

Heat-Induced Emergencies

Section 6

- Body normally removes heat via radiation and evaporation of sweat
 - Mechanisms do not work as well in hot/humid weather
 - Body's core temperature increases

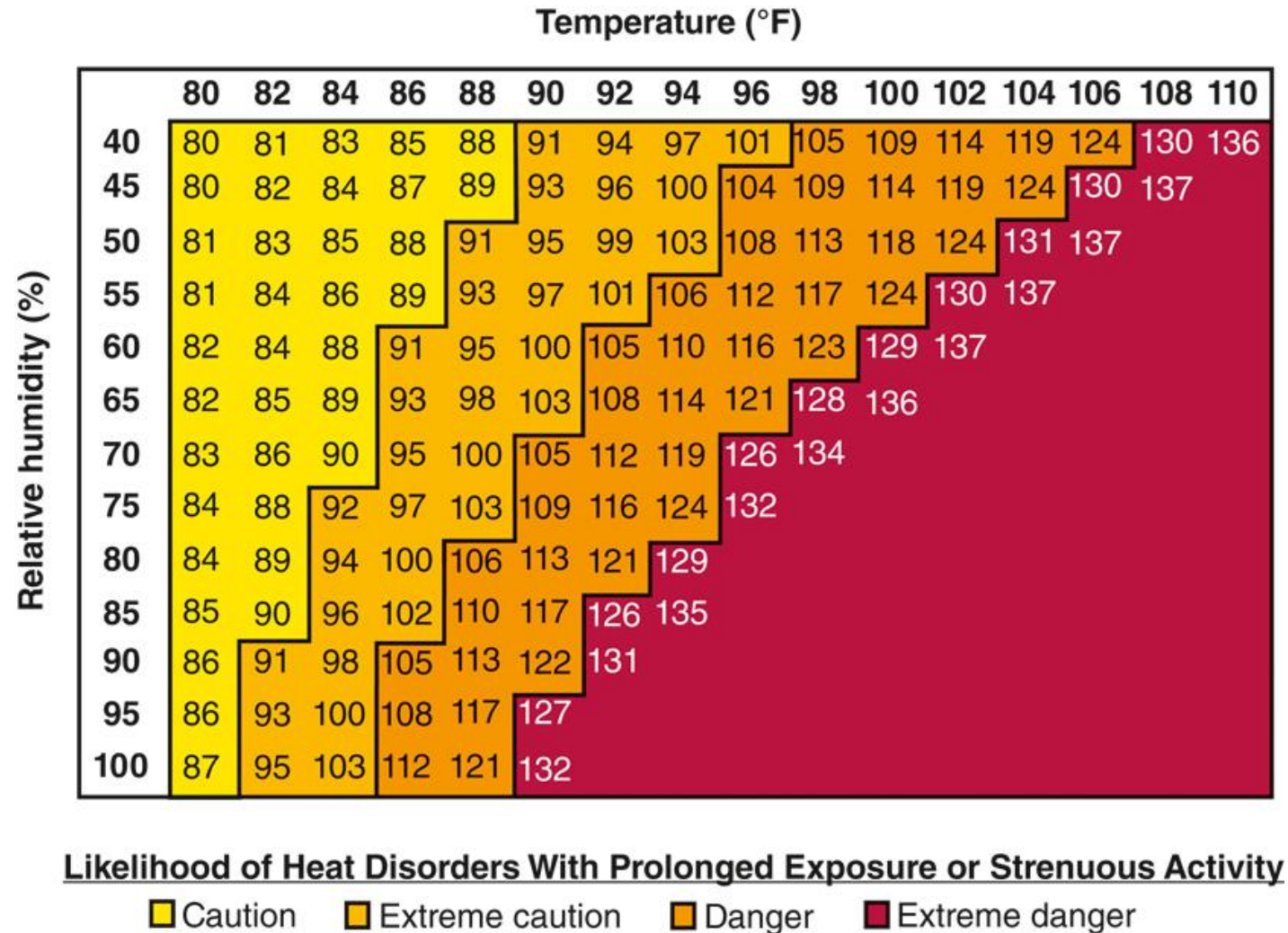


Figure 6-1

Courtesy of the National Oceanic and Atmospheric Administration

Heatstroke (1 of 3)

- Classic heatstroke
 - Older, chronically ill, or and/or sedentary people, and people taking certain medications or abusing drugs/alcohol
 - Common during heat waves
 - Affected people do not sweat
- Exertional heatstroke
 - Young, healthy people who are not acclimatized to the heat during strenuous activity
 - Sweating occurs in about 50% of affected people

The skin can be wet or dry with Heatstroke!
Do not use this as a determining factor, look for:
Altered Mental Status

Heatstroke (2 of 3)

- Compared with heat exhaustion, people with heatstroke have:
 - Altered mental status
 - Skin that is hot to the touch
 - Body temperature of 104°F or higher (this is “core body temperature”)
- Heatstroke is life threatening and must be treated immediately

Heatstroke (3 of 3)

What to Look For	What to Do
▪ Extremely hot skin ▪ Skin is usually dry, but may be wet from sweating related to strenuous work or exercise ▪ Altered mental status ranging from slight confusion and disorientation to unresponsiveness ▪ Flushed skin ▪ Flulike symptoms (headache, body aches, nausea, and sometimes vomiting) ▪ Seizures may occur	1. Call 9-1-1 immediately. 2. Move the person from the hot environment to a cooler, shaded place and begin cooling using any means possible. The order of effective cooling is: ▪ Whole body cold-water immersion. First, remove clothing down to the person's underwear and then: • Submerge the person's body and extremities up to the neck in a bath of cold water or tub of ice water. The colder the water, the faster the rate of cooling. OR • Have the person sit or lay down on a plastic sheet or tarp. Hold the sides up and apply water and crushed ice. Keep the sides upright to keep the mixture in place and move the tarp to keep the water moving around the person. OR • Use a natural body of water (eg, stream, pond, river, or lake) to submerge a person and help cool them off. DO NOT leave someone experiencing heatstroke in a body of water alone, as they may pass out and drown. ▪ Spraying or dousing cold water repeatedly on the person's skin and vigorously fanning. The method is half as fast as immersion cooling. ▪ Ice packs. Ice packs should cover the entire body. If chemical cold packs are used, they should be applied to the cheeks, palms, and soles rather than the skin covering the neck, armpits, and groin. Ice packs have greater cooling capacity than chemical cold packs. 3. Stop cooling when mental status improves, after 20 minutes, or when emergency medical services (EMS) arrives, whichever occurs first. 4. DO NOT give ibuprofen or aspirin. Although helpful in cases of fever caused by infectious diseases, they are not effective for treating heat-related illnesses.

Hyponatremia (Water Intoxication) (1 of 2)

- Level of sodium in body much lower than normal
 - Can be fatal
- Causes
 - Drinking too much water
 - Excessive sweating during endurance sports (longer than 2 hours)

Hyponatremia (Water Intoxication) (2 of 2)

What to Look For	What to Do
■ The person reports drinking excessive amounts of water (>1 quart [about 1 L] per hour) ■ Vomiting clear fluid ■ Profuse sweating for long periods ■ Frequent urination (clear urine) ■ Dizziness, weakness, nausea, headache ■ Altered mental status: confusion to unresponsiveness ■ Severe sodium loss may result in seizures and can be fatal	1. Move the person to a cool location. 2. DO NOT give more fluids. 3. If the person is able to swallow, give salty foods. DO NOT give salt tablets because they can irritate the stomach and cause nausea and vomiting. 4. Call 9-1-1 for • No improvement • Altered mental status • Seizures • Vomiting • Shortness of breath • Collapse

Heat Exhaustion (1 of 2)

- Heat exhaustion differs from heatstroke because the person has no altered mental status and their skin is clammy, not hot
- Requires cooling, but not as aggressively as heatstroke
 - Can evolve into heatstroke if not controlled

Heat Exhaustion (2 of 2)

What to Look For	What to Do
■ Pale or ashen skin ■ Clammy or sweaty skin, but not hot ■ Severe thirst ■ Fatigue ■ Dizzy ■ Flulike symptoms (headache, body aches, nausea, and sometimes vomiting) ■ Shortness of breath ■ Rapid heart rate	1. Move the person from the hot environment to a cooler, shaded place. 2. Remove excess clothing. 3. Spray or douse cold water on the person's skin and fan vigorously. 4. If the person is able to swallow, give a commercial sports drink, fruit juice, or lightly salted water; if none of these options are available, give cold water. DO NOT give salt tablets. 5. Call 9-1-1 if improvement does not occur within 15–20 minutes.

Heat Cramps and Heat Syncope

What to Look For	What to Do
Signs of heat cramps ■ Painful spasms in abdominal muscles or extremities, especially after exertion ■ Heavy sweating	Relief may take several hours. 1. Have the person rest in a cool place. 2. Give lightly salted cool water (dissolve a quarter teaspoon [1.25 mL] of salt in 1 quart [about 1 L] of water) or a commercial sports drink. DO NOT give salt tablets. 3. Massage the cramped muscles. 4. Apply an ice pack to the cramped muscles.
Signs of heat syncope occur immediately after strenuous activity in a hot environment ■ Dizziness ■ Fainting	1. If the person is unresponsive, check their breathing. A person with heat syncope will usually recover quickly. 2. If the person fell, check for injuries. 3. Have the person rest and lie down in a cool area. 4. Wet the skin with a cool, damp cloth or by splashing water on the face. 5. If the person is not nauseated and is alert and able to swallow, give lightly salted cool water (dissolve a quarter teaspoon [1.25 mL] of salt in 1 quart [about 1 L] of water) or a commercial sports drink. DO NOT give salt tablets.

Hypothermia (1 of 5)

- Severe and at times dangerous drop in body temperature
- Can occur year-round and does not require subfreezing temperatures

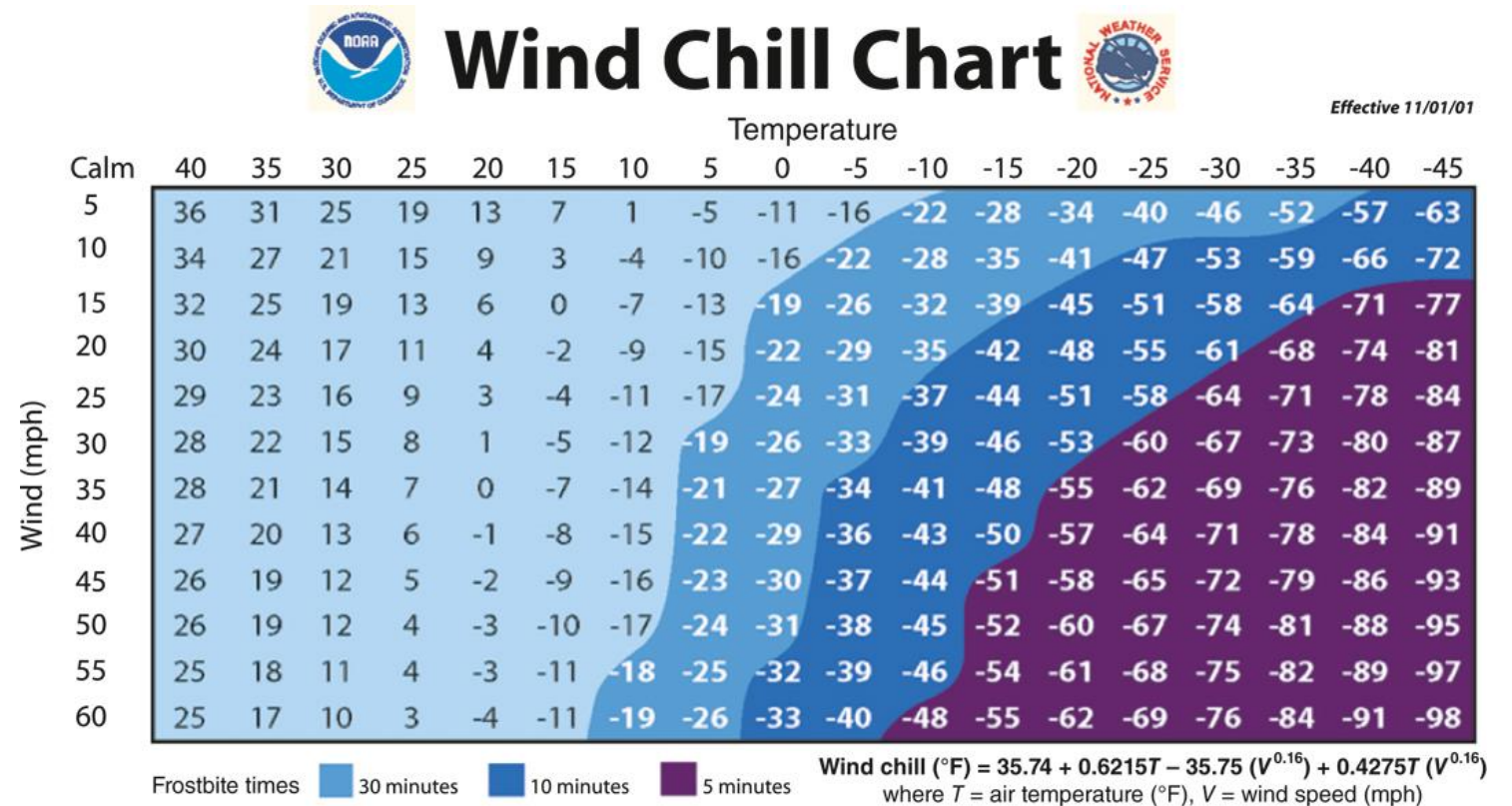


Figure 6-2

Courtesy of the National Weather Service/National Oceanic and Atmospheric Administration

Hypothermia (2 of 5)

What to Look For	What to Do
Any of the signs of mild, moderate, or severe hypothermia, discussed next	Take the following actions for all people with suspected hypothermia: 1. Get the person out of the cold. Treat hypothermia before treating frostbite. 2. Handle the person gently. 3. Add insulation (eg, extra clothing, blankets, towels, pillows, sleeping bag) beneath and around the person. Cover the person's head (eg, stocking cap, hood). 4. Cover the person with a vapor barrier (eg, tarp, trash bags with a hole cut out for the face) to prevent heat loss. DO NOT cover the mouth or nose. If the person's clothing is dry or damp, leave it on if you know that EMS will arrive in less than 20 minutes. If the clothing is very wet, there is shelter, and EMS is more than 20 minutes away, remove the wet clothing. If unable to remove wet clothing, place the vapor barrier between clothing and insulation. For a dry person, the vapor barrier can be placed outside the insulation. Ideally, use two vapor barriers (one against the person and one outside the insulating layer), which offers more protection.

Hypothermia (3 of 5)

What to Look For	What to Do
Signs of mild hypothermia ■ Vigorous, uncontrollable shivering ■ Awake and alert ■ Complains of feeling cold—painful hands and feet ■ Can answer questions intelligently ■ The “umbles” begin to appear: • Grumbles • Mumbles • Fumbles • Stumbles • Tumbles	1. Have the person sit or lie down for at least 30 minutes. 2. Warm the arms up to the elbows and the lower legs up to the knees in 107°F to 113°F (42°C to 45°C) water. 3. If alert and able to swallow, give high-calorie (sugary) food or drinks. Shivering rewarms a person who is mildly hypothermic. High-calorie food/drinks provide calories needed to maintain the shivering. Liquids and food may be warmed but should not be hot enough to burn the person’s mouth or throat. 4. Apply heat to the chest, armpits, and back (in this order). Upper torso rewarming is more effective than extremity rewarming. Use large electric pads, electric blankets, or warm water bottles. Place thin insulation between the skin and heat source to prevent burning the skin. Check the skin every 20 to 30 minutes for signs of burning. 5. Monitor for at least 30 minutes. 6. Call 9-1-1 if no improvement. DO NOT use warm showers or baths for rewarming. It causes too many medical complications. DO NOT use small chemical heat packs for rewarming. These packs (eg, used for hand and foot warming) do not provide sufficient heat to affect core body temperature and they can cause burns.

Hypothermia (4 of 5)

What to Look For

Signs of moderate hypothermia

- Shivering stops
- The “umbles” worsen
- Does not want to move much; may be sleepy
- Confused and indifferent to surroundings
- Skin is pale or blue and cold when touched

What to Do

1. Call 9-1-1, then follow Steps 1–4 for mild hypothermia.

2. Keep the person flat (horizontal).

DO NOT raise the legs. **DO NOT** allow standing or walking.

DO NOT massage the person’s body. **DO NOT** give any drink or food.

Hypothermia (5 of 5)

What to Look For	What to Do
Signs of severe hypothermia ■ Barely responsive or unresponsive ■ Rigid and stiff muscles ■ Skin feels ice cold and appears blue ■ Slow, shallow, or absent breathing ■ Appears dead. The signs of life, such as breathing, may be very difficult to detect.	1. Call 9-1-1. 2. Treat as moderate hypothermia. 3. If the person is not breathing, begin CPR (chest compressions and rescue breathing; see pp. 122–134). An AED can be used (see pp. 134–137). DO NOT start CPR if the person: • Has obvious fatal injuries • Is frozen (eg, ice in mouth and throat) • Has a chest that is stiff and cannot be compressed

Cold Stress

- Body temperature dropped, but symptoms not as severe as hypothermia
 - Requires care to prevent progression to hypothermia

What to Look For	What to Do
Signs of cold stress ■ Alert and shivering ■ Can move and care for themselves	Suspect cold stress, but not hypothermia. 1. Allow the person to remove their own wet clothing and to put on dry clothing. 2. Give high-calorie food or drink. 3. Move around; exercise to warm up. 4. Consider using a warm shower or bath.

Frostbite (1 of 4)

- Occurs when skin and underlying tissues freeze
 - Can lead to permanent tissue damage
 - Mainly affects hands, feet, and nose
 - Severity is judged after thawing; may require amputation



Figure 6-3

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Frostbite (2 of 4)



Figure 6-4

© American Academy of Orthopaedic Surgeons



Frostbite (3 of 4)

What to Look For

Before thawing, frostbite can be classified as superficial or deep:

- Superficial frostbite
 - White, waxy, or gray-yellow skin
 - The affected part feels very cold and numb. There might be tingling, stinging, or an aching sensation.
 - The skin surface feels stiff or crusty and the underlying tissue feels soft when depressed gently and firmly.
- Deep frostbite (**FIGURE 6-4**)
 - The affected part feels cold, hard, and solid and cannot be depressed; it feels like a piece of frozen meat.
 - Skin in the affected body part is pale and waxy.
 - A painfully cold part suddenly stops hurting.

What to Do

1. Get the person out of the cold and to a warm place. If possible, do not let the person use a frozen extremity until professional medical care is reached.
2. Call 9-1-1.
3. Remove any wet clothing and constricting items, such as rings, that could impair blood circulation. **DO NOT** attempt to thaw the part.

Frostbite (4 of 4)

CAUTION

- DO NOT** rub or massage an area affected by frostbite.
- DO NOT** apply ice, snow, or cold water to the affected area.
- DO NOT** break blisters.
- DO NOT** allow the person to smoke or drink alcohol.

Frostbite (Alternative Information – Wilderness Medicine) (1 of 3)

Treatment:

- If you must walk out - do not thaw and walk as walking on damaged tissue causes more damage than walking on frozen tissue.
- Get the person out of the cold into a warm place, do not let them use the frozen extremity.
- Remove wet clothing and constricting items.
- DO NOT attempt to thaw the part if:
 - Medical care is less than 2-hours away - **in this case, get them to medical care.**
 - The affected area has thawed
 - Shelter, warm water, and a container are not available
 - There is a risk of re-freezing of the affected part. There is more tissue damage if a body part has thawed and re-frozen and thawed again.

Frostbite (Alternative Information – Wilderness Medicine) (2 of 3)

Use the “Wet, Rapid, Re-Warming Method

- Give pain medication if possible - Thawing is painful (pins & needles pain)
 - Place the affected part in warm water (100° to 104°)
 - Do not use other heat sources
 - If no thermometer available - test the water with your hand “warm, not hot enough to burn”
 - Maintain the water temperature by adding warm water as needed
 - Once the part is soft and pliable to touch (20-40 minutes) Air dry the part - do not rub
 - For an ears or nose, it's best to use warm moist cloths, changing frequently.
- **DO NOT:** Rub or massage (this can cause cell damage due to the ice crystals inside the skin), **Do Not:** apply ice or snow, re-warm over a stove or fire, break blisters, or allow the person to smoke or drink alcohol, **Do not re-warm if re-freezing is possible.**

Frostbite (Alternative Information – Wilderness Medicine) (3 of 3)

After Thawing - Treatment:

- If feet are affected, do not allow the person to walk as walking on thawed tissue can cause additional damage.
- Protect area from contact with clothing and bedding
- Place bulky, dry, clean gauze on the affected part (between toes and fingers) to absorb moisture and keep them from sticking together.
- Elevate the affected part
- Apply Aloe Vera gel to promote skin healing
- Give pain medication
- Give fluids
- Seek medical care

Frostnip

- Superficial cold injury; top layers of skin freeze temporarily
 - Mainly affects cheeks, ears, and nose
 - Fully reversible and does not cause tissue loss with treatment

What to Look For

- Yellow to gray skin color
- Frost (ice crystals) on the skin
- Initial tingling or numbness that may become painful

What to Do

1. Get the person out of the cold and to a warm place.
2. Gently warm the affected area by placing it against a warm body part (eg, have the person put bare hands under the armpits) or by applying a warm chemical heat pack covered by a cloth. For the nose, breathe with cupped hands over the nose.
3. **DO NOT** rub the area.

Poison Ivy, Poison Oak, and Poison Sumac

Reactions (1 of 4)

- Poison ivy: every state except Hawaii and Alaska
- Poison oak: some eastern states and along West Coast
- Poison sumac: swampy areas of East Coast, especially Southeast



Figure 6-5

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Figure 6-6

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Figure 6-7

Courtesy of U.S. Fish & Wildlife Service

Poison Ivy, Poison Oak, and Poison Sumac Reactions (2 of 4)

- Exposure symptoms and treatment same for all plants
 - Rash not contagious
 - Self-limiting conditions; mild cases often disappear in about 2 weeks
 - Prescription medication may be needed for symptom relief



Figure 6-8

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Poison Ivy, Poison Oak, and Poison Sumac Reactions (3 of 4)

What to Look For	What to Do
Known contact within 5 minutes for people with sensitive skin and up to 1 hour for people with moderately sensitive skin	If within 5 minutes of an exposure: 1. Gently wipe skin with rubbing alcohol. DO NOT rub it in. DO NOT use packaged alcohol wipes, which can irritate the skin and contain too little alcohol to properly remove the irritant. 2. Next, or if rubbing alcohol is not available, wash the skin with lots of cold running water. Soap is not necessary, but if used, rinse with lots of cold running water. DO NOT scrub, rub, or scratch skin. DO NOT use gasoline.

Additional Treatment (Wilderness Medicine)

- a. If available, wash in cool water with a specialized soap like Tecnu or...
- b. Wash in cool water with a good dish soap like Dawn or any soap that helps get oil off your skin. It is the oil of the plant “**urushiol**” that is the irritant.
- c. Cashews are in the same “Sumac” family, this is why they never are available in the shell (it is an irritant)

Poison Ivy, Poison Oak, and Poison Sumac Reactions (4 of 4)

What to Look For	What to Do
Mild dermatitis: itching	1. Apply any of the following: • Colloidal oatmeal bath (eg, Aveeno Soothing Bath Treatments) • Baking soda paste (1 teaspoon [5 mL] water mixed with 3 teaspoons [15 mL] baking soda) • Calamine lotion • Aluminum acetate solution (eg, Burow's solution) • Over-the-counter hydrocortisone cream 2. Advise the person to avoid scratching the area. 3. Seek professional medical care if the discomfort is significant.
Moderate dermatitis: itching and swelling	■ Treat the same as for mild signs and symptoms. Seek professional medical care if the discomfort is significant.
Severe dermatitis: itching, swelling, and blisters	■ Seek professional medical care. ■ Seek emergency care if the person inhales smoke from a burning plant or if the reaction involves the face, eyes, genitals, or large areas of the body.

Arthropod Bites and Stings (1 of 7)

- Arthropods include insects, scorpions, spiders, and ticks
 - Stings of bees, wasps, fire ants range from mild annoyance to life-threatening anaphylactic shock
 - All spiders are venomous, but black widow and brown recluse only species dangerous to humans
 - Scorpion stings are very painful, but only bark scorpion is dangerous
 - Ticks not venomous, but can spread several diseases

Arthropod Bites and Stings (2 of 7)

Arthropod	What to Look for	What to Do
Stinging insects ■ Honeybee ■ Bumblebee ■ Hornet ■ Yellowjacket ■ Wasp ■ Fire ants	■ Usual reactions: instant pain, redness, itching ■ Worrisome reactions: hives, swollen lips/tongue, “tickle” in throat, wheezing ■ Life-threatening reactions: blue/gray skin color, seizures, unresponsiveness, inability to breathe because of swollen vocal cords ■ About 60% to 80% of anaphylactic deaths are caused by the victim’s inability to breathe because of swollen airway passages.	1. Call 9-1-1 if signs of a life-threatening condition are found or if the person indicates they have a serious allergy. If the person has a prescribed epinephrine auto-injector or nasal spray, help them to administer it. 2. Look for a stinger and, if found, remove it as soon as possible (eg, brush off with your hand or scrape it with a fingernail). DO NOT use tweezers. Only honeybees leave their stinger embedded. 3. Wash with soap and water. 4. Apply cold to the area. Baking soda paste may help with pain (except for wasp stings). 5. Give pain medication. Apply hydrocortisone cream (1%) and give antihistamine (Benadryl). 6. A sting in the throat or mouth can cause swelling, blocking the airway even in a person without an allergy; have the person suck on ice or flush the area with cold water.

Traditional advice warned against tweezers out of fear that squeezing would pump more venom into the skin. However, modern clinical studies analyzed by organizations like the [National Institutes of Health](#) show that the venom sac continues to pump automatically, so removing it instantly via any tool prevents the most harm.

Arthropod Bites and Stings (3 of 7)

Arthropod	What to Look for	What to Do
Black widow spider bites Also known as the widow spider. Only adult females bite. Depending on the species, may appear black, brown, or gray. They have a shiny abdomen with a red or yellow spot that is often in shape of hourglass, or white spots or bands on the abdomen.	■ May feel sharp pinprick followed by dull, numbing pain ■ Two small fang marks seen as tiny red spots ■ Severe abdominal pain (bites on arm can produce severe chest pain, thus mimicking a heart attack) ■ Headache, chills, fever, heavy sweating, nausea, and vomiting	1. Clean with soap and water. 2. Apply cold to the area. 3. Seek professional medical care immediately.  A close-up photograph of a black widow spider on its web. The spider has a black, shiny body with a prominent red hourglass-shaped mark on its abdomen. It is positioned on a delicate, white spider web that is stretched between some dry, brownish plant matter.

© Sari Oneal/Shutterstock.

(about 1-1/2 % of Black Widow Spider bites are fatal)

Arthropod Bites and Stings (4 of 7)

Arthropod	What to Look for	What to Do
Brown recluse spider bites Also known as fiddleback spider, violin spider, and brown spider. 	▪ Mild to severe pain occurs within 2 to 8 hours. ▪ A blister develops within 48 to 72 hours, becomes red, and bursts. It takes on a “bull’s-eye” appearance (FIGURE 6-9). ▪ Nausea, vomiting, headache, and fever	1. Same as for black widow spider. 2. Seek professional medical care immediately. 

Courtesy of Kenneth Cramer, Monmouth College.

Figure 6-9

Courtesy of the Department of Entomology, University of Nebraska-Lincoln

(**< 1% of Brown Recluse Spider bites are fatal**)

Arthropod Bites and Stings (5 of 7)

Arthropod	What to Look for	What to Do
Scorpion stings In the United States, only the bark scorpion found in Arizona is potentially deadly—it is active from May through August.	■ Immediate pain and burning around the sting site ■ Numbness or tingling occurs later.	1. Monitor breathing. 2. Wash with soap and water. 3. Apply cold to the area. 4. Give pain medication. 5. Apply dressing. 6. Seek medical help for severe reactions.

(Fatality rate for Bark Scorpion Stings is < 1% for adults, higher for infants, small children)

Arthropod Bites and Stings (6 of 7)

Arthropod	What to Look for	What to Do
Tick bites	▪ No pain initially exists, and the tick can go unnoticed for days without detection. ▪ Red area around tick means it has punctured skin and is feeding on victim's blood. ▪ If engorged with blood, it means there is an increased risk of disease transmission. ▪ May cause rash, fever, and chills ▪ The bite varies from a small bump to extensive swelling and ulcer.	Ticks are difficult to remove. Partial removal can lead to infection. 1. Use tweezers or a tick removal tool. Grasp the tick close to the skin and pull up, gently tenting the skin. Hold tension until the tick releases. DO NOT jerk or twist the tick (FIGURE 6-10). DO NOT use a hot match, fingernail polish, alcohol, petroleum jelly, or gasoline. 2. Wash the area with soap and water. 3. Apply cold to the area. 4. If tick was engorged, you cannot remove it, or the head remained embedded after the body is removed, seek medical advice (FIGURE 6-11). 5. Watch for signs of infection such as headache, fever, or rash appearing 3 to 30 days after the tick bite. If symptoms appear, seek medical advice.

Arthropod Bites and Stings (7 of 7)

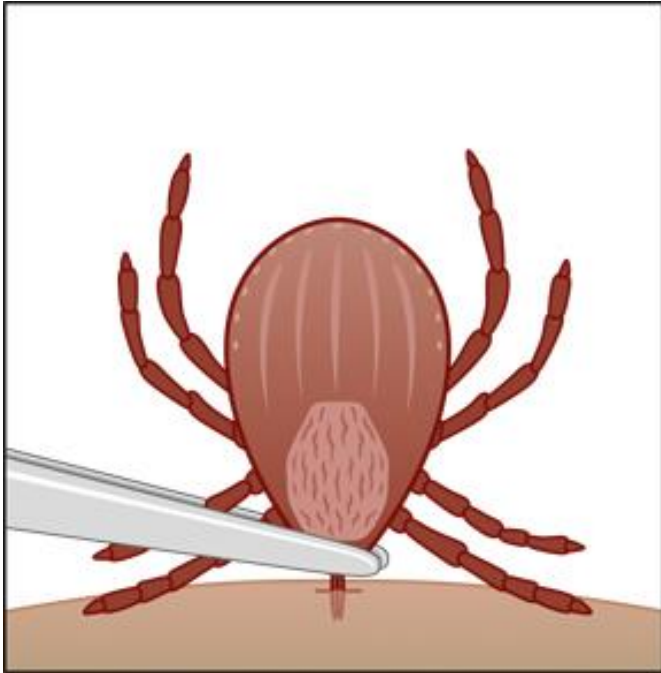


Figure 6-10

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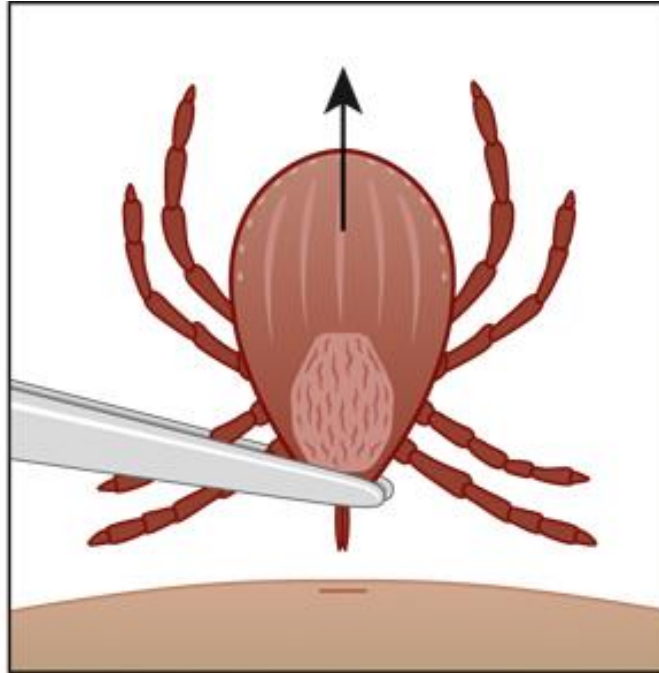


Figure 6-11

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Snakebites: Overview

- Four species of venomous snake in the U.S.
- At least one species of venomous snake in all states except Alaska, Hawaii, and Rhode Island

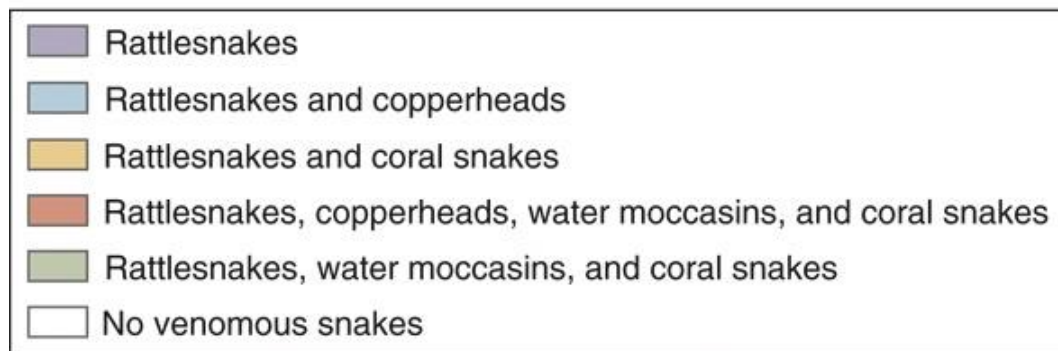
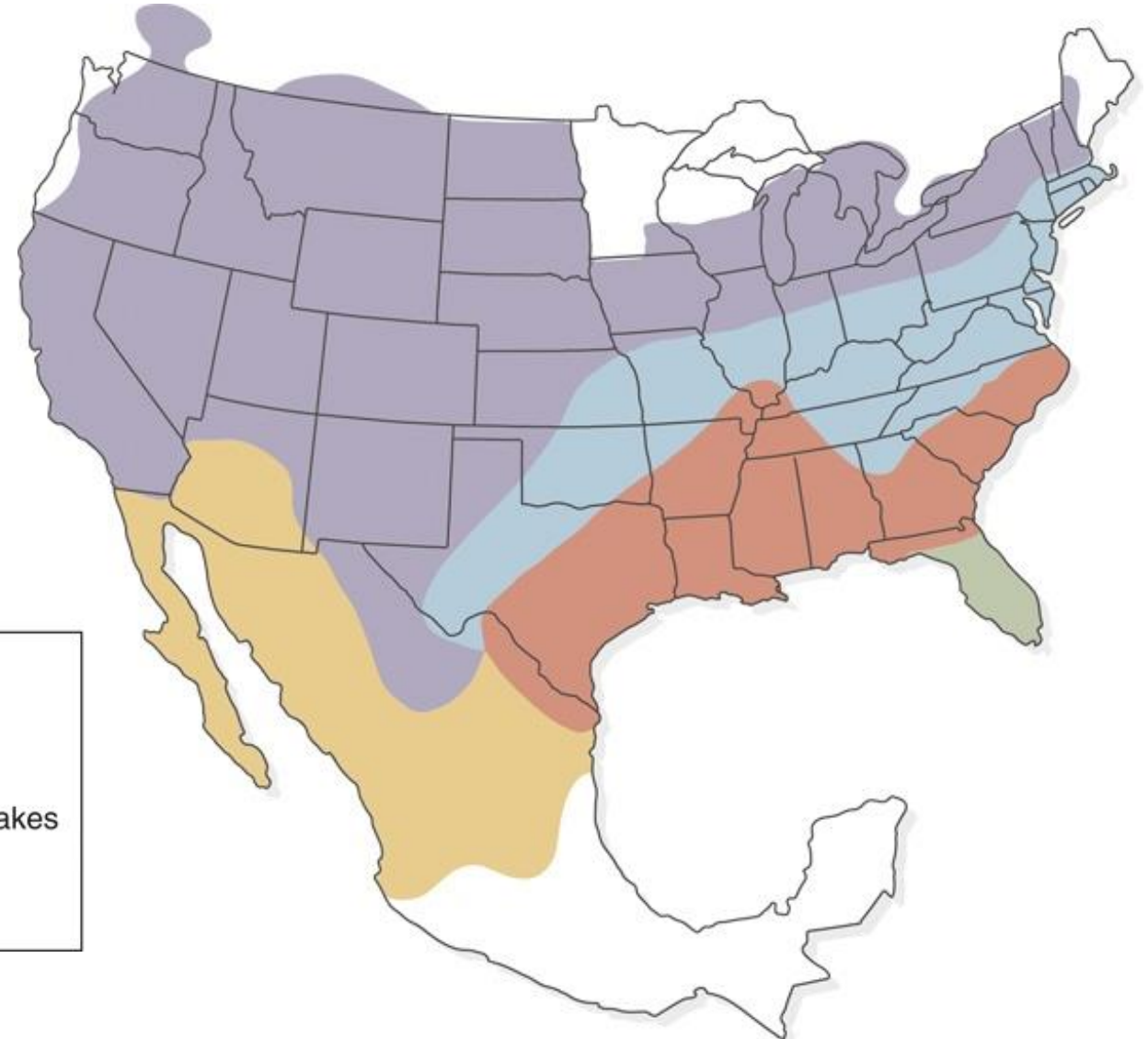


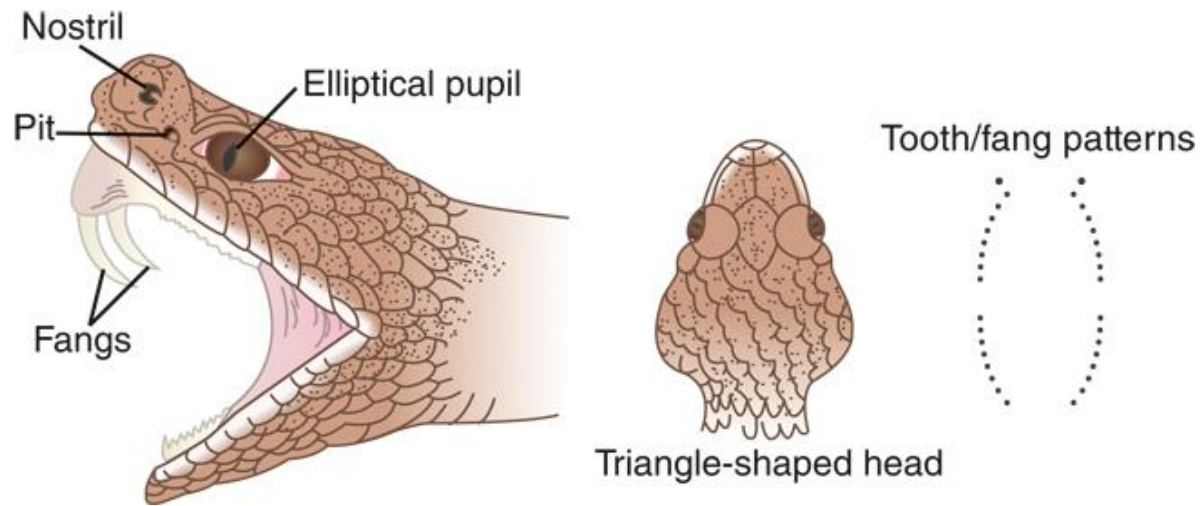
Figure 6-12

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Snakebites: Pit Vipers (1 of 3)

- Pit viper characteristics



- Non-venomous snake characteristics

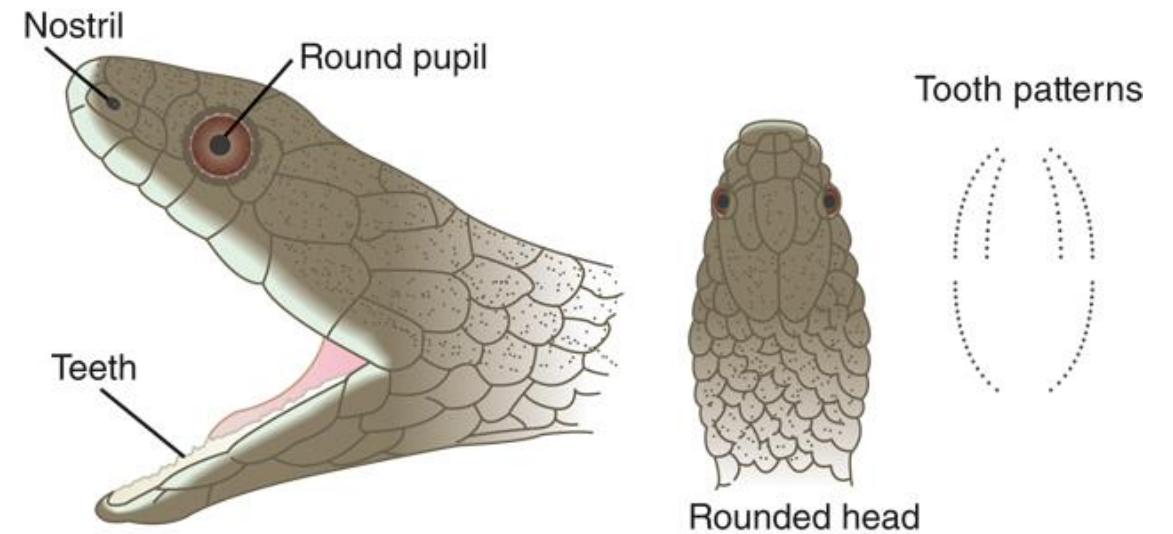


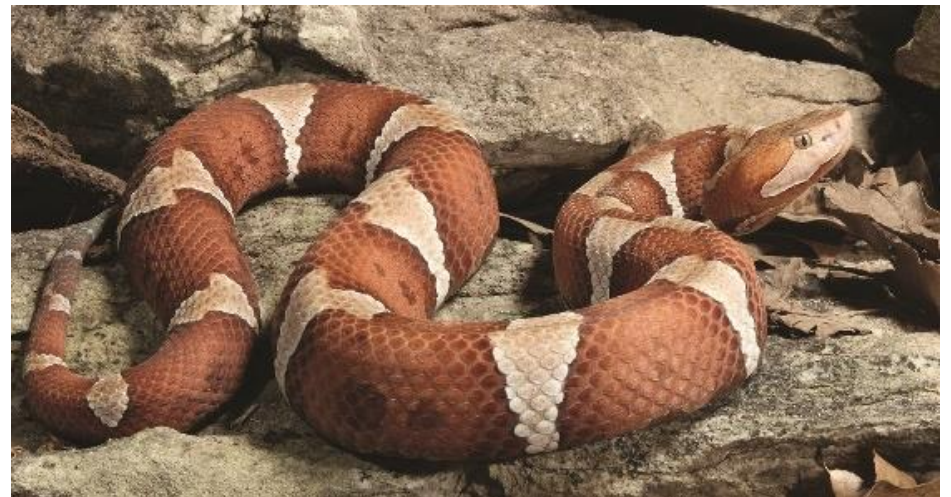
Figure 6-13

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Snakebites: Pit Vipers (2 of 3)

- Top left: rattlesnake
- Top right: cottonmouth (water moccasin)
- Bottom: coral snake

Best Treatment for Snake Bites!



Top left: © AmeeCross/Shutterstock

Top right: © Shackleford-Photography/Shutterstock

Bottom: © Dennis W. Donohue/Shutterstock

Snakebites: Pit Vipers (3 of 3)

What to Look for	What to Do
Severe, burning pain at the bite site - Two small puncture wounds (victim may have only one; FIGURE 6-14) - Swelling within 10 to 15 minutes; can involve entire extremity - Discoloration and blood-filled blisters possible in 6 to 10 hours (FIGURE 6-15). - Severe cases involve nausea, vomiting, sweating, and weakness.	1. Call 9-1-1. It is not necessary to capture or kill the snake. 2. Encourage the person to remain calm and still. If moving the person is necessary, carry them or have them walk slowly. 3. Remove any rings, jewelry, or tight clothing from the bitten body part to avoid constriction from swelling.



Figure 6-14
© Dorling Kindersley Ltd/Alamy
Stock Photo



Figure 6-15
© American Academy of
Orthopaedic Surgeons

Snakebites: Coral Snakes

What to Look for

- Few immediate signs
- Absence of immediate symptoms is not evidence of a harmless bite.
- Several hours may pass before the onset of:
 - Nausea
 - Vomiting
 - Sweating
 - Tremors
 - Drowsiness
 - Slurred speech
 - Blurred vision
 - Swallowing difficulty
 - Breathing difficulty

What to Do

1. Call 9-1-1.
2. For an arm or leg, apply snug—not tight—pressure by wrapping several wide elastic bandages (eg, Ace) over the bite site and entire extremity. Start near the hand or ankle and wrap up the extremity, past the bite site. The bandage should apply uniform pressure without cutting off circulation. Then, immobilize the limb with a splint (see Chapter 4).



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“Red touches Black - Venom Lack”
“Red touches Yellow – Kill a Fellow”

Snakebites: Pit Vipers and Coral Snakes

CAUTION



DO NOT apply cold or ice to a snakebite. 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 poor wound healing.

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

DO NOT use any form of suction. It is ineffective in removing venom.

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

DO NOT apply a constriction band—its use remains controversial. If applied too tightly or if swelling occurs, it can act as a tourniquet, which pools the venom in a single location, resulting in tissue damage.

DO NOT apply a pressure bandage for a pit viper snakebite. A number of toxicology associations and the Wilderness Medical Society's practice guidelines do not recommend the application of pressure bandages for pit viper snakebites. This action has not been proven to be beneficial.

Domestic Animal Bites (1 of 2)

- Most common source of bites in U.S. is domestic animals (dogs and cats)



Figure 6-16A

© E.M. Singletary, M.D. Used with permission



Figure 6-16B

© Charles Stewart MD, EMDM MPH

Domestic Animal Bites (2 of 2)

- Notify animal's owner and determine rabies vaccination status
 - DO NOT try to capture/kill animal
 - Contact local health department for advice

What to Look For	What to Do
Bite that has broken the skin ■ Puncture wound from the animal's sharp, pointed teeth ■ Crushed tissue and skin ■ Open wound on fingers, knuckles, and/or hand	1. Take standard precautions (see pp. 14–20). 2. Stop the bleeding (see Chapter 4). If bleeding cannot be stopped, call 9-1-1. 3. Rinse and bandage the wound. 4. Seek medical attention, as all bites that break the skin should be cleaned in a medical facility. Antibiotics, tetanus vaccination/booster, and/or rabies prophylaxis may also be required. In many states, health care providers are required to report animal bites to the local health department.
Bite that did not break the skin	Apply an ice pack to the skin for up to 20 minutes, placing a thin cloth between the skin and ice pack.

Human Bites (1 of 2)

- Can cause severe injury
- High risk of infection



Figure 6-17

© American Academy of Orthopaedic Surgeons

Human Bites (2 of 2)

What to Look For

There are two types of human bites.

1. True bite

- Part of the body's flesh is caught between teeth, usually deliberately.
- Occurs during fights and in cases of abuse (mandatory reporting laws apply if spousal or child abuse is involved; one child biting another is generally not reportable).

2. Clenched-fist injury

- Results from cutting a fist on teeth, usually during a fight (although unintentional injury can happen during sports and play).
- Associated with a high likelihood of infection
- Injury is usually a laceration over the knuckles.

What to Do

1. Take standard precautions (see pp. 14–20).
2. Control bleeding. If bleeding cannot be controlled, call 9-1-1.
3. Wash the wound with soap and water for 5 to 10 minutes. Avoid scrubbing, which can bruise tissues.
4. Flush the wound thoroughly with running water.
5. Cover the wound with a sterile dressing. **DO NOT** tape or use butterfly bandages. Closing the wound traps bacteria in the wound, increasing the chance of infection.
6. Seek professional medical care for wound cleaning, surgical care, and tetanus shot as needed.

Jellyfish Stings (1 of 2)

- Most sting by firing tiny, stinging barbs (nematocysts) from tentacles
 - Can discharge even if animal is dead or tentacle has been detached
 - Severity and care depend on species

Figure 6-18

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Jellyfish Stings (2 of 2)

What to Look For	What to Do
■ Severe burning and/or itching skin ■ Difficulty breathing ■ Nausea or vomiting ■ Headache ■ Muscle aches ■ Dizziness ■ Numbness ■ Seizure ■ Altered responsiveness	For North American species: 1. Move the person out of the water to a safer location. 2. Call 9-1-1 for difficulty breathing, signs of shock, severe bleeding, anaphylaxis, or severe pain. 3. Rinse the area with seawater to start removing nematocysts from the skin. DO NOT use fresh water. 4. With gloved hands, gently and quickly, remove tentacles using tweezers and/or picking them off the skin. DO NOT touch the tentacles or affected area with bare hands. 5. After tentacle removal, soak the affected skin in non-scalding hot water immersion or in a hot shower, or apply a heat pack to help relieve pain. This step can be repeated for pain control but use caution to avoid burning the skin. If it is not possible to apply heat, consider applying an over-the-counter lidocaine cream or gel. 6. DO NOT scrape, shave, or rub the tentacles off as this may cause any nematocysts on the skin to release more venom. DO NOT use the following unproven remedies: human urine, meat tenderizer, alcohol, baking soda, compression bandage, or cold pack. Controversy exists about using vinegar.