

Head and Spinal Injuries

Head Injuries

Any head injury is potentially serious. If not properly treated, injuries that seem minor could become life threatening. Head injuries include scalp wounds, skull fractures, and brain injuries. Spinal injuries (that is, neck and back injuries) can also be present in head-injured victims.

► Scalp Wounds

The scalp has many blood vessels, so any cut can cause heavy bleeding. A bleeding scalp wound does not affect the blood supply to the brain.

Care for Scalp Wounds

To care for a scalp wound:

1. Apply a sterile or clean dressing and direct pressure to control bleeding **(Figure 7-1)**.
2. Keep the victim's head and shoulders slightly elevated to help control bleeding if no spinal injury is suspected.
3. Seek medical care.

Meeting OSHA Recommendations

This chapter and the accompanying research cover the following OSHA Best Practices Guide, *Requirements of a Workplace Fall Protection Program* (2006).

5. Responding to Non-Life-Threatening Emergencies

- Musculoskeletal injuries
 - Head, neck, back and spinal injuries
- Eye injuries
 - First aid for eye injuries
 - First aid for chemical burns
- Mouth and teeth injuries
 - Oral injuries, lip and tongue injuries, broken and missing teeth
 - The importance of preventing aspiration of blood and/or teeth



Figure 7-1

Apply direct pressure and a bandage to control bleeding.



There is no need to keep a concussion victim awake. This was previously recommended to observe a person for any changes after a concussion. The concern was that the victim may go into a coma; however, this is no longer believed to be true.

Once a person has had a concussion, he or she is as much as four times more likely to sustain a second one. After a concussion, it takes less of a blow to cause another concussion and requires more time to recover.

► Skull Fracture

Skull fracture
Break of part of the skull (the bones).

Significant force applied to the head may cause a **skull fracture**. This occurs when part of the skull (the bones forming the head) is broken.

Recognizing Skull Fracture

Signs of skull fracture include the following:

- Pain at the point of injury
- A break in or deformity of the skull
- Loss of responsiveness
- Drainage of clear or bloody fluid from the ears or nose
- Heavy scalp bleeding (A scalp wound may expose the skull or brain tissue.)
- Penetrating wound, such as from a bullet or an impaled object

Care for Skull Fracture

To care for a skull fracture:

1. Check responsiveness and breathing and provide any necessary care.
2. Control any bleeding by applying a sterile or clean dressing and applying pressure around the edges of the wound, not directly on it

Figure 7-2

3. Stabilize the head and neck to prevent movement.
4. Call 9-1-1.

► Brain Injuries

The brain can be shaken by a blow to the head. A temporary disturbance of brain activity known as a **concussion** can result. Most concussions are mild, and people recover fully, but this process takes time. Concussions do not involve bleeding under the skull or swelling of brain tissue.

Concussion
A temporary disturbance of brain activity caused by a blow to the head.

Recognizing Brain Injury

Signs of brain injury include the following:

- Befuddled facial expression (vacant stare)
- Slow to answer questions or follow directions
- Unaware of where they are or day of week (amnesia)
- Slurred speech
- Stumbling, inability to walk
- Loss of responsiveness
- Complaints of headache, dizziness, and nausea within minutes or hours of injury
- Making repetitive statements or asking the same questions over and over again

Care for Brain Injuries

To care for a brain injury:

1. Check responsiveness and breathing and provide any necessary care.
2. Stabilize the head and neck to prevent movement.
3. Control any scalp bleeding with a sterile or clean dressing and direct pressure. If you suspect a skull fracture, apply pressure around the wound edges, not directly on the wound.

4. If the victim vomits, roll the victim onto his or her side to keep the airway clear, moving the head, neck, and body as one unit.
5. Call 9-1-1.



Figure 7-2

Apply pressure around the edges of the wound to control bleeding from a suspected skull fracture.

Head Injury Follow-up

Seek medical care if any of the following signs appear within 48 hours of a head injury. These symptoms can be caused by excessive pressure on or in the brain.

- **Headache:** Severe headache, or one that lasts more than 1 or 2 days or gets worse
- **Nausea, vomiting:** Nausea that does not go away, or vomiting more than once
- **Drowsiness and confusion**
- **Vision and eye problems:** Double vision, eyes that do not move together, one pupil that appears larger than the other, or dilated pupils (larger than normal)
- **Mobility:** Weakness, numbness in arms or legs, or trouble walking
- **Speech:** Slurred speech or inability to talk
- **Seizures (convulsions)**

CAUTION

DO NOT stop the flow of fluid from the ears or nose. Blocking the flow of either could increase pressure inside the skull.

DO NOT elevate the legs—that might increase pressure on the brain.

DO NOT clean an open skull injury—infection of the brain may result.

Eye Injuries

An eye injury can produce severe lifelong complications, including blindness if not treated promptly. When in doubt about an injury's severity, seek medical care.

► Foreign Objects in Eye

Many different types of objects can enter the eye and cause significant damage. Even a small foreign object, such as a grain of sand, can produce severe irritation.

Care for Loose Foreign Objects in the Eye

Try one or more of the following techniques to remove the object **Figure 7-3**:

1. Pull the upper lid over the lower lid, so that the lower lashes can brush the object off the inside of the upper lid.
2. Hold the eyelid open, and gently rinse with warm water.
3. Examine the lower lid by pulling it down gently. If you can see the object, remove it with moistened sterile gauze, clean cloth, or a moistened cotton swab.
4. Examine the underside of the upper lid by grasping the lashes of the upper lid and rolling the lid upward over a cotton swab. If you can see the object, remove it with moistened sterile gauze or a clean cloth.

CAUTION

DO NOT allow the victim to rub the eye.

DO NOT try to remove an embedded foreign object.

DO NOT use dry cotton (cotton balls or cotton-tipped swabs) or instruments such as tweezers to remove an object from an eye.

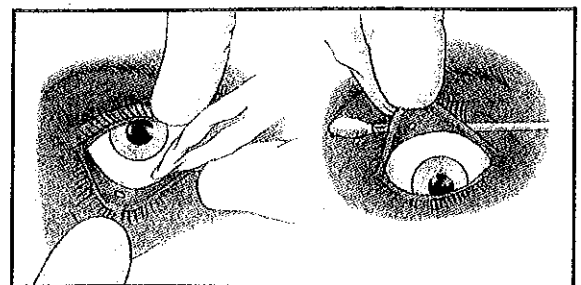


Figure 7-3

Locate and remove a foreign object from the eye.

► Penetrating Eye Injuries

Penetrating eye injuries result when a sharp object penetrates the eyeball and then is withdrawn or when an object remains embedded in the eye.

Care for Penetrating Eye Injuries

To care for a penetrating eye injury:

1. Stabilize long embedded objects with bulky dressings or clean cloths held in place

Figure 7-4

2. Ask the victim to close the uninjured eye.
3. Call 9-1-1.

► Blows to the Eye

Blows to the eye range from an ordinary black eye to severe damage that threatens eyesight **Figure 7-5**.

Care for Blows to the Eye

To care for a blow to the eye:

1. Apply an ice or cold pack for about 15 minutes to reduce pain and swelling. Do not apply it directly on the eyeball or apply any pressure on the eye.
2. Seek medical care if there is pain, double vision, reduced vision, or discoloration.

► Eye Avulsion

eye avulsion

Forcible separation of the eyeball from its socket.

An **eye avulsion** occurs from a blow to the eye that knocks the eyeball from its socket.

Care for Eye Avulsion

To care for an eye avulsion:

1. Cover the injured eye loosely with a sterile or clean moistened dressing. Do not try to push the eyeball back into the socket.
2. Protect the injured eye with a paper cup, held in place by tape.
3. Have the victim keep the uninjured eye closed.
4. Call 9-1-1.



Figure 7-4

Protecting a penetrating object against movement with a bulky dressing.



Figure 7-5

Blow to the eye.

► Cuts of the Eye or Lid

Cuts of the eye or lid require very careful repair to restore appearance and function **Figure 7-6**.

Care for Cuts of the Eye or Lid

To care for a cut of the eye or lid:

1. If the eyeball is cut, do not apply pressure on it. If only the eyelid is cut, apply a sterile or clean dressing with gentle pressure.
2. Have the victim keep the uninjured eye closed.
3. Call 9-1-1.

► Chemicals in the Eye

Chemical burns of the eye, usually caused by an acid or alkaline solution, need immediate care because damage can occur in as little as 1 minute. They may cause loss of vision.

Care for Chemicals in the Eye

To care for a chemical in the eye:

1. Hold the eye wide open and flush with warm water for at least 20 minutes, continuously and gently (Figure 7-7). Irrigate from the nose side of the eye toward the outside to avoid flushing material into the other eye.
2. Loosely bandage the eyes with wet dressings.
3. Call 9-1-1.

CAUTION

DO NOT try to neutralize the chemical. Water usually is readily available and is better for eye irrigation.

► Eye Burns from Light

Burns can result from looking at a source of ultraviolet light, such as a welder's arc or the glare off bright snow. Severe pain occurs several hours after exposure.

Care for Eye Burns from Light

To care for an eye burn from light:

1. Cover both eyes with wet dressings and cold packs. Tell the victim not to rub the eyes.
2. Seek medical care.

Nose Injuries

The nose often gets hit during sports activities, physical assaults, and motor vehicle crashes.

► Nosebleeds

Rupture of tiny blood vessels inside the nostrils by a blow to the nose, sneezing, or picking or blowing the nose causes most nosebleeds.

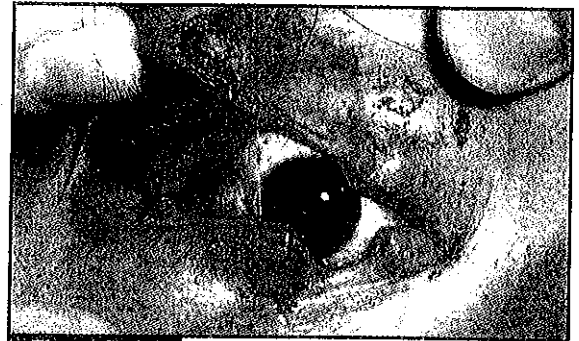


Figure 7-6

Lacerated eyelid.

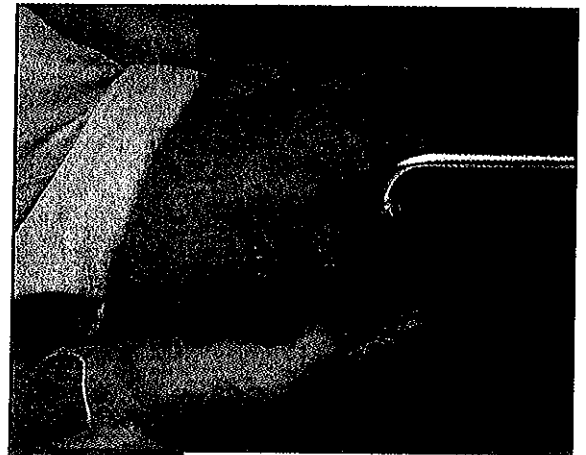


Figure 7-7

Flushing eye to treat a chemical burn.

There are two types of nosebleeds:

- **Anterior nosebleeds** (*front of nose*) are the most common type of nosebleed (90%) and are normally easily cared for.
 - anterior nosebleed**
Bleeding from the front of the nose.
- A **posterior nosebleed** (*back of nose*) involves massive bleeding backward into the mouth or down the back of the throat. A posterior nosebleed is serious and requires medical care.
 - posterior nosebleed**
Bleeding from the back of the nose into the mouth or down the back of the throat.

Care for Nosebleeds

To care for a nosebleed:

1. Place the victim in a seated position with the victim's head tilted slightly forward.
2. Pinch (or have the victim pinch) the soft parts of the nose between the thumb and two fingers with steady pressure for at least 5 to 10 minutes **Figure 7-8**.
3. Seek medical care if bleeding cannot be controlled or you suspect a broken nose.

► Broken Nose

A blow to the nose can break the nose.

Recognizing a Broken Nose

The signs of a broken nose include the following:

- Pain, swelling, or deformity
- Bleeding and breathing difficulty through the nostrils
- Black eyes appearing 1 to 2 days after the injury

Care for a Broken Nose

To care for a broken nose:

1. If bleeding, provide care as for a nosebleed.
2. Apply an ice or cold pack to the nose. Do not try to straighten a crooked nose.
3. Seek medical care.

Mouth Injuries

Mouth injuries can involve damage to the lips, tongue, and teeth. These injuries can cause considerable pain and anxiety.

► Bitten Lip or Tongue

Care for Bitten Lip or Tongue

To care for a bitten lip or tongue:

1. Apply direct pressure.
2. Apply an ice or cold pack.
3. If the bleeding does not stop, seek medical care.

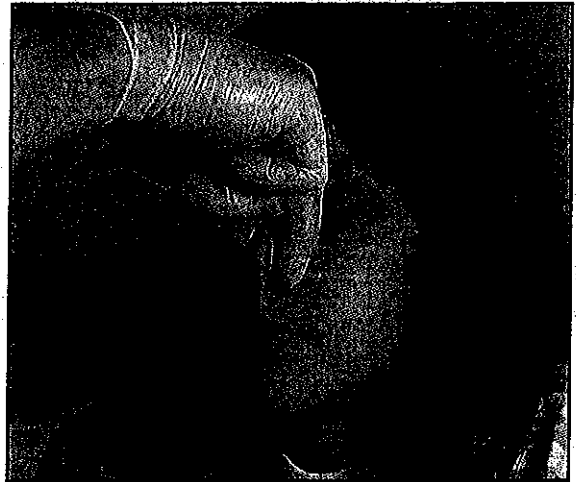


Figure 7-8

Control bleeding from the nose by pinching the nostrils together.

► Knocked-Out Tooth

A knocked-out tooth is a dental emergency **Figure 7-9**. For successful replantation of the tooth, it is important to locate the tooth and prevent it from becoming dried out, and to protect the ligament fibers on the roots from damage.

Care for a Knocked-Out Tooth

To care for a knocked-out tooth:

1. Place a rolled or folded gauze pad in the socket to control bleeding.
2. Handle the tooth by the crown, not the root.
3. Get the victim to a dentist promptly so the tooth can be successfully replaced in its socket. If more serious injuries exist, seek medical care.
4. The tooth should be kept moist. Several options exist:
 - If the victim is an adult and alert, the tooth can be laid inside the lower lip, between the teeth and lip.
 - If it is not possible to place the tooth in the mouth, have the victim spit into a cup, and place the tooth in the saliva.
 - If neither of the preceding options is possible, the tooth can be placed in whole milk or a saltwater solution ($\frac{1}{2}$ teaspoon salt in 1 quart of water). Use regular water if these options are not available.

EYI**Reinserting a Knocked-Out Tooth**

If you are in a remote area more than 1 hour away from definitive medical or dental care, you could rinse the tooth lightly and attempt to reinsert it. When rinsing the tooth, only rinse to remove the dirt—do not scrub the tooth.

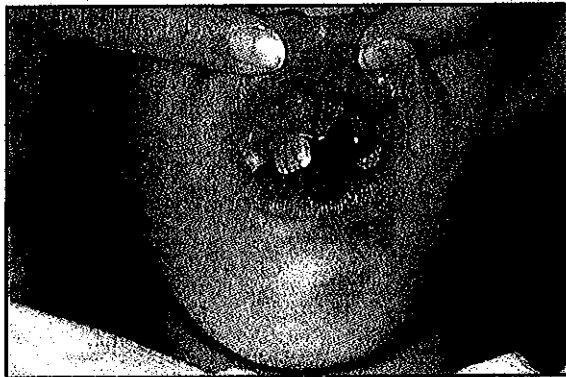


Figure 7-9

Tooth knocked out.

EYI**Other Dental Emergencies****Broken Tooth**

Rinse the mouth with warm water. Apply a cold pack to the outside of the cheek. Contact a dentist.

Objects Caught Between Teeth

Try to gently remove the object with dental floss. If the object cannot be dislodged, contact a dentist.

Toothache

Rinse the mouth with warm water. Gently use dental floss to remove any debris caught between the teeth. If the pain persists, contact a dentist.

CAUTION

Serious mouth injuries can sometimes result in unintentional sucking of fluid, food particles, blood, or broken teeth into the lungs (aspiration). Remove any loose objects from the mouth. If the victim can sit upright, this will allow drainage from the mouth. Otherwise roll the victim onto his or her side to help keep the airway clear.

Spinal Injuries

Motor vehicle crashes, direct blows, falls from heights, physical assaults, and sports injuries are common causes of spinal injury. Suspect spine injuries in victims with significant head injuries, because the two are often associated.

Recognizing Spinal Injuries

The signs of spinal injuries include the following:

- Inability to move the limbs
- Numbness, tingling, weakness, or burning sensation in the limbs
- Deformity (odd-looking angle of the victim's head and neck)
- Neck or back pain

Care for Spinal Injuries

To care for a spinal injury:

1. Stabilize the head and neck to prevent movement **Figure 7-10**.
2. Check responsiveness and breathing and provide any necessary care. If the victim vomits, roll the victim onto his or her side (recovery position) to avoid an airway blockage. This is best done with two first aiders.
3. Call 9-1-1.

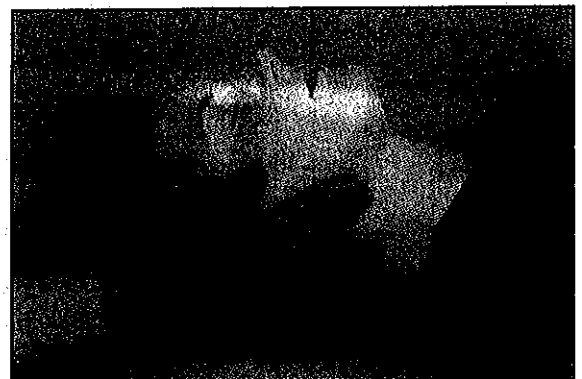
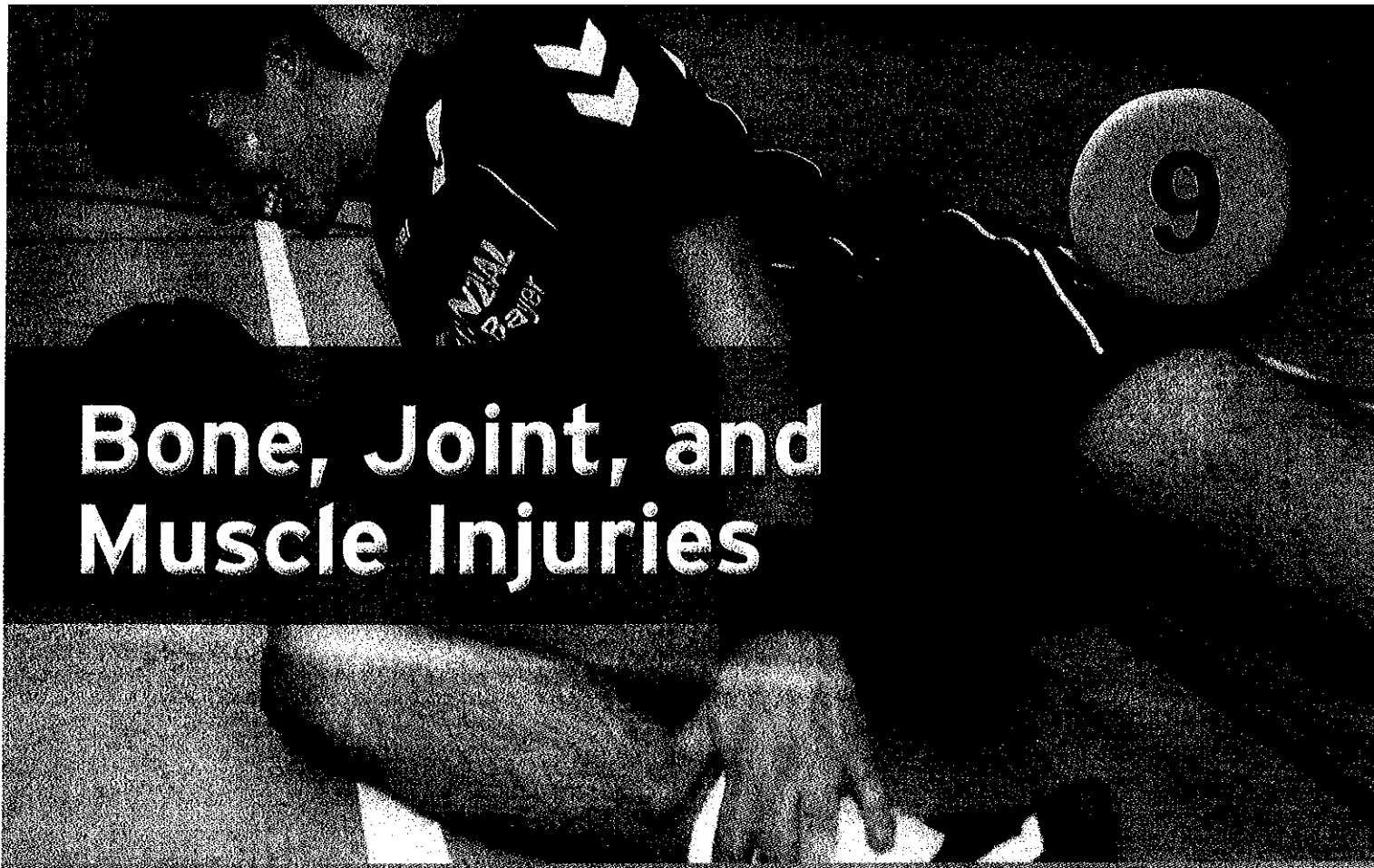


Figure 7-10

Prevent movement of the head and neck.



Bone, Joint, and Muscle Injuries

Meeting OSHA Recommendations

This chapter will help you comply with OSHA's recommendations for the following OSHA safety practices: *OSHA's Occupational Safety and Health Act of 1970*

5. Responding to Non-Life-Threatening Emergencies

• *Medical Aids (First Aid)*

• *First Aid*

• *Stabilizing Injuries, Controlling*

• *and Treating*

► Bone Injuries

fracture

Break in a bone.

closed fracture

A fracture with no open wound.

open fracture

A fracture with an open wound and possible protruding bone.

A **fracture** is a break or crack in a bone. There are two categories of fractures (Figure 9-1):

- **Closed fracture:** No open wound exists around the fracture site (Figure 9-2).
- **Open fracture:** An open wound exists, and the broken bone end may be protruding through the skin (Figure 9-3).

Recognizing Bone Injuries

It may be difficult to tell if a bone is broken. A good indication of a possible broken bone is the inability to use the injured part normally. The mnemonic DOTS can also be used to identify signs of a possible fracture:

- **Deformity** might not be obvious. Compare the injured part with the uninjured part on the other side.
- **Open wound** may indicate an underlying fracture.
- **Tenderness** and pain are commonly found only at the injury site. The victim can usually point to the site of the pain or feel pain when it is touched.
- **Swelling** caused by bleeding happens rapidly after a fracture.

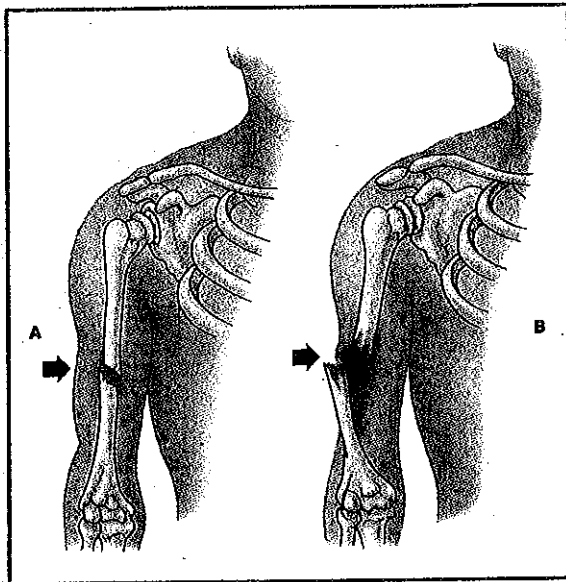


Figure 9-1

A. Closed fracture. B. Open fracture.

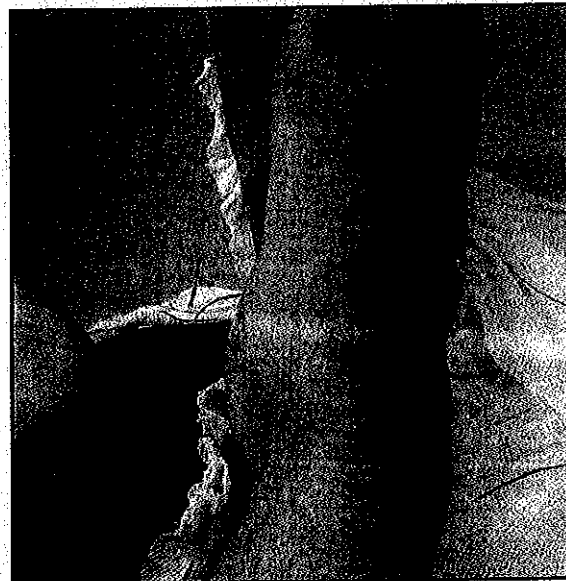


Figure 9-2

Closed ankle fracture.

Other indications of fracture can include:

- A grating or grinding sensation that can be felt and sometimes even heard when the ends of the broken bone rub together.
- The victim heard or felt the bone snap.



Figure 9-3

Open leg fracture.

Care for Bone Injuries

To care for a bone injury:

1. Allow the victim to support the injured area in the most comfortable position.
2. Stabilize the injured part to prevent movement.
 - If emergency medical services (EMS) will arrive soon, stabilize the injured part with your hands until they arrive.
 - If EMS will be delayed, or if you are taking the victim to medical care, stabilize the injured part with a **splint**.
3. If the injury is an open fracture, do not push on any protruding bone. Cover the wound and exposed bone with a dressing.
4. Apply an ice or cold pack if possible to help reduce the swelling and pain.
5. Call 9-1-1 for any open fractures or large bone fractures (such as the thigh) or when transporting the victim would be difficult or would aggravate the injury.

splint

A device used to stabilize an injured extremity.

► Splinting

A splint is a device that can be used to stabilize a bone or joint injury. Splinting an injured area helps reduce pain and prevent further damage to muscles, nerves, and blood vessels.

Types of Splints

A self-splint, or anatomic splint, is one in which the injured body part is tied to an uninjured part (for example, an injured finger to the adjacent finger, an injured arm to the chest, or the legs to each other) **Figure 9-4**.

A rigid splint is an inflexible device such as a padded board, a piece of heavy cardboard, or a commercially available moldable splint, such as a SAM splint, molded to fit the extremity. It must be long enough so that it can stabilize the area above and below the fracture site **Figure 9-5**.

A soft splint, such as a pillow or rolled blanket, is useful mainly for stabilizing fractures of the ankle and wrist **Figure 9-6**.

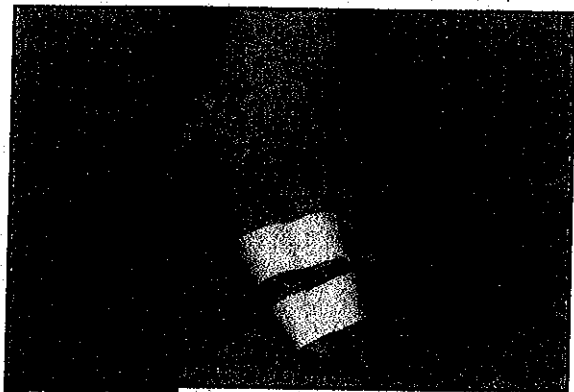


Figure 9-4

Anatomic splint.

Applying a Splint

To apply a splint, follow the steps shown in **Skill Drills 9-1, 9-2, and 9-3**.

► Joint Injuries

in
joint ligaments.

A **sprain** is a common injury to a joint in which the ligaments and other tissues are damaged by violent stretching or twisting. Attempts to move or use the joint increase the pain. Common locations for sprains include the ankles, wrists, and knees.

ocation
: ends at a joint are no
er in contact.

A **dislocation** is a serious and less common joint injury. It occurs when a joint comes apart and stays apart, with the bone ends no longer

in contact. The shoulders, elbows, fingers, hips, knees, and ankles are the joints most frequently dislocated.

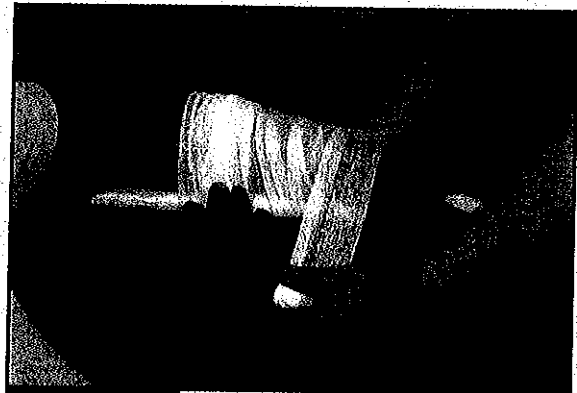


Figure 9-5

Rigid splint.

Recognizing Joint Injuries

The signs of a sprain or dislocation are similar to those of a fracture: pain, swelling, and inability to use the injured joint normally. The main sign of a dislocation is deformity. Its appearance will be different from that of an uninjured joint **Figures 9-7A, B**.

Care for Joint Injuries

To care for a joint injury:

1. If you suspect a dislocation, apply a splint if EMS will be delayed. Provide care as you would for a fracture. Do not try to put the displaced part back into its normal position

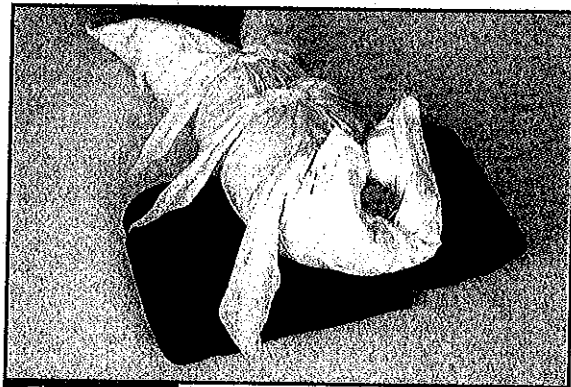


Figure 9-6

Soft splint.



Figure 9-7A

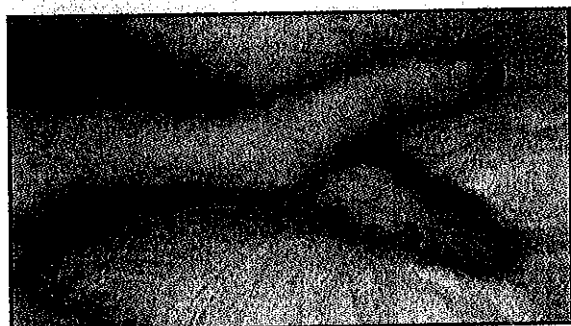


Figure 9-7B

A. Dislocated shoulder. B. Dislocated finger.

because nerve and blood vessel damage could result.

2. If you suspect a sprain, use the RICE procedure (see **Skill Drill 9-4**).
3. Seek medical care. Call 9-1-1 for any dislocations or injuries for which transporting the victim would be difficult or would aggravate the injury.

► RICE Procedure

RICE is the acronym for rest, ice, compression, and elevation. This mnemonic will help you remember the care for a joint injury (such as a sprain) or a muscle injury (for example, a strain or contusion).

To perform the RICE procedure, follow the steps in **Skill Drill 9-4**.

CAUTION

DO NOT apply an ice or cold pack for more than 30 minutes at a time.

DO NOT stop using an ice or cold pack too soon. A common mistake is the early use of heat, which increases circulation to the injured area, resulting in swelling and pain.

► Muscle Injuries

A muscle **strain**, also known as a muscle pull, occurs when a muscle is overstretched and tears. Back muscles are commonly strained when people lift heavy objects.

A muscle **contusion**, or bruise, results from a blow to the muscle. A muscle **cramp** occurs when a muscle goes into an uncontrolled spasm.

strain

Stretched or torn muscle.

contusion

A bruise; an injury that causes a hemorrhage in or beneath the skin but does not break the skin.

cramp

A painful spasm, usually of a muscle.

Recognizing Muscle Injuries

The signs of a muscle strain include the following:

- Sharp pain
- Tenderness when the area is touched
- Weakness and loss of function of the injured area
- Stiffness and pain when the victim moves the muscle

The signs of a muscle contusion include the following:

- Pain and tenderness
- Swelling
- Bruise appearing hours after the injury

The signs of a muscle cramp include the following:

- Spasm
- Pain
- Inability to use the injured area

Care for Muscle Injuries

Care for muscle strains and contusions includes resting the affected muscles and applying an ice or cold pack. To care for a muscle cramp, have the victim stretch the affected muscle or apply pressure directly to it.

Medical Emergencies

11

Meeting OSHA Recommendations

This chapter and the accompanying lesson cover the following OSHA Best Practices Guide: *Fundamentals of a Workplace First Aid Program* (2006)

4. Responding to Life-Threatening Emergencies

- Assessing and treating a victim who has an unexplained change in level of consciousness
- Responding to Medical Emergencies:
 - Chest pain
 - Breathing problems
 - Hypoglycemia in diabetics taking insulin
 - Seizures
 - Pregnancy complications
 - Reduced level of consciousness

► Changes in Consciousness

Victims can be conscious (responsive), or unconscious (unresponsive). Not all victims are fully alert, and some may only respond to different levels of stimulation. Some may respond to your voice, whereas others only respond to physical stimulation (for example, squeezing the hand or shoulder muscle). The level of consciousness indicates how well the brain is functioning.

What to Look For

The mnemonic STOP offers clues when you notice changes in consciousness and you are not sure what is causing it.

What to Do

1. Perform a primary and secondary check and provide care as needed.
2. If unresponsive and not breathing, perform CPR.
3. If unresponsive and vomiting, roll the victim onto his or her side.
4. Call 9-1-1.

Table 11-1 Changes in Consciousness

S = Sugar, Seizures, Stroke, Shock	Blood glucose (sugar) too low (for example, in an insulin reaction)
T = Temperature	Too high (heatstroke) or too low (hypothermia)
O = Oxygen	Inadequate oxygen
P = Poisoning or pressure on brain	Drug/alcohol overdose, carbon monoxide poisoning, head injury

► Chest Pain

Chest pain can signal a heart attack, but there are other causes and not all of them involve the heart.

Heart Attack

A heart attack occurs when the oxygen-rich blood supply to part of the heart is blocked. Pain comes from a lack of oxygen to the heart muscle. The chest pain can be crushing, vice-like, and squeezing and typically lasts more than 10 minutes. It may spread to the jaw or down the arms, usually the left.

To care for chest pain associated with a heart attack:

1. Call 9-1-1.
2. Have the victim rest.
3. If the victim has physician-prescribed nitroglycerin, help him or her take it (usually a small tablet or spray placed under the tongue).
4. If the victim is not allergic to aspirin, give four chewable aspirin tablets (81 mg each) or one regular aspirin tablet (325 mg).

Respiratory Infection

Pneumonia, bronchitis, or pleurisy can cause chest pain, as well as a cough, fever, sore throat, and production of saliva. Seek medical care for respiratory infections.

Muscle Pain

Physical activity and overexertion can result in chest pain. Rest and an over-the-counter pain medication are usually all that are needed to provide relief.

► Breathing Difficulty

Breathing difficulty can result from injuries to the chest or head and from illnesses such as heart attack, anaphylaxis, or asthma. **Asthma** is a condition in which air passages narrow and mucus builds up, resulting in poor oxygen exchange. It can be triggered by such things as an allergy, cold exposure, and smoke. **Hyperventilation** is fast breathing, which can be caused by emotional stress, anxiety, and medical conditions.

asthma

An acute spasm of the smaller air passages that causes difficult breathing and wheezing.

hyperventilation

Abnormally fast breathing.

Recognizing Breathing Difficulty

The signs of breathing difficulty include the following:

- Breathing that is abnormally fast or slow
- Breathing that is abnormally deep (gasping) or shallow
- Noisy breathing, including wheezing (seen with asthma) or gurgling, crowing, or snoring sounds
- Bluish lips
- Need to pause while speaking to catch breath

Care for Breathing Difficulty

To care for a victim with breathing difficulty:

1. Help the victim into the most comfortable position. This is often seated upright.
2. Call 9-1-1.
3. If the victim has a prescribed asthma inhaler, assist the victim in using it **ORALLY**.
4. If the victim is hyperventilating (breathing fast) due to anxiety, have him or her inhale through the nose, hold the breath for several seconds, then exhale slowly.

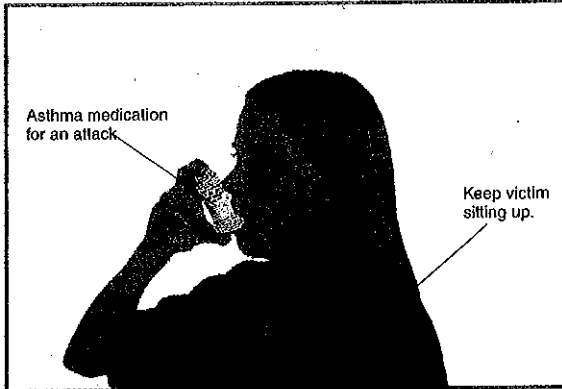


Figure 11-1

Taking asthma medication.

► Fainting

Fainting can happen suddenly when blood flow to the brain is interrupted. Causes include exhaustion, lack of food, reaction to pain or the sight of blood, hearing bad news, standing too long without moving, or problems with the heart.

Recognizing Fainting

The signs of fainting include the following:

- Sudden, brief unresponsiveness
- Pale skin
- Sweating

Care for Fainting

To care for fainting:

1. Check responsiveness and breathing and provide care as needed.
2. Loosen any restrictive clothing.
3. If the victim fell, check for injuries.
4. Most fainting episodes in younger patients are not serious, and the victim recovers quickly. Seek medical care if the victim:
 - Has repeated fainting episodes
 - Does not quickly become responsive
 - Becomes unresponsive while sitting or lying down
 - Faints for no apparent reason
 - Is elderly

► Seizures

A **seizure** results from an abnormal stimulation of the brain's cells. A variety of causes can lead to seizures, including the following:

- Epilepsy
- Heatstroke
- Poisoning
- Electric shock
- Hypoglycemia
- High fever
- Brain injury, tumor, or stroke
- Alcohol or other drug withdrawal or abuse

seizure

Sudden violent muscle rigidity and jerky movements (convulsions) resulting from abnormal stimulation of the brain's cells.

Recognizing a Seizure

The signs of a seizure will vary depending on the type of seizure and can include the following:

- Sudden falling
- Unresponsiveness
- Rigid body and arching of the back
- Jerky muscle movement

Care for a Seizure

To care for a victim having a seizure:

1. Prevent injury by moving away any dangerous objects.
2. Loosen any restrictive clothing.
3. Roll the victim onto his or her side to help keep the airway clear.
4. Call 9-1-1 for seizures occurring for no known reason.

► Diabetic Emergencies

Diabetes results when the body fails to produce sufficient amounts of insulin, which helps regulate blood glucose level.

diabetes

A disease in which the body is unable to use glucose normally because of a deficiency or total lack of insulin.

There are two types of diabetes:

- *Type 1:* People with type 1 diabetes require external (not made by the body) insulin to allow glucose to pass from the blood into cells.
- *Type 2:* People with type 2 diabetes may not be dependent on external insulin to allow glucose into cells and may take only oral medication to help control the disease.

The body is continuously balancing glucose and insulin. Too much insulin and not enough glucose leads to low blood glucose (hypoglycemia). Too much glucose and not enough insulin leads to high blood glucose (hyperglycemia) **Figure 11-2**.

Recognizing Low Blood Glucose

hypoglycemia

Abnormally low blood glucose level.

A very low blood glucose level, called **hypoglycemia**, can be caused by too much insulin, too little or delayed food intake, exercise, illness, or any combination of these factors.

In a person with diabetes, the signs of low blood glucose include the following:

- ⊗ Sudden onset of symptoms
- ⊗ Staggering, poor coordination
- ⊗ Anger, bad temper
- ⊗ Pale skin
- ⊗ Confusion, disorientation
- ⊗ Sudden hunger
- ⊗ Excessive sweating
- ⊗ Trembling
- ⊗ Seizure
- ⊗ Unresponsiveness

Care for Low Blood Glucose

To care for a diabetic with low blood glucose (hypoglycemia) who is responsive and can swallow:

1. Give sugar, such as one tablespoon, half a can of soda, juice, three glucose tablets, or one tube of glucose gel **Figure 11-3**.
2. If there is no improvement, call 9-1-1.

If the victim is unresponsive, do not give anything by mouth. Call 9-1-1.

Recognizing High Blood Glucose

hyperglycemia

Abnormally high blood glucose level.

Hyperglycemia is the opposite of hypoglycemia. Hyperglycemia occurs when the body has too much glucose in the blood but is

unable to get it to the cells. This condition may be caused by insufficient insulin, overeating, inactivity, illness, stress, or a combination of these factors.

In a person with diabetes, there may be no signs of high blood glucose initially. Signs of high blood glucose requiring medical attention may include:

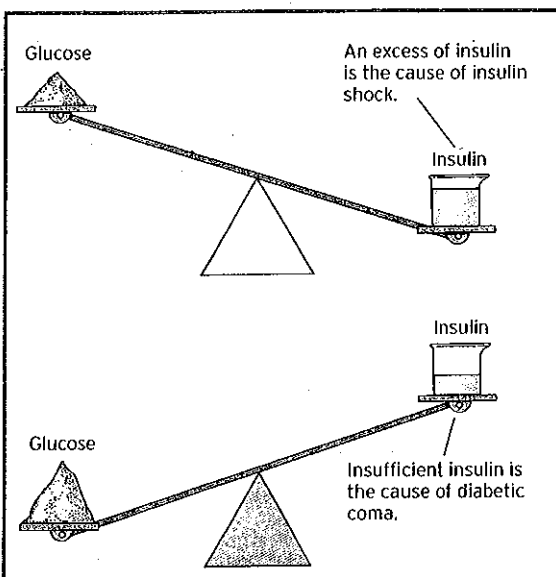


Figure 11-2

Diabetic emergencies.

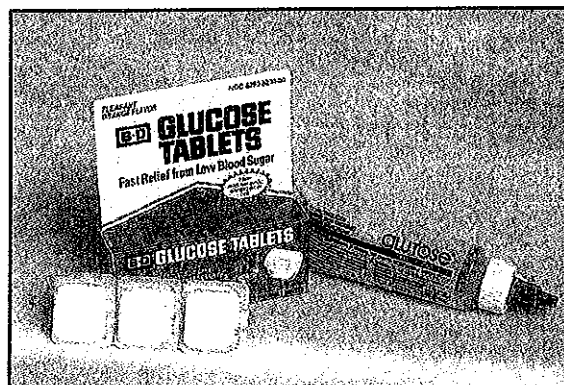


Figure 11-3

Glucose tablets and gel.

- ⊗ Gradual onset of symptoms
- ⊗ Drowsiness
- ⊗ Extreme thirst
- ⊗ Very frequent urination
- ⊗ Warm and dry skin
- ⊗ Vomiting
- ⊗ Fruity, sweet breath odor
- ⊗ Rapid breathing
- ⊗ Unresponsiveness

Care for High Blood Glucose

To care for a diabetic with high blood glucose (hyperglycemia):

1. If you are uncertain whether the victim has a high or low blood glucose level, provide care as you would for low blood glucose.
2. If the victim's condition does not improve in 15 minutes, seek medical care by calling 9-1-1.

► Emergencies During Pregnancy

Most pregnancies are normal and occur without complications. However, problems sometimes arise, and medical care is required. It is essential that you remain calm, focused, and considerate of the mother during this unforeseen and stressful situation.

Recognizing Emergencies During Pregnancy

The signs of emergencies during pregnancy may include the following:

- Vaginal bleeding
- Cramps in the lower abdomen
- Swelling of the hands, feet, or face
- Severe continuous headache
- Dizziness or fainting
- Blurring of vision or seeing spots
- Uncontrollable vomiting

Care for Pregnancy Emergencies

If the victim is experiencing vaginal bleeding or abdominal pain or injury:

1. Keep her warm and on her left side.
2. If vaginal bleeding is present, have the victim place a sanitary napkin or any sterile or clean pad over the opening of the vagina.
3. Save any blood-soaked pads and all tissues that are passed. Send this with the woman when she is transported for medical care.
4. Seek medical care.

Care for Ingested Poisons

To care for victims who have ingested poisons:

1. Determine the following:
 - The age and size of the victim
 - What was swallowed (read container label; save vomit for analysis)
 - How much was swallowed (for example, a dozen tablets)
 - When it was swallowed

poison control center

Medical facility providing immediate, free, expert advice anytime by calling 1-800-222-1222.

activated charcoal

Powdered charcoal that has been treated to increase its powers of absorption. Used to treat patients who have ingested poisons.

2. For a responsive victim, call the poison control center at 1-800-222-1222. Most poisonings can be treated by following the instructions received by telephone from a **poison control center**. The poison control center may advise you to dilute the poison, induce vomiting, or provide **activated charcoal** if available.

The poison control center staff will also advise you if a call to 9-1-1 or additional medical care are needed.

3. Call 9-1-1 for an unresponsive and breathing victim. Provide CPR if the victim is unresponsive and not breathing until EMS personnel arrive.

► Alcohol and Other Drug Emergencies

Poisoning caused by an overdose or abuse of medications and other substances, including alcohol, is common. The most commonly abused drug in the United States is alcohol.

Recognizing Alcohol Intoxication

Helping an intoxicated person can be difficult because the person may be belligerent or combative. The victim's condition may be quite serious, even life threatening. Although the following signs indicate alcohol intoxication, some can also mean injury or illness other than alcohol intoxication, such as diabetes:

- The odor of alcohol on a person's breath or clothing
- Unsteadiness, staggering
- Confusion
- Slurred speech
- Nausea and vomiting
- Flushed face

Activated Charcoal

Activated charcoal is a fine, black, odorless powder that is available as a liquid. Activated charcoal prevents the absorption of most poisons and drugs by the stomach and intestines (Figure 12-1).

Activated charcoal does not absorb all drugs well. Acids and alkalis (for example, bleach and ammonia), potassium, iron, alcohol, methanol, kerosene, gasoline, and cyanide require different treatment.

A drawback of activated charcoal is its grittiness and its appearance. Trying to improve the taste or consistency by adding chocolate syrup, sherbet, ice cream, or milk only decreases the charcoal's binding capacity.

CAUTION

DO NOT give water or milk to dilute poisons unless instructed to do so by a poison control center.

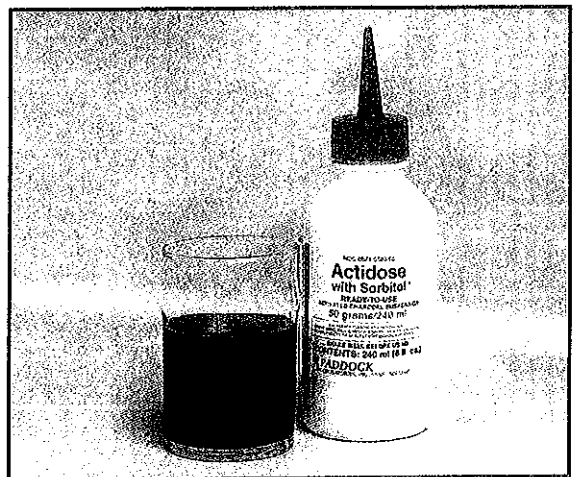


Figure 12-1

Activated charcoal.

Care for Alcohol Intoxication

To care for alcohol intoxication:

1. If the victim is responsive:
 - Check breathing.
 - Call the poison control center for advice (1-800-222-1222).
 - If the victim becomes violent, leave the area and call 9-1-1.

- If the victim is unresponsive and breathing, then roll the victim to his or her side (recovery position). Call 9-1-1. If the victim is unresponsive and not breathing, begin CPR.

CAUTION

DO NOT let an intoxicated person sleep on his or her back.

DO NOT leave an intoxicated person alone, unless he or she becomes violent.

DO NOT try to handle a hostile intoxicated person by yourself.

Recognizing Drug Overdose

The condition of a person suffering from a drug overdose may be quite serious, even life threatening. The signs of drug overdose include the following:

- Drowsiness, anxiety, agitation, or hyperactivity
- Change in pupil size
- Confusion
- Hallucinations

Care for Drug Overdose

Care for drug overdose is the same as that for alcohol intoxication.

► Inhaled Poisoning

carbon monoxide

A colorless, odorless, poisonous gas formed by incomplete combustion, such as in fire.

Poisoning victims can be unaware of a gas's presence. A gas such as **carbon monoxide** is invisible, tasteless, odorless, and nonirritating. It is produced by the incomplete burning

of organic material such as gasoline, wood, paper, charcoal, coal, and natural gas.

Recognizing Inhaled Poisoning

The signs of inhaled poisoning include the following:

- Headache
- Breathing difficulty
- Chest pain
- Nausea and vomiting

- Dizziness and visual changes (blurred or double vision)
- Unresponsiveness

Care for Inhaled Poisoning

To care for victims of inhaled poisons:

- Get the victim out of the toxic environment and into fresh air.
- Check responsiveness and breathing and provide care as needed.
- Call 9-1-1.
- Try to determine what substance was involved.

► Chemical Safety at the Worksite

To ensure chemical safety at the worksite, information must be available about the identities and hazards of the chemicals. OSHA's Hazard Communication Standard (HCS) requires the development and dissemination of such information:

- Chemical manufacturers and importers are required to evaluate the hazards of the chemicals they produce or import, and prepare labels and **Material Safety Data Sheets (MSDSs)** to convey the hazard information to their downstream customers.
- All employers with hazardous chemicals in their workplaces must have labels and MSDSs for their exposed workers and train them to handle the chemicals appropriately.

Material Safety Data Sheet (MSDS)

Lists the hazardous ingredients of products, as well as their characteristics, effects on human health, and treatment for exposure.

Material Safety Data Sheets

For each hazardous chemical in the workplace, an employer is required by law to maintain a copy of the MSDS. An MSDS lists the hazardous ingredients of a product, its physical and chemical characteristics, effects on human health, the chemicals with which it can react adversely, handling precautions, measures that can be used to control exposure and contain a spill, and emergency and first aid procedures.

► Plant Poisoning

More than 60 plants can cause allergic reactions, but poison ivy, poison oak, and poison sumac are by far the most common **Figure 12-2A-C**.

Recognizing Plant Poisoning

An allergic reaction usually occurs 24 to 72 hours after contact.

The signs of plant poisoning include the following:

- Rash **Figure 12-3**
- Itching
- Redness
- Blisters
- Swelling

Care for Plant Poisoning

To care for plant poisoning:

1. If available, put on medical exam gloves to avoid exposure to the plant oil. Wash the affected area with soap and water as soon as possible to remove oily resin.
2. For a mild reaction, have the victim do any of the following:
 - Soak in a lukewarm bath sprinkled with 1 to 2 cups of colloidal oatmeal (such as Aveeno)
 - Apply calamine lotion (calamine ointment if the skin becomes dry and cracked)
3. For a more severe reaction, care for the skin as you would for a mild reaction and seek medical care. A prescribed oral **corticosteroid** may be needed.

corticosteroid

Medication to lessen inflammation and relieve irritation.

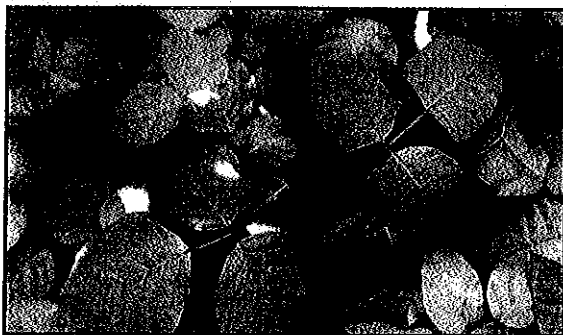


Figure 12-2A

Poisonous plants. A. Poison ivy.



Figure 12-2B



Figure 12-2C

Poisonous plants. B. Poison oak. C. Poison sumac.

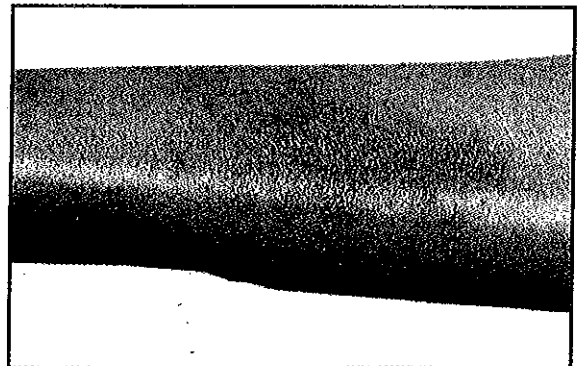


Figure 12-3

Poison ivy rash.

Bites and Stings

► Animal and Human Bites

An estimated one of every two Americans will be bitten by an animal or by another person. Dogs account for about 80% of all animal-bite injuries. **Figure 13-1**

The human mouth contains a wide range of bacteria, so there is a chance that a wound caused by a human bite may become infected.

Rabies

Rabies is caused by a virus found in warm-blooded animals that spreads from one animal to another in the saliva, usually through a bite or scraping of the teeth against the skin.

An animal should be considered possibly rabid if:

- The animal attacked without provocation.
- The animal acted strangely or out of character (for example, a usually friendly dog is aggressive or a wild fox seems docile and "friendly").
- The animal was a high-risk species (for example, 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 the victim was bitten by a healthy domestic dog or cat, the animal should be confined and observed for 10 days for any illness.

rabies

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

Meeting OSHA Recommendations

with chapter and the accompanying table cover the following OSHA Best Practices Guide: *Implementation of a Workplace First Aid Program* (2006)

5. Responding to Non-Life-Threatening Emergencies

Bites and Stings

- Anticipate animal bites
- Bites and stings from insects; insect bites in first-aid treatment of anaphylactic shock



Figure 13-1

Dog bite.

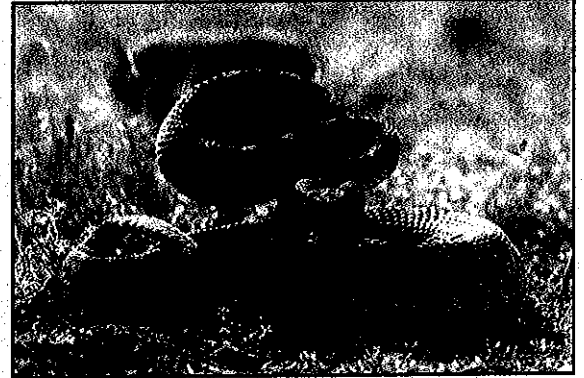


Figure 13-2

Rattlesnake.

If the victim was bitten by a wild animal, the incident should be considered a possible rabies exposure and medical care should be sought immediately. If a bat is found in a bedroom upon waking or in the room of an infant, child, person with disabilities, or an elderly person, then seek medical care immediately.

Care for an Animal or Human Bite

To care for an animal or human bite:

1. If the wound is not bleeding heavily, wash it with soap and water under pressure.
2. Flush the wound thoroughly with running water.
3. Control bleeding and cover the wound with a sterile or clean dressing.
4. Seek medical care for further wound cleaning and closure, and possible tetanus or rabies care.

► Snake Bites

Only four native snake species in the United States are venomous: rattlesnakes, copperheads, water moccasins (also known as cottonmouths), and coral snakes. Rattlesnakes (Figure 13-2), copperheads, and water moccasins are pit vipers. The coral snake is small and colorful, with a black snout and a series of bright red, yellow, and black bands around its body (every other band is yellow). Venomous snakes from other countries also pose a snake-bite problem.

Recognizing a Venomous Snake Bite

The signs of a pit viper bite include the following:

- Severe, burning pain
- Puncture wounds about ½ to 1 ½ inches apart (Figure 13-3)
- Swelling
- Discoloration and blood-filled blisters possibly developing hours after the bite (Figure 13-4)
- Nausea, vomiting, sweating, and weakness

Care for a Venomous Snake Bite

To care for a pit viper bite:

1. Get the victim and bystanders away from the snake.
2. Keep the victim calm and limit movement. Immobilize the affected limb.
3. Gently wash the bitten area with soap and water. Do not attempt to trap or kill the snake.
4. If the bite is from a coral snake, apply mild pressure (able to slip a finger under it) by wrapping an elastic bandage (for example, an ACE bandage) over the bite site and the entire length of an arm or leg.
5. Seek medical care immediately.

CAUTION

DO NOT cut the victim's skin, attempt to suck out the venom, or apply ice or cold to the bitten area.

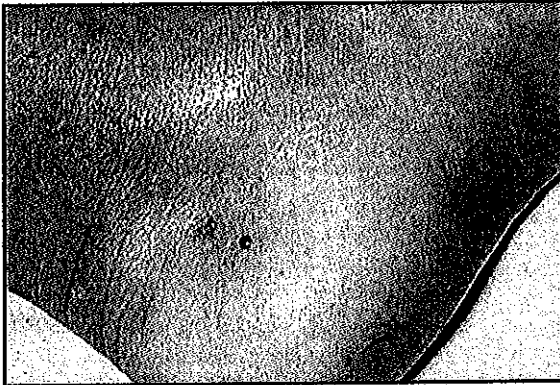


Figure 13-3

Rattlesnake bite (note the two fang marks).



Figure 13-4

Copperhead bite 2 hours after bite.



Antivenin

antivenin

An antiserum containing antibodies against reptile or insect venom.

Identifying the type of pit viper is not very important because the same **antivenin** is used to counteract all North American pit viper venom. However the antivenin for a coral snake is different.

► Insect Stings

anaphylaxis

A severe allergic reaction that can be life threatening.

Most people will only experience the mild effects of an insect sting. However, some people can have severe allergic reactions (**anaphylaxis**).

Recognizing an Insect Sting

A rule of thumb is that the sooner symptoms develop after a sting, the more serious the reaction will be. Common signs of an insect sting are as follows:

- Pain
- Itching
- Swelling

Signs of a severe allergic reaction (anaphylaxis) include:

- Difficulty breathing
- Tightness in the chest
- Swelling of the tongue, mouth, or throat
- Dizziness and nausea

Care for an Insect Sting

To care for an insect sting:

1. If the stinger is embedded, remove it as quickly as possible using any removal method (e.g., brush it away with your hand, scrape it with a fingernail, or scrape it with a hard object such as a credit card or driver's license). Do not use tweezers.
2. Wash the area with soap and water.
3. Apply ice or a cold pack over the area

Figure 13-5

4. Applying a hydrocortisone cream can help combat local swelling and itching. An antihistamine (such as Benadryl) reduces some itching if given early and should be taken as soon as possible. However when taken by mouth, an antihistamine may work too slowly to counteract a life-threatening allergic reaction.
5. Observe the victim for signs of a severe allergic reaction. For a person having a severe allergic reaction, call 9-1-1. If the victim has a prescribed auto-injector, help the victim use it.

► Spider Bites

Most spiders are venomous. However, most spiders lack an effective delivery system—long fangs and strong jaws—to bite a human. In North America, death occurs rarely and only from bites by black widow spiders. A spider bite is difficult to diagnose, especially when the spider was not seen or recovered, because the bites typically cause little immediate pain.



Figure 13-5

Yellow jacket.

Recognizing a Black Widow Spider Bite

Black widow spiders have round abdomens that vary from gray to brown to black, depending on the species. The female black widow often has a shiny black abdomen with a red or yellow spot, often in the shape of an hourglass **Figure 13-6**.

Signs of a black widow spider bite can include the following:

- The victim may feel a sharp pinprick when the spider bites, but some victims are not aware of the bite. Within 15 minutes, a dull, numbing pain develops in the bite area.
- Two small fang marks might be seen as tiny red spots.
- Severe abdominal pain develops (a bite on an arm can cause severe chest pain, mimicking a heart attack).
- Headache, chills, fever, heavy sweating, dizziness, nausea, and vomiting appear next.

Recognizing a Brown Recluse Spider Bite

Brown recluse spiders are also known in North America as fiddle-back and violin spiders. They have a violin-shaped figure on their backs (several other spider species have a similar configuration on their backs). Color varies from fawn to dark brown, with darker legs **Figure 13-7**.

Brown recluse spiders are found primarily in the southern and midwestern states, with other less toxic but related spiders found throughout the rest of the

country. They are absent from the Pacific Northwest, where the aggressive house spider, also known as the hobo spider, is found and causes injuries similar to those of the brown recluse.

Signs of a brown recluse and hobo spider bite include the following:

- A local reaction usually occurs within several hours, with mild to severe pain and itching.
- A blister often develops several days later, becomes red, and bursts. During the early stages, the affected area often takes on a bull's-eye appearance, with a central white area surrounded by a reddened area, ringed by a whitish or blue border **Figure 13-8**.
- A scab will form that falls off in a few days, leaving a large ulcer. This process of slow tissue destruction can continue for weeks or months. The ulcer sometimes requires skin grafting.
- Other signs can include headache, fever, weakness, nausea, and vomiting.

Recognizing a Tarantula Spider Bite

Tarantulas bite only when provoked or roughly handled. The bite varies from almost painless to a deep throbbing pain that lasts up to 1 hour.

Care for All Spider Bites

To care for any spider bite:

1. If possible, catch the spider to confirm its identity.
2. Wash the bitten area with soap and water.
3. Apply ice or a cold pack over the bite to relieve pain.
4. Seek medical care. For black widow spider bites, an antivenin exists that can provide relief within a few hours. Small children and frail elderly people are most at risk for severe complications or death.

► Scorpion Stings

Scorpions look like miniature lobsters, with lobster-like pincers and a long upcurved "tail" with a poisonous stinger **Figure 13-9**. Several species of scorpions inhabit the southwestern United States, but only the bark scorpion of Arizona is potentially deadly. Small children and frail elderly people are most at risk for severe complications or death.

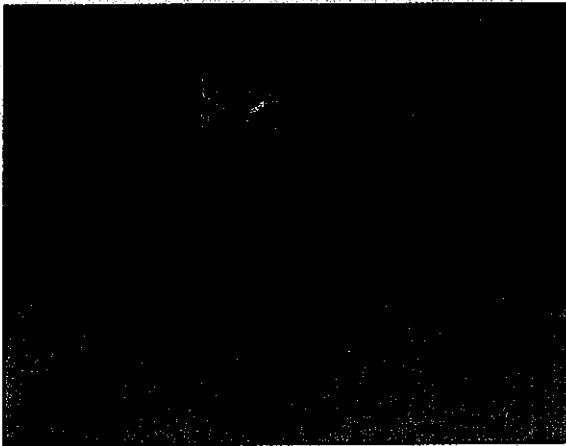


Figure 13-6

Black widow spider. Note red hourglass configuration on abdomen.

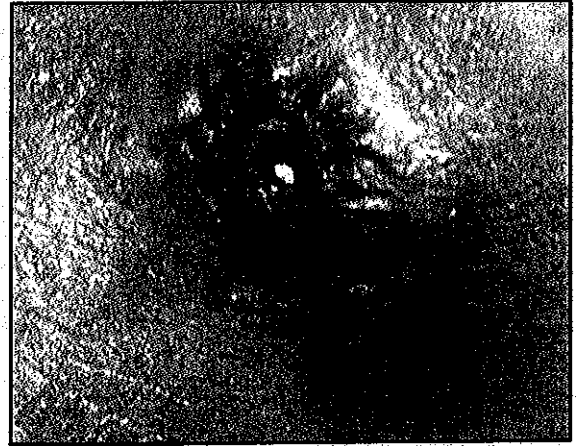


Figure 13-8

Brown recluse spider bite. Note bull's-eye appearance.

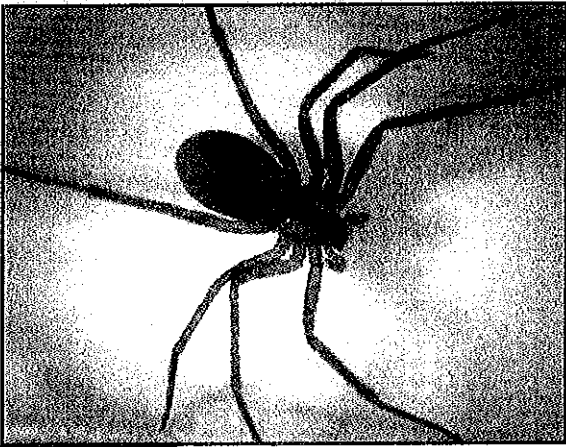


Figure 13-7

Brown recluse spider.

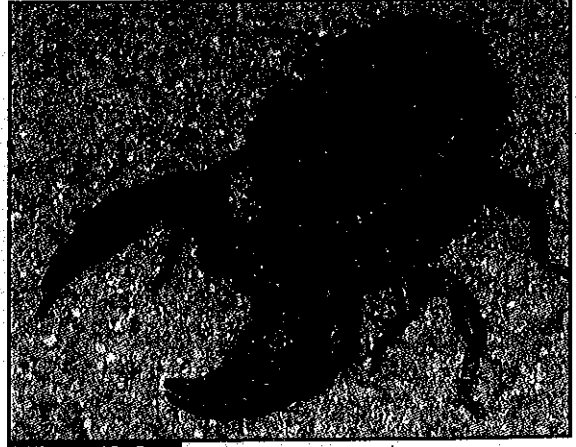


Figure 13-9

Scorpion.

Recognizing a Scorpion Sting

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

Care for a Scorpion Sting

To care for a scorpion sting:

1. Gently wash the sting site with soap and water or rubbing alcohol.
2. Apply ice or a cold pack over the area.
3. Seek medical care.

► Tick Bites

Most tick bites are harmless, although ticks can carry serious diseases (Figure 13-10). If a tick is carrying a disease, the longer it stays embedded, the greater the chance of disease being transmitted. Because its bite is painless, a tick can remain embedded for days without the victim realizing it.

Two types of ticks can transmit diseases. Deer ticks are small, about the size of the head of a pin. Wood ticks are larger, usually about one quarter of an inch. Depending on where the victim lives, doctors may prescribe preventative treatment for certain



Figure 13-10

Deer tick.

diseases. If a tick is found embedded in a victim, especially if it may have been there for more than a few hours, the victim should seek medical care.

Care for Tick Bites

1. Remove the tick with tweezers or a specialized tick-removal tool. Grasp the tick as close to the skin as possible and lift the tick with enough force to "tent" the skin surface. Hold it in this position until the tick lets go.
2. Wash the area with soap and water or use an antiseptic.
3. Apply ice or a cold pack to reduce pain.
4. Seek medical care if the tick was attached for more than a few hours. If a rash appears, seek medical care. Watch for other signs of disease transmitted by ticks, such as fever, muscle or joint aches, and weakness, and seek medical care if signs develop.

► Marine Animal Injuries

Most marine animals bite or sting in defense, rather than attacking. Injuries can include wounds and allergic reactions.

Marine Animals That Bite, Rip, or Puncture

Shark bites are rare and wounds are similar to injuries caused by boat propellers and chain saws.

Barracudas have an undeserved reputation as attackers of humans. The risk of a barracuda bite is exceedingly small.

Moray eels are known to bite divers who handle or tease them, usually in competition for food or in pursuit of lobsters.

Care for Bites, Rips, or Punctures from Marine Animals

To care for a bite, rip, or puncture caused by a marine animal:

1. Control bleeding.
2. Care for shock.
3. Call 9-1-1.

Marine Animals That Sting

Each year, jellyfish and Portuguese man-of-wars sting more than 1 million people. Reactions to being stung vary from mild dermatitis to severe reactions. Most victims recover without medical care.

Jellyfish and Portuguese man-of-war stings usually result in welts with redness, burning pain, and muscle cramping. This reaction is due to venom injected by special cells called nematocysts.

Care for Stings from Marine Animals

To care for stings from marine animals:

1. Carefully pick off any tentacles remaining on the skin. Use gloves if available.
2. Apply vinegar to jellyfish stings to neutralize nematocysts.
3. Immerse the affected part in hot water as soon as possible.
4. Seek medical care.

CAUTION

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

Marine Animals That Puncture by Spines

Stingrays, commonly found in tropical and subtropical waters, are peaceful, reclusive bottom feeders that generally lie buried in the sand or mud. Most wounds inflicted by stingrays are produced on the ankle or foot when the victim steps on a ray. The sting is usually more like a laceration because the large tail barb can do significant damage. The venom causes intense burning pain at the site.

Care for Punctures from Marine Animal Spines

To care for punctures from marine animal spines:

1. Relieve pain by immersing the injured body part in hot water for 30 to 90 minutes (hot water helps to neutralize the venom).
2. Wash the wound with soap and water.
3. Flush the area with water under pressure to wash out as much of the toxin and foreign material as possible.
4. Seek medical care.

Heat and Cold Emergencies

14

Meeting OSHA Recommendations

This document provides recommendations for employers to cover the following OSHA 3000 Program Center Training Manual (2000) Workplan for Safety Professionals (2000)

6. Response to Heat-Related Emergencies

Employers should:

- Provide shade and rest areas.
- Encourage workers to drink fluids.
- Provide first aid for heat-related emergencies, heat exhaustion, and heatstroke.

► Heat Emergencies

Prolonged exposure to high temperatures or physical activity in a hot environment can cause these heat-related illnesses: heat cramps, heat exhaustion, and heatstroke.

Recognizing Heat Cramps

heat cramps

Painful muscle spasms, often in the legs.

Heat cramps are painful muscle spasms that occur suddenly, often after physical exertion. They usually involve the muscles in the back of the leg (calf and hamstring muscles) but may also involve the abdomen.

Care for Heat Cramps

To care for heat cramps:

1. Have the victim stop activity and rest in a cool area.
2. Stretch and massage the cramped muscle.
3. If the victim is responsive and not nauseated, provide water or a commercial sports drink (such as Gatorade® or Powerade®).

Recognizing Heat Exhaustion

heat exhaustion

Condition caused by the loss of the body's water and salt through excessive sweating.

Heat exhaustion is caused by the loss of water and salt through heavy sweating. Heat exhaustion affects those who do not drink enough fluid while working

or exercising in hot environments and those not acclimated to hot, humid conditions.

The signs of heat exhaustion can include the following:

- Heavy sweating
- Severe thirst
- Weakness
- Headache
- Nausea and vomiting

Care for Heat Exhaustion

To care for heat exhaustion:

1. Have the victim stop activity and rest in a cool area.
2. Remove any excess or tight clothing.
3. If the victim is responsive and not nauseated, provide water or a commercial sports drink.
4. Have the victim lie down.
5. Apply cool packs to the armpits and to the crease where the legs attach to the pelvis.
6. Seek medical care if the condition does not improve within 30 minutes. Children or frail adults should be seen by a medical professional.

CAUTION

DO NOT place the victim in an ice bath.
DO NOT cool the victim so much that the victim begins to shiver.

Recognizing Heatstroke

heatstroke

Condition in which the body's heat-regulating ability becomes overwhelmed and ceases to function properly, resulting in an inability to sweat and a dangerously high body temperature.

Heatstroke is a life-threatening condition in which the body becomes dangerously overheated. Heatstroke can occur quickly (for example, to a long-distance runner during a very hot day) or it can take days to develop (for example, to an elderly person without air conditioning during a heat wave).

The signs of heatstroke can include the following:

- Extremely hot skin
- Dry skin (may be wet from strenuous work or exercise)
- Confusion
- Seizures
- Unresponsiveness

Care for Heatstroke

To care for heatstroke:

1. Call 9-1-1.
2. Cool the victim immediately by whatever means possible: cool, wet towels or sheets to the head and body accompanied by fanning, and/or cold packs against the armpits, sides of neck, and groin.
3. If unresponsive and not breathing, start CPR.

► Cold Emergencies

When exposed to very cold environments, the body may become overwhelmed. Cold exposure may cause injury to parts of the body (frostbite) or to the body as a whole (hypothermia).

Frostbite

Frostbite happens only when temperatures drop below freezing. It affects mainly the feet, hands, ears, and nose (Figures 14-1A, B). When skin tissue dies (gangrene) from frostbite, an affected part may have to be amputated.

frostbite

Tissue damage caused by extreme cold.



Figure 14-1A



Figure 14-1B

A. Frostbitten fingers. B. Frostbitten toes.

The signs of frostbite include the following:

- White, waxy-looking skin
- Skin feels cold and numb (pain at first, followed by numbness)
- Blisters, which may appear after rewarming

Care for Frostbite

To care for frostbite:

1. Move the victim to a warm place.
2. Remove wet/cold clothing and jewelry from the injured part.
3. Seek medical care.

CAUTION

DO NOT rub or massage the frostbitten area.

Caring for Frostbite in a Remote Location

If the victim is in a remote location (more than 1 hour from medical care) and you have warm water, use the following rewarming method:

1. Place the frostbitten part in warm (100°F) water for 20 to 40 minutes or until the tissue becomes soft. For ear or facial injuries, apply warm, moist cloths and change them frequently.
2. After thawing:
 - Place dry dressings between fingers or toes.
 - Slightly elevate the affected part to reduce pain and swelling.
 - Provide ibuprofen or acetaminophen for pain and swelling.

hypothermia

A dangerous condition caused by severe exposure to cold in which the core body temperature drops below 95°F.

Recognizing Hypothermia

Hypothermia develops when the body's temperature drops to about 95° F.

Hypothermia can develop either quickly (for example, cold water immersion) or gradually during prolonged exposure to a cold environment. The temperature does not have to be below freezing for hypothermia to occur.

The signs of hypothermia include the following:

- Uncontrollable shivering
- Confusion, sluggishness
- Cold skin even under clothing

Care for Hypothermia

To care for hypothermia:

1. Get the victim out of the cold.
2. Prevent heat loss by:
 - Replacing wet clothing with dry clothing
 - Covering the victim's head
 - Placing insulation (such as blankets, towels, coats) beneath and over the victim
3. Have the victim rest in a comfortable position.
4. If the victim is alert and able to swallow, give him or her warm, sugary beverages.
5. Seek medical care for severe hypothermia (rigid muscles, cold skin on abdomen, confusion, lethargy).

An Ounce of Prevention

Prepare appropriately for any environment.

For a hot environment:

- Wear lightweight, loose-fitting clothes and a hat with a wide brim.
- Drink adequate water or commercial sports drinks.
- Take breaks in cooler areas.

For a cold environment:

- Layer clothing, with moisture-wicking clothing near the skin and outer layers that are windproof and waterproof but breathable material.
- Keep head and neck covered to minimize heat loss.
- Drink warm drinks and eat properly.