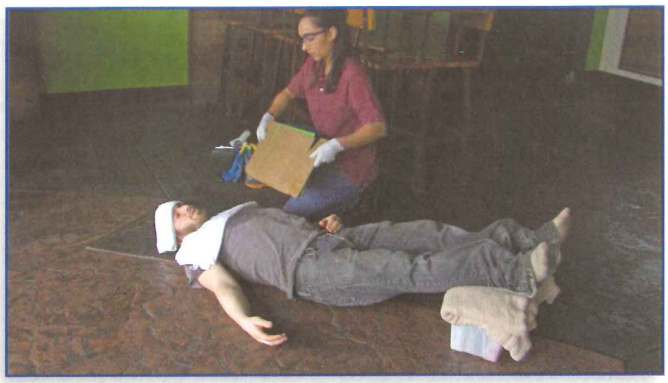
- Have the person lie down. If the person is uninjured, consider raising his or her legs 6 to 12 inches. Do not elevate the legs if it causes pain or the person is injured.
- Spray water on or apply cool, wet cloths to the head and torso. Use a fan to increase the cooling effect.
- If the person is able to follow simple commands and swallow without trouble, encourage the person to drink fluids, preferably a carbohydrate-electrolyte sports drink. Use water if a sports drink is not available. Do not give anything to drink if the person is confused or he or she has difficulty swallowing.



In most cases, the person's condition will gradually get better. If the person does not improve or seems to get worse, activate EMS.

Heat Cramps

Heat cramps are uncontrollable muscle spasms that can affect the calves, arms, abdominal muscles, and back. They can occur suddenly and be very painful.

Stretching and direct pressure to the cramping muscle may help. Delay further activity until the cramping has been resolved.

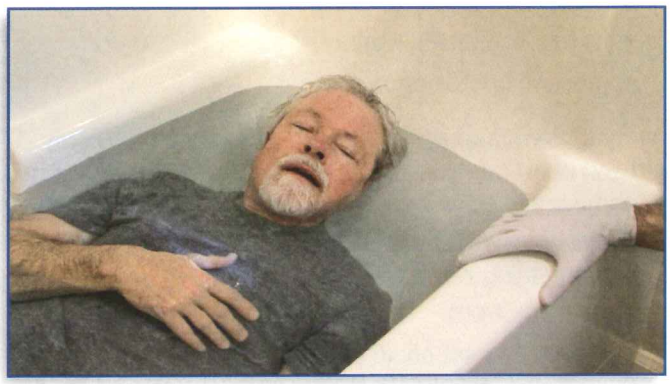
Heat Stroke

Heat stroke is a condition in which body temperature rises because the body's normal cooling systems are overwhelmed, or simply shut down as a result of extended exposure to a hot environment. It is a serious medical emergency and can quickly cause permanent damage to the brain.

- The person will be very warm, even hot to the touch.
- Heavy sweating could be present, but in many cases the skin can be red and completely dry.
- Typically, the person will be confused and could have trouble communicating.
- The person may become unresponsive and could experience a seizure.

Activate EMS immediately. The most important action a first aid provider can take is to begin immediate cooling with the resources available:

- When possible, the best method for cooling is to immerse the person up to the chin in cold water.
- If immersion is not possible, spray or pour cold water on the person, and fan him or her to increase cooling effect.
- Apply cold packs to the neck, groin, and armpits.
- Cover the person with a cold, wet sheet, and use a fan to enhance cooling.
- Provide continuous cooling until EMS personnel take over care.



With early recognition and effective cooling, most people suffering from heat stroke will survive.

Knowledge Check

You are volunteering as a first aid provider at your city's annual 10K run. Most runners have finished but a few are still trickling in. You see in the distance a runner being helped to walk, when he suddenly falls to his knees. You grab your first aid bag and run out to see if you can help. Your primary assessment shows he is very confused. His skin is sweaty, but surprisingly hot to your touch. What should you do for him?

Cold Emergencies

A cold or cool, wet environment can result in a lowering of internal body temperature. Hypothermia and frostbite are the most dangerous cold-related conditions.

Hypothermia

Hypothermia, a generalized cooling of the body, occurs when the internal core body temperature has decreased to 95°F or less. It can be a life-threatening condition.

Look for early signs of hypothermia, such as the following:

- Pale, cold skin
- Uncontrollable shivering
- Loss of coordination

As hypothermia progresses, shivering may stop. Breathing and heart rate slow down. Body processes can become impaired and may fail.

- Remove wet clothing and cover person with something warm and dry.
- Activate EMS.
- Cardiac arrest could occur. Get an AED if one is accessible.
- To care for the person, move him or her to a warmer place. Move the person slowly and without rapid movements.
- Cover the head and neck to retain body heat.

If you are far from professional medical care, begin actively rewarming the person. Place him or her near a heat source. Put containers of warm, but not hot, water in contact with the person's skin.

It is best to recognize and treat hypothermia early. The chance for survival decreases as the condition progresses.

Frostbite

Frostbite occurs when skin and underlying body tissue freezes. Body parts that are commonly exposed to extreme cold, such as the fingers, toes, earlobes, cheeks, and nose, are the most likely to be affected.

Lowering tissue temperature, prior to freezing, may cause a pins-and-needles sensation and throbbing.

Freezing could be prevented by using a simple skin-to-skin rewarming technique, such as holding the affected part in a warm hand.

Signs of freezing include a loss of feeling in the affected part and firm, pale, cold, numb skin.

If you suspect frostbite, quickly get the person to a warmer place. When EMS is close, or there is any chance that the part may refreeze, do not try to rewarm the frostbitten area.

- Remove any wet clothing.
- Do not rub or massage the affected area or disturb blisters on frostbitten skin.
- Remove all jewelry from the affected areas.
- Place clean pads between frostbitten fingers and toes.
- Wrap the affected part with a clean towel or pad.
- Keep the affected part still and protected. Provide ongoing reassurance until EMS providers can take over care.

If you are far from professional medical care, and there is no chance refreezing will occur, rewarm the affected part yourself:

- Immerse the frostbitten area in warm water for 20 to 30 minutes. The water should be warm, not hot – just above normal body temperature.
- Check and maintain the water temperature often.
- Severe burning pain, swelling, blistering, and color changes may occur.

Chemical warmers can reach temperatures that result in burns. They should not be used to rewarm frostbitten tissue.

Do not let the person use the affected part after it is thawed. Get him or her to professional medical care as soon as you are able.

Knowledge Check

You are trying to wrap up some repairs at an outside job site with another electrician. It has been a miserable rainy day and the temperature is going down late in the day. Your partner did not prepare as well as you did for the cold, rainy conditions and his light cotton clothes have been completely soaked through. You look up at him from a repair you have been concentrating on. It looks like he is having trouble grasping his pliers and is visibly shivering. You ask him if he is okay and he has trouble responding to you. What do you suspect may be occurring?

Stinging Insects

Many insects such as bees, wasps, and fire ants may sting when agitated or in defense of their nests or territories.

While wasps and fire ants can sting repeatedly, the stinger of a honey bee detaches from its body, remains embedded in the skin, and continues to inject venom.

- If a stinger is present in the skin, remove it as quickly as possible.
- Local pain, redness, swelling, and itching generally occur at the sting site.
- In general, care for bites and stings by washing the site with soap and water.
- As a precaution for swelling, always remove jewelry from the affected area.
- Cover the area with an adhesive bandage or a pad.
- Use local cooling to help reduce swelling and pain.

It is possible for a life-threatening allergic reaction to develop. Monitor for at least 30 minutes to see if condition worsens.

If you think someone is developing a severe allergic reaction, immediately activate EMS. If the person affected has an epinephrine auto-injector available, assist the person in self-administration.

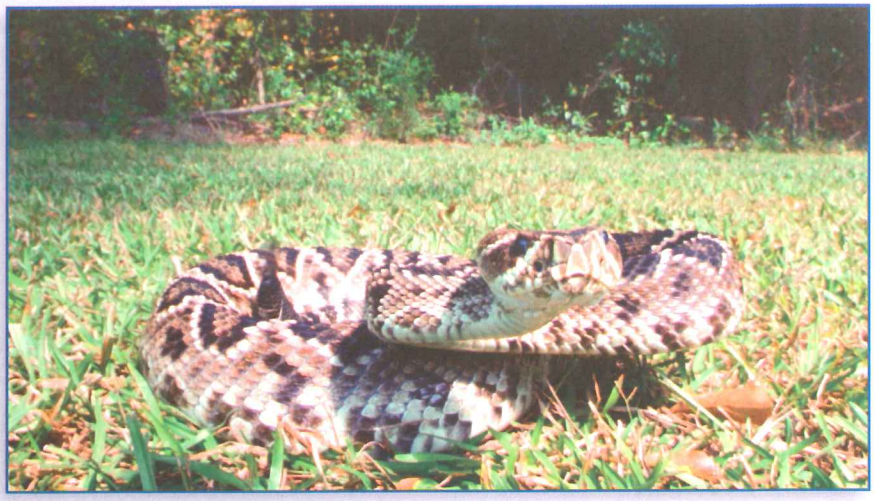
Additional Information

Infectious diseases can be transmitted through insect stings. The latest information on this can be found by visiting the U.S. Centers for Disease Control and Prevention website at www.cdc.gov.

Knowledge Check

You and a coworker are outdoors at lunch when she suddenly shouts that something stung her. You look at her forearm and see a stinger that is still embedded in her skin. What should you do?

Snakebites



Only a few types of venomous snakes are found in North America. Very few of the snakebites that occur are fatal. However, because fatalities have occurred, a suspected venomous snakebite should be considered and treated as a medical emergency.[7]

Pit Viper

Venomous cottonmouths, copperheads, and rattlesnakes are known as pit vipers. Pit vipers strike once and leave a characteristic bite with single or double fang mark. Pit viper bites can cause intense, burning pain and rapid local swelling.

If you suspect a pit viper bite, reassure the person that effective medical treatment is available.

- Have the person sit still and stay calm to slow the spread of venom within the body.
- Activate EMS.
- Remove any rings, or other constricting items from the affected limb.
- Control any bleeding with a clean pad and direct pressure.
- Immobilize the injured part and keep it below heart level.
- Do not apply a tourniquet, cold compresses, or try to suck out the venom by mouth.
- Keep the person warm, reassured, and quiet until EMS providers can take over.

Coral Snake

A venomous coral snake bite differs from that of a pit viper. Instead of a single strike, coral snakes will chew with fixed fangs.

Pain and swelling at the bite site may be minimal or absent. Serious effects are often delayed. When they do appear, symptoms can include the following:

- Abdominal pain
- Nausea and vomiting
- Rapid heartbeat
- Difficulty breathing
- Drooling
- Altered mental status

If you suspect a coral snake bite, have the person sit still and remain calm.

- Activate EMS.
- To slow the spread of venom, apply a pressure bandage around the entire length of the bitten extremity. Wrap toward the body. The bandage should be snug, but not so tight that you can't slip a finger under it.
- Immobilize the injured part and keep it below heart level.
- As with pit vipers, do not apply local cooling.
- Do not try to suck out the venom or use a tourniquet. These treatments are not effective and may be harmful.
- Keep the person warm, reassured, and quiet while awaiting EMS. Move the person only if needed.

Knowledge Check

You and a coworker are doing landscape maintenance when he shouts and scrambles out from behind some bushes. He says he was bitten by a snake and shows you his calf, which appears to have has a double fang mark on it. What type of snake do you suspect was involved?

Spider Bites

Spiders typically inhabit out-of-the-way places such as wood piles or out buildings. There are certain spiders that can be dangerous to humans; these include the black widow and the brown recluse.

Initially, venomous spider bites are often difficult to identify.

- Small puncture marks and bleeding may be seen.
- Tenderness, swelling, pain, itchiness, and redness at the bite site can develop.
- Over time, cramping pain and muscular rigidity in the body may occur.
- A person may experience fever, weakness, nausea and vomiting, or difficulty breathing.

If you suspect a severe reaction from a spider bite, activate EMS. Keep the person warm, reassured, and quiet while awaiting EMS.

Knowledge Check

You are working with another contractor in an old storage shed when he reacts to a sudden burning sensation on his leg. Due to the dim light, you cannot see anything. When you get outside, there is a small red mark that itches but does not worry him. If he was bitten by a poisonous spider, what may happen?

Tick Bites

Ticks are blood-feeding insects that are typically found in tall grass and shrubs. When a tick bites, it attaches itself firmly to the skin. The biggest concern with tick bites is the exposure and transmission of infectious disease, most notably Lyme disease.

- To remove an embedded tick, grasp it close to the skin with tweezers or a tick removal tool.
- Pull straight up with a steady, slow motion.
- After removal, clean the area well with soap and water or a disinfecting wipe. When finished, thoroughly wash your hands.

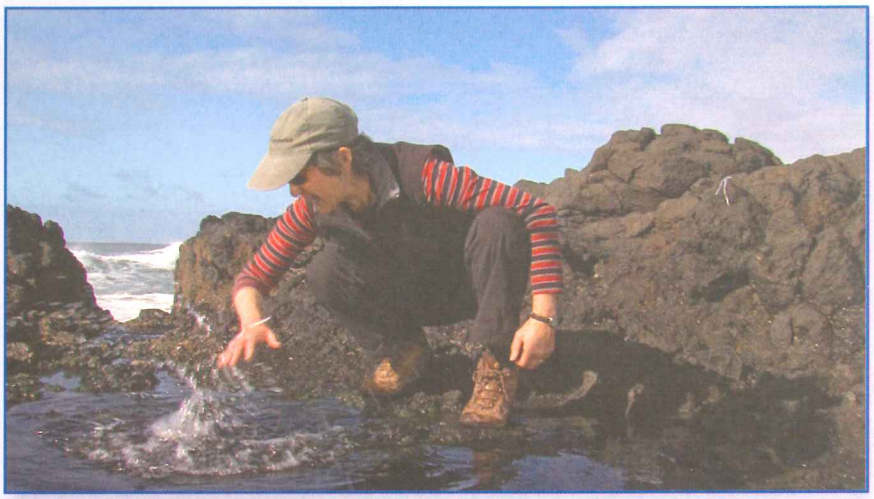
If portions of the tick remain in the skin or you develop a rash or flu-like symptoms, seek further medical attention.

Do not use fingernail polish, petroleum jelly, a glowing hot match, or alcohol to remove a tick. These actions have no proven value and may cause additional problems.

Knowledge Check

What is the biggest concern with a tick bite?

Marine Animal Stings



Stings from marine animals, such as fire coral, sea anemones, and jellyfish, can occur when a person is in or around the ocean environment.

Jellyfish

Stings can result in significant pain at the sting site and a raised, red, itchy rash. Wash the sting site liberally with household vinegar as soon as possible for at least 30 seconds to deactivate the venom and prevent further stinging.

To help reduce pain, shower or immerse the sting site with hot water for at least 20 minutes or until the pain subsides. The water should be as hot as the person can safely tolerate.

Stingray

A stingray is a marine animal with a slender tail and venom-filled spines that can puncture the skin and inject venom.

Intense pain can occur at the sting site. Immerse the injured area in water as hot as the person can tolerate for 30 to 90 minutes to deactivate the venom and help relieve pain. Carefully clean out the wound site.

Severe reactions to marine animal stings can include difficulty breathing, heart palpitations, weakness, and fainting. If this occurs, activate EMS immediately. Monitor closely and be prepared to quickly provide supportive care until EMS personnel take over.

Knowledge Check

You are collecting water samples in a tide pool with a coworker when she reaches her hand into the pool and is stung by a jellyfish. What two treatment techniques will help to prevent and relieve pain at the sting site?

Animal and Human Bites

Animal bites can cause significant injury and bacterial infection. Human bites are also of concern.

Bites from animals such as raccoons, skunks, bats, and foxes can also cause rabies. Left untreated, rabies is fatal.

- Control any bleeding with direct pressure.
- Wash the bite and flush with large amounts of water.
- Due to the chance of infection, any animal or human bite that breaks the skin should be evaluated by a medical professional.

Knowledge Check

What is the main concern related to bites from animals like raccoons, skunks, bats, and foxes?

Emotional Considerations

Caring for someone in an emergency can create emotional distress. Exposure to an extreme situation or having a close relationship with those involved can intensify these feelings.

Common reactions include the following:

- Anxiety
- Trembling or shaking
- Sweating
- Nausea
- Fast breathing
- Pounding heartbeat

This is a normal human reaction to a traumatic event. Calm yourself as best you can and acknowledge your limitations as a provider.

When an emergency is over, a provider is often left alone while an ill or injured person is quickly transported away by EMS. With limited time for closure, you can begin to experience a variety of reactions. These may include the following:

- Feeling abandoned or helpless
- Recalling the event over and over
- Self-doubt about not doing enough
- Difficulty concentrating
- Heaviness in the chest
- Upset stomach or diarrhea
- Difficulty sleeping or nightmares

These feelings are normal and should pass with time. However, there are actions you can take to help work through the difficulty:

- Share your feelings.
- Talk with someone you trust to listen without judgment, such as a family member, friend, or coworker.
- Get back to a normal routine as soon as possible.
- Accept that it will take time to resolve these emotions.

If unpleasant feelings persist, formal assistance from a professional counselor may be helpful as you deal with your emotions about the event.

Knowledge Check

You responded as a first aid provider to a coworker who experienced a life-threatening allergic reaction to a bee sting. She has been transported by EMS to a hospital for further care. The experience was overwhelming, and you still have not heard if her condition has improved. The experience has clearly left you shaken. You keep going over your actions in your head and wonder if you did enough. How can you help address the feelings you are having?

Glossary

abdominal thrust
Thrusts administered to the abdomen of a responsive, choking person to dislodge an object blocking a person's airway.

acute coronary syndrome (ACS)
Often described as a heart attack, ACS occurs when there is reduced blood flow to the tissues of the heart.

airway
The passageway between mouth and lungs that allows life-sustaining oxygen into the body.

altered mental status
A significant change in a person's personality, behavior, or consciousness, which may indicate a serious medical problem.

amputation
A complete loss of a body part.

anaphylaxis
A severe allergic reaction with an extreme response of the body's immune system to something it is very sensitive to.

arterial bleeding
A wound to an artery, which is characterized by bright red, oxygen-rich blood spurting from the wound.

asthma
Reactive airway disease, narrowing the small air passages in the lungs and causing difficulty in breathing.

bloodborne pathogens
Infectious microorganisms in human blood that can cause disease in humans. These pathogens include, hepatitis B (HBV), hepatitis C (HCV) and human immunodeficiency virus (HIV).

chest thrust
Thrusts administered on the breastbone of a responsive, choking person to dislodge an object stuck in the person's airway.

compression-only CPR
A simple, but limited, approach to treating sudden cardiac arrest that is being widely promoted to people who are not formally trained in CPR.

diabetes
A disease in which the body cannot effectively use sugar for energy, which can lead to life-threatening problems if not managed properly. A diabetic emergency is often characterized by an altered mental status.

direct pressure
Pressure applied directly to a bleeding site until bleeding stops. It is the standard method for controlling external bleeding.

dislocation
The separation of bone ends at a joint.

DOTS
Mnemonic device used to help with physical assessment:
- **D**eformities
- **O**pen injuries
- **T**enderness
- **S**welling

emergency action plan (EAP)
Used to help ensure safe and healthy conditions at work by provides step-by-step procedures on how to report and respond to emergencies.

emergency medical services (EMS)
An emergency medical response system developed within a community, consisting of a specialized communications network and trained professional responders, all accessible through an emergency phone number such as 911.

epinephrine auto-injector
A prescribed medication device with a spring-loaded needle, designed for easy use by a minimally trained person. Intended for use in treating a life-threatening allergic reaction, it delivers a measured single dose of epinephrine.

evisceration
The protrusion of abdominal organs through an open abdominal wound.

FAST
Mnemonic device used to help with stroke assessment:
- Face droop
- Arm drift
- Speech difficulty
- Time to activate EMS

fracture
A break in a bone.

frostbite
The freezing of skin and underlying body tissue in extremely cold conditions.

Good Samaritan law
A law enacted to legally protect trained providers who voluntarily stop to help, act prudently, do not provide care beyond training, and are not completely careless in delivering emergency care.

head tilt-chin lift

The recommended technique to open and maintain the airway of an unresponsive person. It pulls the jaw forward and lifts the tongue away from the back of the throat.

heart attack

See *acute coronary syndrome.*

hypoglycemia

Low blood sugar. A diabetic condition that can rapidly develop and become life threatening.

hypothermia

A generalized cooling of the body that is a life-threatening condition, occurring when the internal core body temperature has decreased to 95° F or less.

impaled object

An object that penetrates a body part and remains embedded.

implied consent

A legal concept referring to the assumption that an unresponsive person would give permission to be helped if responsive.

internal bleeding

A condition in which an injury causes bleeding inside the body, which can be difficult to detect. If it goes untreated, it can lead to shock and become a life-threatening problem.

mechanism of injury

A concept used by first aid providers to quickly suspect injury due to evidence that significant force has impacted a person's body.

primary assessment

An initial approach to quickly identify if a life-threatening condition is present.

protective barrier

An item that helps reduce the risk of exposure to blood and other potentially infectious body fluids. Examples include disposable gloves, CPR masks, and face shields.

recovery position

A side-lying position in which an unresponsive breathing person is placed to drain fluids from the mouth and keep the tongue from blocking the airway.

SAMPLE

Mnemonic device used to help providers remember what to ask a person about:

- **S**ymptoms
- **A**llergies
- **M**edications
- **P**ast medical history
- **L**ast oral intake
- **E**vents leading to problem

secondary assessment

Used when there are no life-threatening conditions to gather additional information about the person's chief complaint, physical signs, and additional information related to what is going on.

seizure

Jerking or convulsive activity of the body triggered by excessive electrical activity within the brain.

shock

A life-threatening condition that develops when poor blood flow creates a shortage of oxygen to body tissues.

spinal motion restriction

The use of the hands to gently hold both sides of the head to restrict spinal. Done to prevent additional damage from a suspected spinal injury.

splint

A device used externally to immobilize a painful, swollen, or deformed limb in order to decrease pain and prevent further injury.

sprains

Tearing injuries to ligaments that hold joins together.

standard precautions

A consistent set of protective practices used whether or not an infection is suspected. The approach is the same for everyone, regardless of relationship or age.

strains

Stretching or tearing injuries to muscles or tendons.

stroke

Sudden brain cell death caused by the loss of oxygen to brain tissue either by a blockage in a blood vessel or bleeding into brain tissue when a weak blood vessel wall bursts open.

tourniquet

A binding device used on a limb above a heavily bleeding wound to control bleeding.

unresponsive

A condition in which a person does not respond to physical or verbal attempts to get a response.

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The ASHI Basic First Aid Student Book is based upon the following standards, guidelines, and recommendations:

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