to 8,000 of them by venomous snakes **Figure 3**.

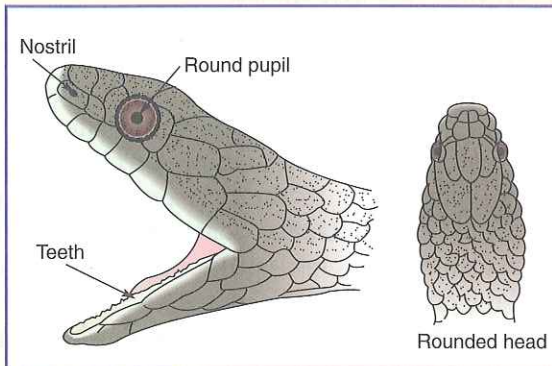
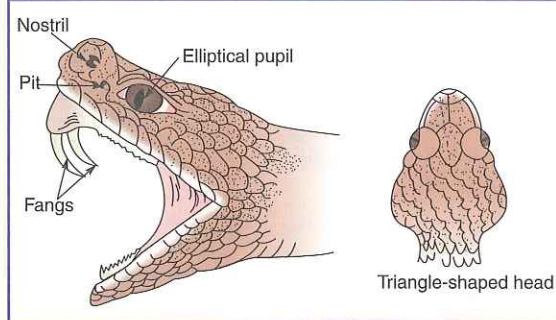


Figure 3

Characteristic features of venomous snakes (pit vipers) and of harmless snakes.

Victims who die of snake bites in the United States usually do so during the first 48 hours after the bite. Only four snake species in the United States are venomous: rattlesnakes (which account for about 65% of all venomous snake bites and nearly all the snake bite deaths in the United States), copperheads, water moccasins (also known as cottonmouths), and coral snakes **Figure 4**, **Figure 5**, **Figure 6**, and **Figure 7**. Although uncommon, snake bites can be painful, costly, and potentially deadly. Other than death, disabilities such as partial or complete loss of an extremity or finger or loss of movement in a joint can occur. Most victims fully recover.



Figure 5

Copperhead snake.



Figure 4

Rattlesnake.

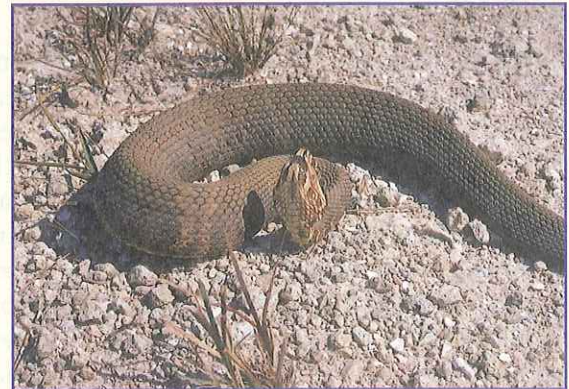


Figure 6

Water moccasin (cottonmouth).



Figure 7

Coral snake; the United States' most venomous snake.

The first three are pit vipers, which have three characteristics in common:

- Triangular, flat heads wider than their necks
- Elliptical pupils (cat-like eyes)
- A heat-sensitive pit between the eye and the nostril on each side of the head

The coral snake is small and colorful, with a series of bright red, yellow, and black bands around its body (every other band is yellow). Coral snakes are found in Arizona, the southeastern United States, and Texas.

At least one species of venomous snakes is found in every state except Alaska, Hawaii, and Maine. Exotic snakes, whether imported legally or smuggled into the United States, can be found in zoos, schools, snake farms, and amateur and professional collections, and account for at least 15 bites a year. Some of the exotic snakes can be poisonous.

Pit Vipers

Pit vipers are found in every state but Alaska, Maine, and Hawaii. Rattlesnakes are the most widespread of the pit vipers. Copperheads are found in the central southeastern United States and westward into the Big Bend of Texas. Cottonmouth water moccasins are found in the southeast from Virginia to Florida and into Texas. Snakes benefit us by keeping the rodent population from exploding out of control. They consume hundreds of thousands of mice and rats every year. Few snakes act aggressively toward a human unless provoked. The vast majority of bites are not deadly and can be effectively treated.

Ninety-eight percent of snake bites are on the extremities. Alcohol intoxication of the victim is



Figure 8

Location of venomous snakes.

a factor in many bites. The majority of bites in the United States occur in the southwestern part of the country—partly due to the near-extinction of pit vipers in the eastern United States. The eastern and western diamondback rattlesnakes account for almost 95% of the deaths. These deaths occur most often in children, in the elderly, and in victims to whom **anti-venom** is not given or is inappropriately given.

Recognizing Pit Viper Bites

Signs of a pit viper bite include:

- Severe burning pain at the bite site.
- Two small puncture wounds about $\frac{1}{2}$ " apart (some cases have only one fang mark)
- Swelling (occurs within 10 to 15 minutes and can involve an entire extremity).
- Discoloration after 2–3 hours and blood-filled blisters possibly developing in 6 to 10 hours.



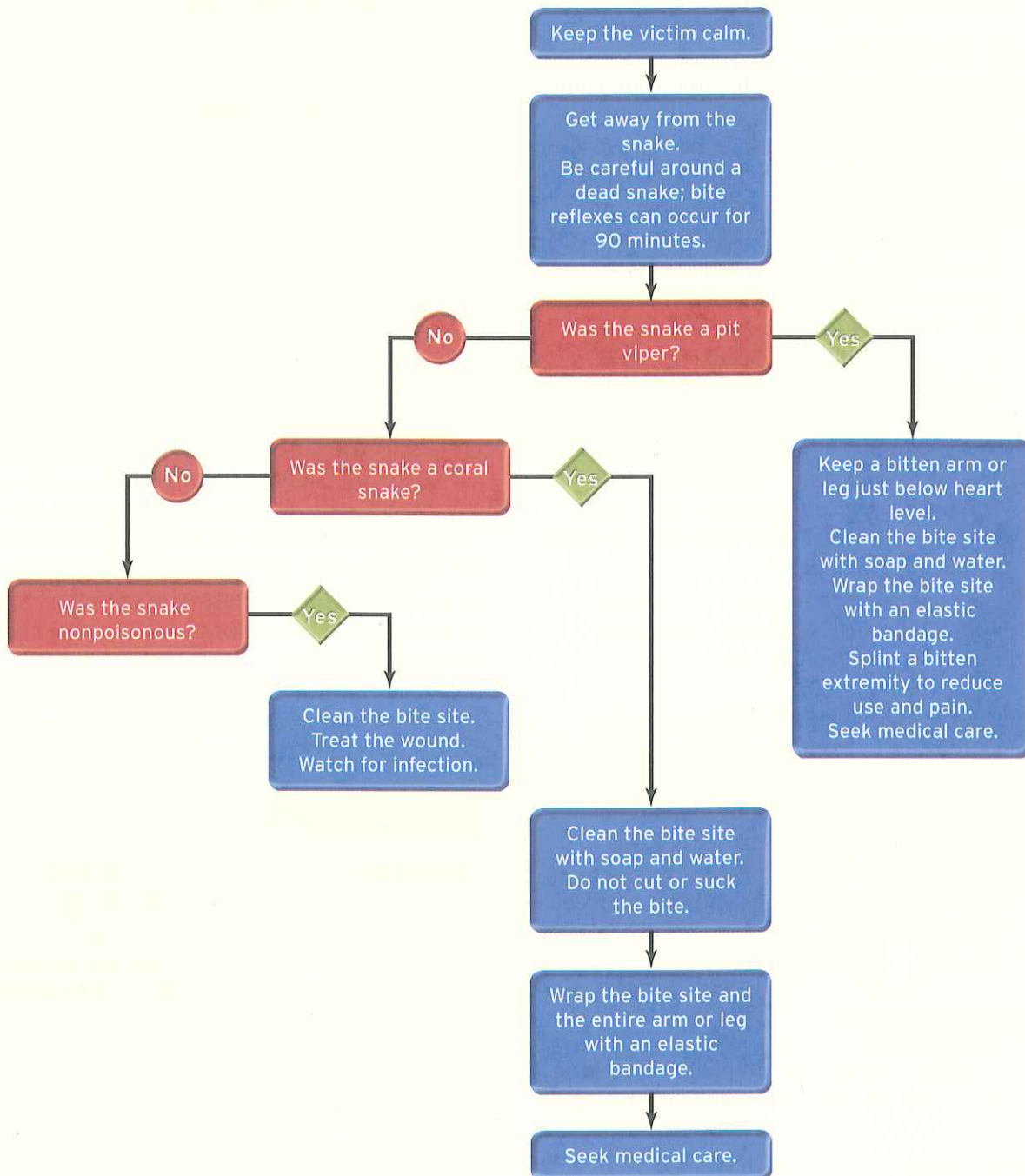
Figure 9



Figure 9

Rattlesnake bite.

Snake Bites



- In severe cases, nausea, vomiting, sweating, and weakness.
- In about 25% of venomous snake bites, there is no venom injection, only fang and tooth wounds (known as a dry bite).

Care for Pit Viper Bites

The Wilderness Medical Society lists these guidelines for dealing with pit viper bites:

1. Get the victim and bystanders away from the snake. Snakes have been known to bite more than once. Pit vipers can strike about one half of their body length. Be careful around a decapitated snake head—head reactions can persist for 90 minutes or more.
2. Do not attempt to capture or kill the snake. It wastes valuable time, there is a risk of additional bites, and identification of the snake is not usually needed because the same antivenom is used for all pit viper bites.
3. Keep the victim quiet. Activity increases venom absorption. If possible, carry the victim or have the victim walk very slowly to help to minimize exertion.
4. Gently wash the bitten area with soap and water. Any ring(s) or jewelry that might reduce blood circulation if swelling occurs should be removed.
5. Stabilize the bitten extremity (arm or leg) with a sling or a splint as you would for a fracture. Keep the extremity below heart level despite the fact that swelling might occur.
6. Seek medical care immediately. This is the most important thing to do for the victim. Antivenom must be given within 4 hours of the bite (not every venomous snake bite requires antivenom).

Coral Snake Bites

The coral snake is America's most venomous snake, but it rarely bites people. The coral snake has short fangs and tends to hang on and chew its venom into the victim rather than to strike and release, like a pit viper. Coral snake venom is a neurotoxin, and symptoms can begin 1 to 5 hours after the bite.

Recognizing Coral Snake Bites

Someone who has been bitten by a coral snake might exhibit the following symptoms:

- Minimal pain
- Sagging or drooping of upper eyelids

- Weakness
- Pricking, tingling of skin (often numb at bite site)
- Double vision (seeing two of a single object)
- Difficulty in swallowing
- Sweating
- Abnormal flow of saliva

Care for Coral Snake Bites

You can help a coral snake bite victim in the following manner:

1. Keep the victim calm.
2. Gently clean the bite site with soap and water.
3. Apply mild pressure by wrapping several elastic bandages over the bite site and the entire arm or leg. Applying mild pressure (as tightly as for a sprained ankle) is recommended for any snake bites. The technique originated in Australia, where it has been very successful. Do not cut the victim's skin, suck on the wound, or use a suction device.

This technique has two parts: (1) The pressure holds the venom at the bite site and prevents it from moving through the lymphatic system to other parts of the body, and (2) immobilization limits the pumping action of the muscles.

4. Seek medical care. Antivenom for coral snakes is no longer produced in the United States.

CAUTION

DO NOT apply cold or ice to a snake bite. It does not inactivate the venom and poses a danger of frostbite.

DO NOT use the cut-and-suck procedure—you could damage underlying structures (for example, blood vessels, nerves, or tendons). Cutting the skin may cause infection and a poorly healing wound.

DO NOT apply mouth suction. Your mouth is filled with bacteria, increasing the likelihood of wound infection.

DO NOT use any form of suction.

DO NOT apply electric shock. No medical studies support this method.

DO NOT apply a constriction band—their use remains controversial. They may increase tissue damage. If applied too tightly or if swelling occurs, they can act as a tourniquet.

FYI**Dead Snakes Can Still Bite**

Data collected at the Good Samaritan Regional Medical Center in Phoenix show that fatal injuries do not prevent rattlesnakes from biting humans. Of the 34 patients admitted to the Phoenix Center for Rattlesnake Bites in a recent 11-month period, five were bitten by snakes that had been fatally injured and were presumed dead. One patient was bitten on the index finger after picking up a snake he had bludgeoned in the head and assumed was dead. Another was bitten after picking up a snake he had shot, then decapitated.

Source: Suchard JR, LoVecchio F. 1999. Envenomations by rattlesnakes thought to be dead. *N Engl J Med* 340(24):1930.

Nonpoisonous Snake Bites

Nonvenomous snakes inflict the most snake bites. If you are not positive about a snake, assume it was venomous. Some so-called nonpoisonous North American snakes such as the hognose and garter snakes have venom that can cause painful local reactions but no systemic (whole-body) symptoms.

Recognizing Nonpoisonous Snake Bites

A nonpoisonous snake bite results in the following:

- Feeling of a mild to moderate pinch
- Curved lines (horseshoe shaped) of tiny pinpricks on the skin that correspond with the rows of sharp, pointy teeth
- Bleeding
- Mild itching

Care for Nonpoisonous Snake Bites

A victim of a nonpoisonous snake bite should be treated as follows:

1. Gently clean the bite site with soap and water.
2. Care for the bite as you would a minor wound.
3. Seek medical care.

► Insect Stings

Generally, venomous flying insects are aggressive only when threatened or when their hives or nests are disrupted. Under such conditions, they sting, sometimes in swarms. Honeybees and some yellow jackets have

barbed stingers that become embedded in the victim's skin during the sting **Figure 10**. After injecting its venom, the bee flies away, tearing and leaving behind the embedded stinger and venom sac, which causes it to die. Honeybees and bumblebees do not release all their venom during the initial injection; some remains in the stinger embedded in the victim's skin. If the stinger and venom sac are not removed properly, additional venom can be released and worsen the victim's reaction.

In contrast, the stingers of wasps, yellow jackets, hornets, and fire ants are not barbed and do not become embedded in the victim. Thus, these insects can sting multiple times, and most species (with a few exceptions, such as some yellow jacket species) do not die as a result of the stinging.

Recognizing Insect Stings

A rule of thumb is that the sooner symptoms develop after a sting, the more serious the reaction will be.

- Usual reactions are instant pain, redness around the sting site, and itching.
- Worrisome reactions include hives, swelling of lips or tongue, a tickle in the throat, and wheezing.
- Life-threatening reactions are bluish or grayish skin color, seizures, unresponsiveness, and an inability to breathe because of swelling and spasm of the airway.

About 60% to 80% of anaphylactic deaths are caused by the victim not being able to breathe because swollen airway passages obstruct airflow to the lungs. The second most common cause of death is shock, caused by collapse of blood circulation through the body.

Care for Insect Stings

The following outlines how to assist someone who has been bitten or stung by an insect.

1. Most people who have been stung can be treated on site, and everyone should know what to do if a life-threatening allergic reaction (anaphylaxis) occurs. In particular, people who have had a severe reaction to an insect sting should be instructed about what they can do to protect themselves. They also should be advised to wear a medical-alert identification tag identifying them as allergic to insect stings.

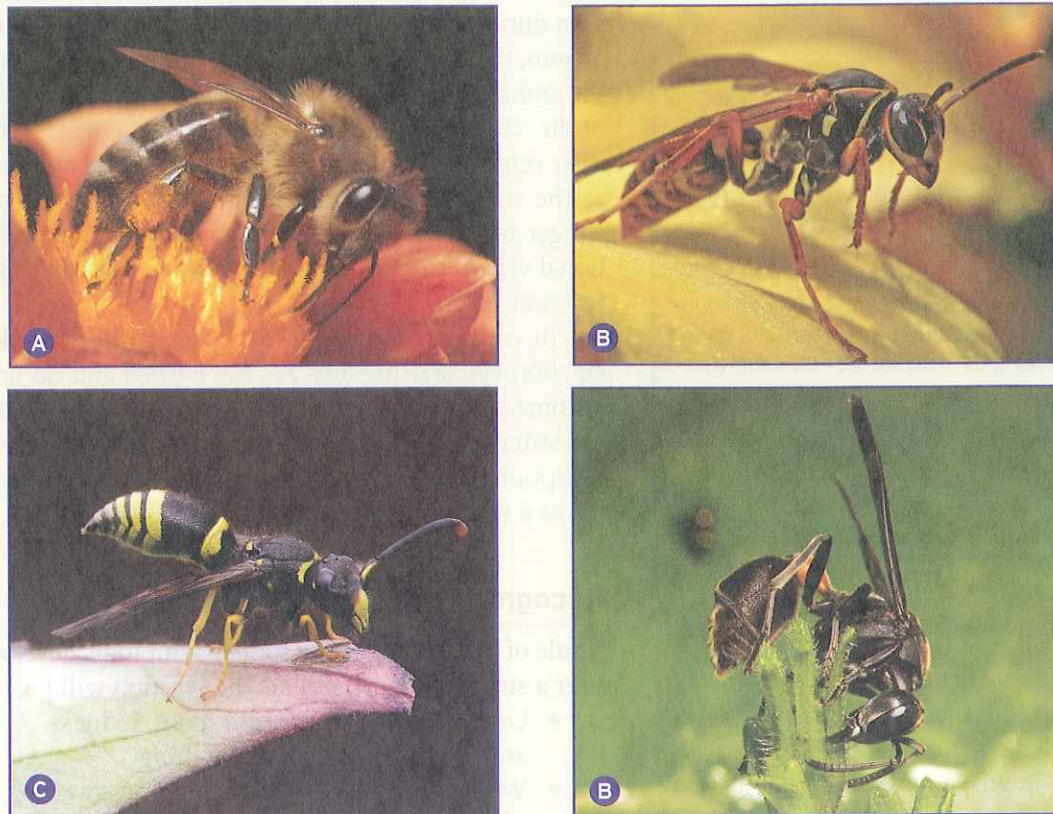
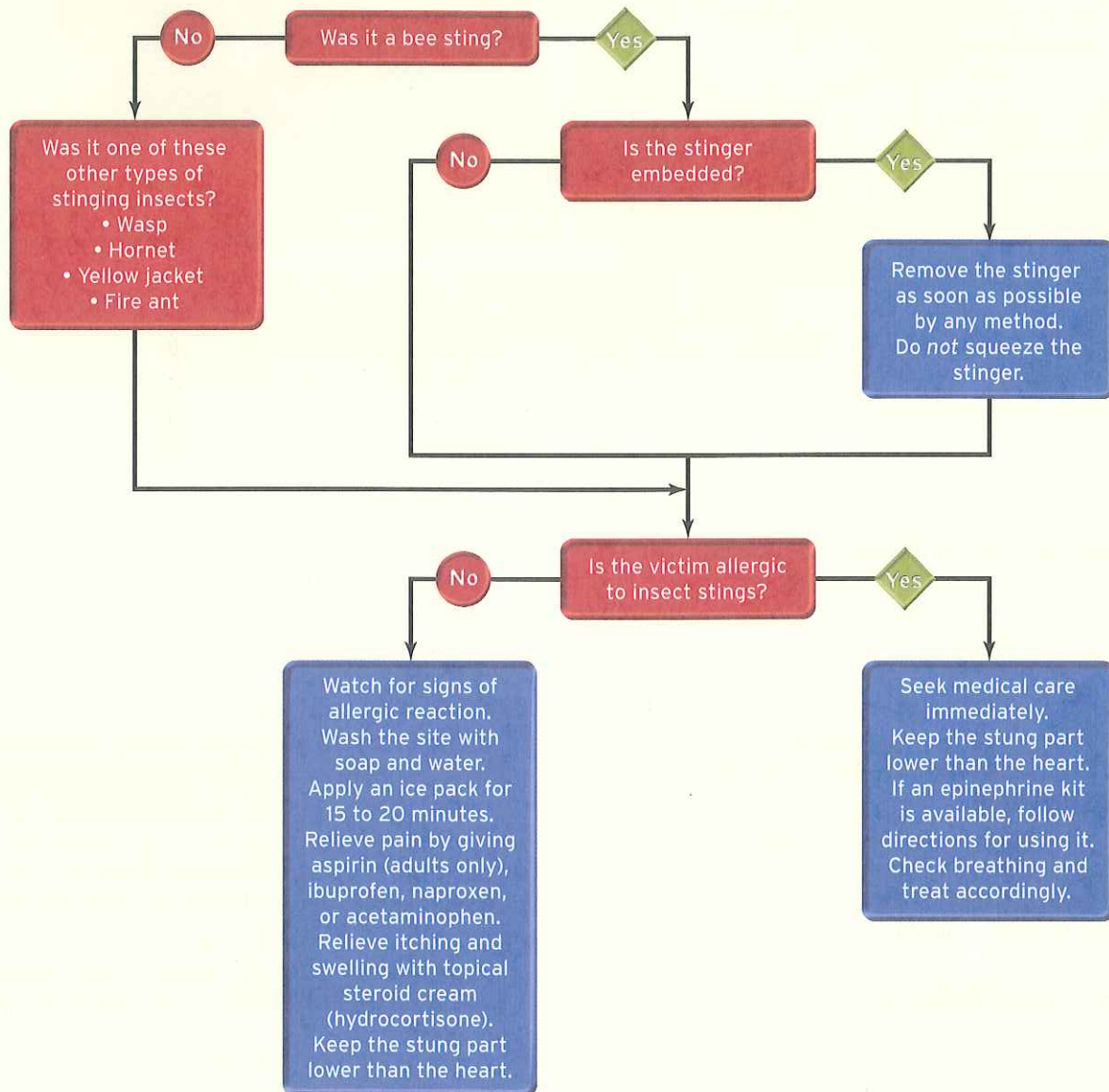


Figure 10

Bees. A. Honeybee. B. Yellow jacket. C. Hornet. D. Wasp.

2. Look at the sting site for a stinger and venom sac embedded in the skin. Bees are the only stinging insects that leave their stingers and venom sac behind. If the stinger is embedded, remove it or it will continue to inject poison for 2 or 3 minutes. Remove the stinger and venom sac as soon as possible by any method.
3. Wash the sting site with soap and water to prevent infection.
4. Apply an ice pack over the sting site to slow absorption of the venom and relieve pain. Use a commercial sting stick containing a topical anesthetic such as Xylocaine (unless the victim is known to be allergic to the drug). Because bee venom is acidic, a paste made of baking soda and water can help. Sodium bicarbonate is an alkalizing agent that draws out fluid and reduces itching and swelling. Wasp venom, on the other hand, is alkaline, so apply vinegar or lemon juice. A paste made of unseasoned meat tenderizer can help a bee sting victim if the paste comes in direct contact with the venom. That generally is not possible, however, because the bee will have injected the venom through too small a hole and too deeply into the victim's skin.
5. To further relieve pain and itching, use aspirin (adults only), acetaminophen, or ibuprofen. A topical steroid cream, such as hydrocortisone, can help combat local swelling and itching. An antihistamine can prevent some local symptoms if given early, but it works too slowly to counteract a life-threatening allergic reaction.
6. Observe the victim for at least 30 minutes for signs of an allergic reaction. For a person having a severe allergic reaction, a dose of epinephrine is the only effective treatment. A person with a known allergy to insect stings should have a physician-prescribed emergency kit that includes a prefilled, spring-loaded device that automatically injects

Insect Stings



4. Give aspirin (adults only), ibuprofen, or acetaminophen.
5. Seek medical care immediately.

Tarantulas

Tarantulas bite only when vigorously provoked or roughly handled (Figure 14). The bite varies from almost painless to a deep throbbing pain lasting up to 1 hour. The tarantula, when upset, will roughly scratch the lower surface of its abdomen with its legs and flick hairs onto a person's skin.

Recognizing Tarantula Bites and Embedded Hairs

Tarantula bites and embedded hairs have the following characteristics:

- The bite causes pain—aching or stinging.
- The hairs cause itching and inflammation that can last several weeks.

Care for Tarantula Bites and Embedded Hairs

To care for a victim of a tarantula bite:

1. If possible, catch the spider to confirm its identity. Even if the body has been crushed, save it for identification (although most spider bite victims never see the spider). The species helps determine the treatment, so the dead spider (if it can be found) should be taken with the victim to the hospital.



Figure 14

Tarantula.

2. Clean the bite area with soap and water or rubbing alcohol.
3. Place an ice pack over the bite to relieve pain and delay the effects of the venom.
4. Give aspirin (adults only), ibuprofen, or acetaminophen.
5. Seek medical care immediately.

To care for a victim of embedded tarantula hairs:

1. Remove the hairs from the skin with sticky tape (repeating as necessary).
2. Wash the area with soap and water.
3. Apply hydrocortisone cream.
4. Give the victim pain medication (aspirin—for adults only—or ibuprofen or acetaminophen)
5. Give the victim an antihistamine.

Common Aggressive House Spider (Hobo Spider)

Another biter is the common aggressive house spider, or hobo spider. It arrived in the Pacific Northwest in 1936 and slowly made its way across Washington State and into surrounding states. In those areas, the hobo spider is the most common large spider.

Recognizing Common Aggressive House Spider Bites

The signs and symptoms of the common aggressive house spider bite are similar to those of the brown recluse spider.

- Redness, blisters, and later, gangrene (dead tissue)
- Headache, visual problems, weakness

Care for Common Aggressive House Spider Bites

If someone has been bitten by a common aggressive house spider, you can help by doing the following:

1. If possible, catch the spider to confirm its identity. Even if the body has been crushed, save it for identification (although most spider bite victims never see the spider). The species helps determine the treatment, so the dead spider (if it can be found) should be taken with the victim to the hospital.
2. Clean the bite area with soap and water or rubbing alcohol.
3. Place an ice pack over the bite to relieve pain and delay the effects of the venom.
4. Give aspirin (adults only), ibuprofen, or acetaminophen.
5. Seek medical care immediately.

Spider Bites and Scorpion Stings

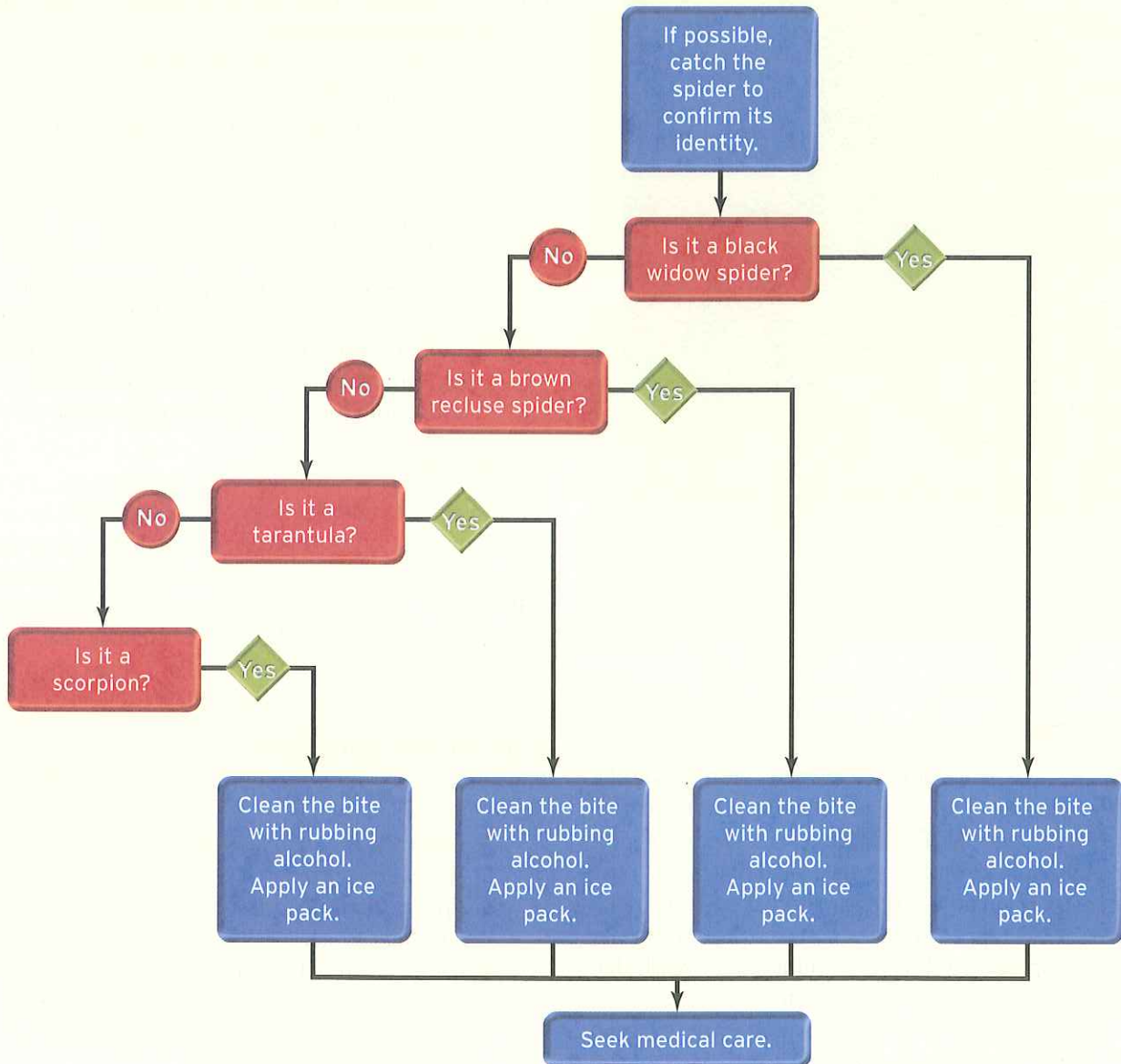




Figure 15

Bark scorpion.

Scorpions

Scorpions look like miniature lobsters, with lobsterlike pincers and a long, up-curved taillike appendage with a poisonous stinger **Figure 15**. Several species of scorpions inhabit the southwestern United States, but only the bark scorpion poses a threat to humans. Severe cases, which usually appear only in children, could include paralysis, spasms, or breathing difficulties. Death due to scorpion stings in the United States is rare.

The bark scorpion is found primarily in Arizona. Rare stings have been reported in other parts of the United States, after the scorpions traveled from Arizona as stowaways in luggage or in car trunks. The bark scorpion is pale tan and is $\frac{3}{4}$ " to $1\frac{1}{4}$ " long, not including the so-called tail.

Stings to adult victims usually are not life threatening. Stings to small children, however, are often dangerous. When a child is stung, every effort should be made to get the victim to medical care as quickly as possible. Pay close attention to make sure the victim's airway is open and that he or she is breathing.

Recognizing Scorpion Stings

The most frequent symptom of a scorpion sting, especially to an adult victim, is local, immediate pain and burning around the sting site. Later, numbness or tingling occurs.

Care for Scorpion Stings

Care for a scorpion sting victim by doing the following:

1. Monitor breathing.
2. Gently clean the sting site with soap and water or rubbing alcohol.
3. Apply an ice pack over the sting site to reduce pain and venom absorption.
4. Give aspirin (adults only), ibuprofen, or acetaminophen.
5. Seek medical care. Recently, bark scorpion antivenom production has been discontinued. Its use was controversial. The US Food and Drug Administration has given approval for clinical trials to evaluate a Mexican antivenom for use in the United States.

Mosquitoes

Mosquitoes bite millions of people. Mosquitoes are not only a nuisance, but they also carry many diseases. In developing countries, mosquitoes transmit malaria, yellow fever, and dengue fever; in the United States, they carry encephalitis. There is no evidence that mosquitoes transmit HIV, the virus that causes acquired immunodeficiency syndrome (AIDS).

Care for Mosquito Bites

You can care for someone who has mosquito bites in the following manner:

1. Wash the bitten area with soap and water.
2. Apply an ice pack.
3. Apply calamine lotion or hydrocortisone ointment to decrease redness and itching.
4. For a victim with a number of bites or a delayed allergic reaction, an antihistamine every 6 hours or a physician-prescribed cortisone might be useful.

Ticks

Some ticks produce a substance that helps cement them to the host. As they feed, some ticks increase in size 20 to 50 times **Figure 16**.

Care for Embedded Ticks

Remove ticks as soon as possible. If a tick is carrying a disease, the longer it stays embedded, the greater the chance of the disease being transmitted. Because

FYI**The Knot Method of Tick Removal**

An embedded tick should be removed as soon as possible. The longer an infected tick stays embedded, the more likely it is to transmit a disease. An alternative to using tweezers and special commercial tick removal devices, especially when they are not available, is the knot method.

Use cotton thread or dental floss and tie an overhand knot (similar to a shoelace knot without the bows). The open overhand knot is placed over the tick as close as possible to the skin surface and then gently closed to form a loop around the tick. Lift the tick's body over its head in a somersault-type fashion to remove the tick. This method removes the entire tick and is simple and effective.

Source: Celensa A. 2002. The knot method of tick removal. *Wilderness Environ Med* 13(2):181.

its bite is painless, a tick can remain embedded for days before the victim realizes it. Most tick bites are harmless, although ticks can carry Lyme disease, Rocky Mountain spotted fever, and other serious diseases **Figure 17**.



Figure 17

A bull's-eye rash is a distinctive finding in Lyme disease, but is not always present in victims.



A



B

Figure 16

A. Tick embedded and engorged. B. Tick embedded.

CAUTION

DO NOT use the following popular methods of tick removal, which are ineffective:

- Applying petroleum jelly
- Applying fingernail polish
- Applying rubbing alcohol
- Touching a hot match to the tick
- Applying a petroleum product, such as gasoline

DO NOT grab a tick at the rear of its body. The internal organs could rupture, and the contents could be squeezed out, causing infection.

DO NOT twist or jerk the tick, which could result in incomplete removal.

Care for a Shark Bite or Puncture

To care for a victim of shark bite or puncture:

1. Control bleeding.
2. Treat for shock.
3. Seek medical care.

Barracudas and Moray Eels

Barracudas have a fearsome appearance, but they have an undeserved reputation as attackers of humans. The risk of a barracuda bite is exceedingly small. First aid for a barracuda bite is identical to that for a shark bite.

Moray eels also have a fierce appearance. They are not infrequent biters of divers who handle or tease them, usually in competition for food or in pursuit of lobsters. The multiple puncture wounds created by moray eel bites have a high infection risk. Treat these wounds as you would shark bites.

Recognizing Barracuda and Moray Eel Bites

Barracuda and moray eel bites have the following characteristics:

- Barracuda lacerations are similar to those of a shark.
- Eel bites involve severe puncture wounds with their narrow jaws. Eels will hold onto a victim, rather than strike and release. They leave multiple, small puncture wounds.

Care for Barracuda and Moray Eel Bites

The following list indicates how to care for a barracuda or moray eel bite victim.

- Care for a barracuda bite as you would a shark bite.
- Care for an eel bite by:
 - Flushing the wound with water under pressure.
 - Controlling bleeding.

Marine Animals that Sting

Stings from marine animals lead the list of adverse marine animal encounters. It is important to identify the offending animal, because in many cases, first aid is quite specific. Each year, jellyfish, Portuguese man-of-wars, corals, and anemones that lie along the shallow ocean waters of the United States sting more than 1 million people. Reactions to being stung vary from mild dermatitis to severe reactions. Most victims recover without medical attention.



Figure 20

Portuguese man-of-war.

Jellyfish and Portuguese man-of-wars have long tentacles equipped with stinging devices called **nematocysts**. When cast ashore or onto rocks, detached nematocysts retain their ability to sting for a long time, usually until they are completely dried out.

The Portuguese man-of-war sting is usually in the form of well-defined linear welts or scattered patches of welts with redness, which usually disappear within 24 hours (Figure 20). The jellyfish sting produces severe muscle cramping with multiple, thin lines of welts crossing the skin in a zigzag pattern (Figure 21). Pain usually is a burning type that lasts 10 to 30 minutes. The welts on the skin usually disappear within an hour.

CAUTION

DO NOT try to rub the tentacles off of the victim's skin—rubbing activates the stinging cells.

DO NOT use fresh water for rinsing because it will cause the nematocysts to fire.

DO NOT apply cold packs—they also will cause the nematocysts to fire.

DO NOT touch the tentacles with your bare hands.

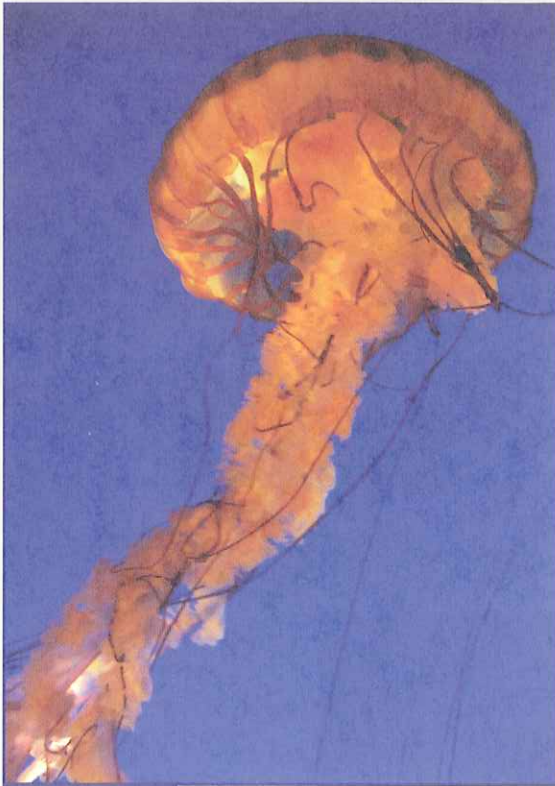


Figure 21

Jellyfish.

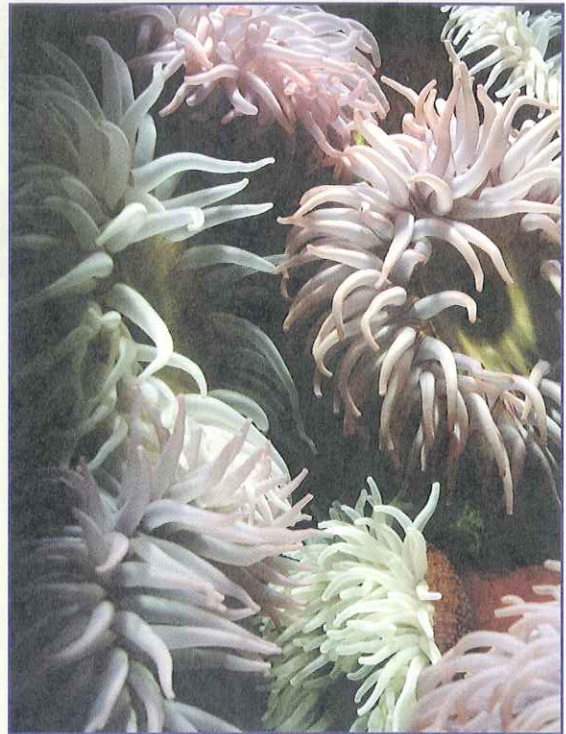


Figure 22

Anemones.

Anemones are beautiful but potentially dangerous **Figure 22**. Many anemone stings result from the improper handling of aquarium animals.

Recognizing Marine Stings

Marine stings cause the following symptoms:

- Stinging
- Severe itching, burning
- Prickling, tingling
- Blisters
- Severe allergic reaction
- Difficulty breathing
- Muscle cramping
- Nausea, vomiting

Care for Marine Stings

Follow these steps to care for a victim of a marine sting:

1. Apply vinegar to the sting area for at least 30 seconds; it deactivates the nematocysts. If vinegar is not available, use a baking soda paste.

2. Use hot water (110° F [43° C]) immersion for at least 20 minutes to reduce pain. If hot water is not available, use hot dry packs.
3. Apply a coating of hydrocortisone (1%) several times a day.

Stingrays

Stingrays, commonly found in tropical and subtropical waters, are peaceful, reclusive bottom feeders that generally lie buried in the sand or mud **Figure 23**. Most wounds inflicted by stingrays are produced on the ankle or foot when the victim steps on a ray. The ray reacts by thrusting its barbed tail upward and forward into the victim's leg or foot. At least 1,500 stingray injuries occur each year in coastal US waters. The stingray's venomous tail barb easily penetrates human skin. The sting usually is more like a laceration because the large tail barb can do significant damage. The venom causes intense burning pain at the site.

Marine Animal Injuries

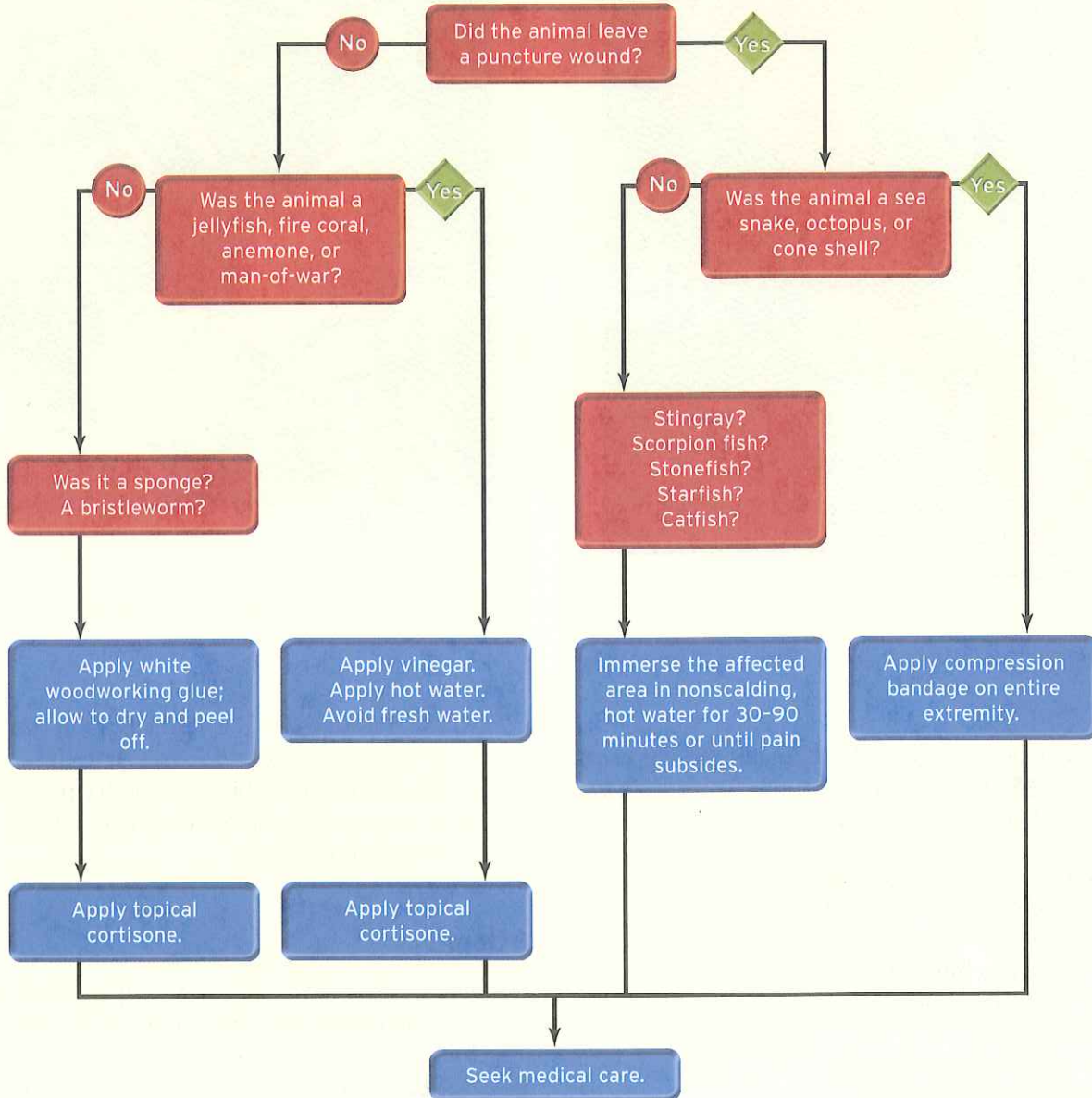




Figure 23

Stingray.

Care for Stingray Punctures

You can care for stingray puncture victims by doing the following:

1. Relieve pain by immersing the injured body part in hot water (110° F [43° C]) for 30 to 90 minutes. Make sure the water is not hot enough to cause a burn.
2. Wash the wound with soap and water.
3. Irrigate the area with water under pressure to wash out as much of the toxin and foreign material as possible.
4. Treat the wound like any puncture wound.

Recognizing Stingray Punctures

A stingray puncture results in the following:

- Sudden, intense pain
- An open wound
- Swelling

► Emergency Care Wrap-up

Condition	What to Look For	What to Do
Bites and stings	Animal and human bites Torn tissue Bleeding	Wash wound with soap and water. Flush wound thoroughly with water under pressure. Control bleeding. Seek medical care.
	Venomous snake bites Severe, burning pain Small puncture wounds Swelling Nausea, vomiting, sweating, weakness Discoloration and blood-filled blisters developing hours after the bite	Get away from the snake. Limit victim's movement and keep bitten extremity below heart level. Call 9-1-1. Gently wash area with soap and water. Apply mild pressure by wrapping the entire affected arm or leg with an elastic bandage.

Condition	What to Look For	What to Do
	Insect stings Pain Itching Swelling Severe allergic reaction, including breathing problems	Remove any stinger. Wash with soap and water. Apply an ice or cold pack. Give pain medication and an antihistamine and apply hydrocortisone cream. Observe for at least 30 minutes for signs of severe allergic reaction. Call 9-1-1 if a severe allergic reaction occurs. If victim has an epinephrine auto-injector, help victim use it.
	Spider bites Black widow May feel sharp pain Two small fang marks Severe abdominal pain Headache, chills, fever, sweating, dizziness, nausea Brown recluse and hobo Blister developing several days later Ulcer in skin Headache, fever, weakness, nausea	Catch spider for identification. Wash bitten area with soap and water. Apply an ice or cold pack. Seek medical care.
	Scorpion stings Pain and burning at sting site Later, numbness or tingling	Wash sting site with soap and water. Apply an ice or cold pack. Seek medical care.
	Tick bites Tick still attached Rash (especially one shaped like a bull's-eye) Fever, joint aches, weakness	Remove tick. Wash bitten area with soap and water. Apply rubbing alcohol. Apply an ice or cold pack. Watch bitten area for 1 month for rash. Seek medical care if rash or other signs such as fever or muscle joint aches appear.
Marine animal injuries	Bites, rips, or punctures from marine animals (for example, sharks, barracudas, moray eels)	Control bleeding. Treat for shock. Call 9-1-1.
	Stings from marine animals (for example, jellyfish, Portuguese man-of-war)	Apply vinegar (minimum of 30 seconds). Immerse in hot water for 20 minutes to reduce pain.
	Punctures from marine animal spines (for example, stingray)	Immerse injured part in hot water for 30 to 90 minutes. Wash with soap and water. Flush with water under pressure. Care for wound.

► Ready for Review

- Almost half of all Americans will suffer a bite from either an animal or human.
- Throughout the world, about 50,000 people die each year of snake bites.
- The stinging insects belonging to the order of Hymenoptera include honeybees, bumblebees, yellow jackets, hornets, wasps, and fire ants.
- Most spiders are venomous, which is how they paralyze and kill their prey. However, most spiders lack an effective delivery system—long fangs and strong jaws—to bite a human.
- Most marine animals bite or sting in defense, rather than attack.

► Vital Vocabulary

antivenom An antiserum containing antibodies against reptile or insect venom.

nematocysts Stinging cells found on certain marine animals.

rabies An acute viral infection of the central nervous system transmitted by the bite of an infected animal.

► Assessment in Action

You are enjoying an overnight campout with your family in the springtime. As you get ready for bed, you notice a small lump on your belly and are startled to find an embedded tick.

Directions: Circle Yes if you agree with the statement; circle No if you disagree.

- | | | |
|-----|----|--|
| Yes | No | 1. You should leave the tick alone because it will cause no harm to humans. |
| Yes | No | 2. Covering the tick with petroleum jelly is very effective for removing the embedded tick. |
| Yes | No | 3. You should touch a hot, blown-out match to the tick. |
| Yes | No | 4. Grabbing the tick as close to the skin as possible with tweezers and pulling upward is usually effective. |
| Yes | No | 5. After removing the tick, clean the wound and use an icepack to reduce pain. |

prep kit

► Check Your Knowledge

Directions: Circle Yes if you agree with the statement; circle No if you disagree.

- | | | |
|-----|----|--|
| Yes | No | 1. Severe abdominal pain is a sign of a black widow spider bite. |
| Yes | No | 2. Apply an ice or cold pack over a snake bite. |
| Yes | No | 3. Use the cut and suck method for a snake bite. |
| Yes | No | 4. Remove a bee's stinger by using tweezers to pull it out. |
| Yes | No | 5. Apply an ice or cold pack over an insect sting or a suspected spider bite. |
| Yes | No | 6. A baking soda paste can help reduce the itching and swelling from an insect sting. |
| Yes | No | 7. A victim's prescribed auto-injector might have to be used if the victim has a life-threatening reaction to an insect sting. |
| Yes | No | 8. Care for stings from marine animals (for example, jellyfish) by pouring hydrogen peroxide on the affected area. |
| Yes | No | 9. Covering an embedded tick with petroleum jelly causes the tick to back out because of the lack of oxygen. |
| Yes | No | 10. Ticks can transmit disease. |