

Figure 1-1

Nature of injury of nonfatal occupational injuries involving days away from work, 2008.

Source: U.S. Department of Labor.



Figure 1-2

Sample first aid kit contents.

► First Aid Supplies

The supplies in a first aid kit should be customized to include those items likely to be used on a regular basis (Figure 1-2). A kit for the home is often different from one for the workplace. A home kit may contain personal medications and a smaller number of items. A workplace kit will need more items (such as bandages) and will not include personal medications. Table 1-1 lists the basic items that should be stocked in a first aid kit.

Although a first aid kit may have some medications, such as antihistamines and topical ointments, there may be local requirements that restrict the use of these items by first aiders without prior written approval. For example, teachers, activity leaders, and bus drivers in certain areas may not be able to administer these items to children without specific written permission signed by a child's parent or guardian.

The following is a list of medications for specific emergencies that a first aider might assist a victim in taking:

Over-the-counter (nonprescription) medications:

- Aspirin for adults experiencing chest discomfort believed to be associated with heart attack; children and those who are sensitive or allergic should never be given aspirin
- Oral glucose for diabetic emergency
- Antihistamines may help to treat minor allergic reactions

Physician-prescribed medications (the victim must have his or her own prescription to these medications):

- Prescribed inhalers for asthma
- Prescribed nitroglycerin for chest pain
- Epinephrine auto-injector for anaphylaxis (severe allergic reactions)

CAUTION

Note the expiration date on every medication.
Replace expired medications.
Keep all medications out of the reach of children.
Read and follow all directions for properly using medications.

► First Aid and the Law

Fear of lawsuits has made some people hesitant in becoming involved in emergency situations. First aiders, however, are rarely sued. Following are the legal principles that govern first aid.

Good Samaritan Laws

In most emergencies, you are not legally required to give first aid. To encourage people to assist others needing help, **Good Samaritan laws**

Good Samaritan laws

Laws that encourage individuals to voluntarily help an injured or suddenly ill person by minimizing the liability for errors made while rendering emergency care in good faith.

Table 1-1 Sample Workplace First Aid Kit

Equipment	Minimum Quantity
Adhesive strip bandages (1" × 3")*	20
Triangular bandages* (muslin, 36–40" × 36–40" × 52–56")	4
Sterile eye pads (2½" × 2½")	2
Sterile gauze pads (4" × 4")	6
Sterile gauze pads (3" × 3")*	6
Sterile gauze pads (2" × 2")*	6
Sterile nonstick pads (3" × 4")*	6
Sterile trauma pads (5" × 9")*	2
Sterile trauma pads (8" × 10")	1
Sterile conforming roller gauze (2" width)	3 rolls
Sterile conforming roller gauze (4.5" width)	3 rolls
Waterproof tape (1" × 5 yd)	1 roll
Porous adhesive tape (2" × 5 yd)*	1 roll
Elastic roller bandages (4" and 6")	1 each
Antiseptic skin wipes, individually wrapped*	10
Antibiotic ointment, individual packets*	6
Disposable (medical exam) gloves (various sizes)*	2 pairs per size
Mouth-to-barrier device (either a face mask with a one-way valve or a disposable face shield)	1
Disposable instant cold packs	2
Sealable plastic bags (quart size)	2
Padded malleable splint (4" × 36")	1
Emergency blanket	1
Scissors	1
Tweezers	1
Hand sanitizer (61% ethyl alcohol)	1 bottle
Biohazard waste bag (3.5-gallon capacity)	2
List of local emergency telephone numbers	1
Mini flashlight and batteries	1
List of local emergency telephone numbers	1
First aid guide*	1

Note: Items with an * sign are required to meet the ANSI/ISEA Z308.1 (2009) minimum standard for a workplace first aid kit. Additional items may be added based on potential hazards.

provide protection against lawsuits. Although laws vary from state to state, Good Samaritan protection generally applies only when the rescuer is:

- Acting during an emergency
- Acting in good faith, which means he or she has good intentions
- Acting without compensation
- Not guilty of malicious misconduct or gross negligence toward the victim (intentionally deviating from established medical guidelines)

Good Samaritan laws are not a substitute for competent first aid or for staying within the scope of your training. To find out about your state's Good Samaritan laws, ask for information at your local library or ask an attorney.

Duty to Act

A **duty to act** requires an individual to provide first aid. No one is required to give first aid when no legal duty exists. Duty to act may apply in the following situations:

duty to act

An individual's legal responsibility to provide victim care.

- *When employment requires it.* If your employer designates you as responsible for providing first aid to meet Occupational Safety and Health Administration (OSHA) requirements and you are called to an emergency, you are required to provide first aid. Examples of occupations that involve a duty to act include law enforcement officers, park rangers, athletic trainers, lifeguards, and teachers
- *When a preexisting responsibility exists.* You may have a preexisting relationship with other persons that makes you responsible for them, which means you must give first aid if they need it. For example, a parent has a preexisting responsibility for a child, and a driver for a passenger.

Figure 1-3

Consent

A first aider must have the **consent** (permission) of a responsive (alert) person before providing care. The victim may give this permission verbally or with a nod of the head (**expressed consent**). Tell the victim your name, that you have first aid training, and what you would like to do to help.

consent

Permission from a victim to allow the first aider to provide care.

expressed consent

Consent explicitly given by a victim that permits the first aider to provide care.



Figure 1-3

Occupations that involve a duty to act include lifeguarding.

When the victim is unresponsive (motionless), an adult who is mentally incompetent, or a child with a life-threatening condition whose parent or legal guardian is not available, first aiders should assume that **implied consent** is given. This assumes that the victim (or parent/guardian) would want care provided.

Implied consent

Consent assumed because the victim is unresponsive, mentally incompetent, or underage and has no parent or guardian present.

Abandonment

Abandonment

Failure to continue first aid until relieved by someone with the same or higher level of training.

Once you have started first aid, do not leave the victim until another trained person takes over. Leaving the victim without help is known as **abandonment**.

Negligence

Negligence

Deviation from the accepted standard of care resulting in further injury to the victim.

Negligence occurs when a victim suffers further injury or harm because the care that was given did not meet the standards expected

from a person with similar training in a similar situation. Negligence involves the following:

- Having a duty to act, but either not doing so or doing so incorrectly
- Causing injury and damages
- Exceeding your level of training

► Prevention Practices

Prevention practices can reduce deaths, injuries, and sudden illnesses. These practices involve three areas of intervention:

- Education
- Enforcement
- Engineering

“An ounce of prevention is worth a pound of cure” is a statement meant to show that it is easier to prevent an injury or illness than it is to treat either one. Prevention requires a combination of interventions that include:

1. Educational or persuasive appeals designed to motivate people to change behaviors that put them at risk.
2. Enforced laws and regulations that require changes in behavior.
3. Engineering changes in products and environment that provide automatic protection from injury.

Table 1-2 Examples of Interventions

Education/Persuasion

- Swimming lessons
- Gun safety course
- DVD showing safety procedures or messages
- Weather and road condition alerts for drivers

Enforcement/Laws

- Seat belt and helmet requirement laws
- Drunk driving laws
- Prohibiting fireworks
- Personal flotation devices (PFDs) use when boating
- Building codes and inspections

Engineering/Technology

- Air bags in cars
- Helmets
- Child-resistant packaging on medications and chemicals
- Smoke and carbon dioxide detectors



Action at an Emergency

2

► Recognizing Emergencies

The bystander is a vital link between medical care and the victim. It is often a bystander who first recognizes a situation as an emergency and acts to help the victim. To help in an emergency, the bystander first has to notice that something is wrong; usually, a person's appearance or behavior or the surroundings suggest that something unusual has happened.

► Deciding to Act

At some point, everyone will have to decide whether to help another person. You will be more likely to get involved if you have previously considered the possibility of helping others. The most important time to make the decision to help is before you ever encounter an emergency.

Perform a Scene Size-Up

If you are at the scene of an emergency, take a few seconds to briefly survey the scene, considering three things:

1. *Hazards that could be dangerous to you, the victim(s), or bystanders.* Before approaching the victim(s), scan the area for immediate dangers (such as oncoming traffic, electrical wires, or an assailant). Always ask yourself: Is the scene safe?

Meeting OSHA Recommendations

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

2. Preparing to Respond to a Health Emergency

- Interacting with the local EMS system.
- Understanding the effects of stress, fear, or distraction, particularly how they interfere with performance, and what to do to overcome these barriers to action.
- Learning the importance of universal precautions and body substance isolation to provide protection from bloodborne pathogens and other potentially infectious materials, including about personal protective equipment.

(Continues on next page)

Meeting OSHA Recommendations

Assessing the Scene and the Victim(s)

- Assessing the scene for safety, number of injured, and nature of the event.
- Emphasizing early activation of EMS.

Responding to Non-Life-Threatening Emergencies

- Wounds
- Principles of body substance isolation, universal precautions, and use of personal protective equipment.

2. *Impression of what happened.* Is it an injury or illness, and is it severe or minor?
3. *How many people are involved.* There may be more than one victim, so look around and ask about others who might have been involved.

► Seeking Medical Care

To know when to seek medical care, you must know the difference between a minor injury or illness and a life-threatening one. For example, upper abdominal pain could be indigestion, ulcers, or an early sign of a heart attack. Wheezing may be related to a person's asthma, for which the person can use his or her prescribed inhaler for quick relief, or it can be a severe, life-threatening allergic reaction to a bee sting.

Not every cut needs stitches, nor does every burn require medical care. However, it is always best to err on the side of caution: When a serious situation occurs, call 9-1-1 *first*. Do not call your doctor, the hospital, or a friend, relative, or neighbor for help before you call 9-1-1. Calling anyone else first only wastes time.

TABLE 2-1 provides guidance on when to call 9-1-1.

Laypersons sometimes make wrong decisions about calling 9-1-1. They may delay calling 9-1-1 or even bypass emergency medical services (EMS) and transport the seriously ill or injured victim to medical care in a private vehicle when an ambulance would have been a better choice for the victim.

Table 2-1 When to Call 9-1-1

If the answer to any of the following questions is yes, or if you are unsure, call 9-1-1 or your local emergency number for help.

- Is the victim's condition life threatening?
- Could the condition get worse and become life threatening on the way to the hospital?
- Does the victim need the skills or equipment of emergency medical technicians or paramedics?
- Would distance or traffic conditions cause a delay in getting to the hospital?
- Could moving the victim cause further injury?
- Do you suspect a spinal injury?

The following are specific serious conditions for which 9-1-1 should be called:

- Fainting or loss of consciousness
- Chest or abdominal pain or pressure
- Sudden dizziness, weakness, or change in vision
- Difficulty breathing or shortness of breath
- Severe or persistent vomiting
- Sudden, severe pain anywhere in the body
- Suicidal or homicidal feelings
- Bleeding that does not stop after 10 to 15 minutes of pressure
- A gaping wound with edges that do not come together
- Problems with movement or sensation following an injury
- Hallucinations and clouding of thoughts
- A stiff neck in association with a fever or a headache
- A bulging or abnormally depressed fontanelle (soft spot) in infants
- Stupor or dazed behavior accompanying a high fever
- Unequal pupil size, loss of consciousness, blindness, staggering, or repeated vomiting after a head injury
- Spinal injuries
- Severe burns
- Poisoning
- Drug overdose

Source: American College of Emergency Physicians.

Calling 9-1-1

To receive emergency assistance in most communities, you simply dial 9-1-1. Check to see if this is true in your community. Emergency telephone numbers are usually listed on the inside front cover of telephone directories. Keep these numbers nearby or on every telephone. Dial "0" (the operator) if you do not know the emergency number. When you call 9-1-1, the dispatcher will request certain information:

1. Your name and number.
2. The victim's location.
3. What happened.
4. Number of persons needing help and any special conditions.
5. Victim's condition.

Do *not* hang up the phone until the dispatcher instructs you to do so. The EMS dispatcher may also tell you what to do until EMS arrives. If you send someone else to call, have the person report back to you so you can be sure the call was made.

► Disease Transmission

The risk of acquiring an infectious disease while providing first aid is very low. But it can be even lower if you know how to protect yourself against diseases transmitted by blood and air.

Bloodborne Diseases

bloodborne diseases

Infections transmitted through the blood, such as HIV or hepatitis B virus.

- Hepatitis B virus
- Hepatitis C virus
- Human immunodeficiency virus

hepatitis

A viral infection of the liver.

Some diseases are carried by an infected person's blood (bloodborne diseases). Contact with infected blood may result in infection by one of several viruses, such as the following:

Hepatitis is a viral infection of the liver. Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections result in long-term liver con-

ditions and can lead to liver cancer. Each is caused by a different virus. A vaccine is available for HBV but not for HCV. Employers are required to provide free vaccinations for employees who may be at risk for HBV (for example, health care providers).

A person infected with human immunodeficiency virus (HIV) can infect others through blood or body fluids. Unless treated, those infected with HIV almost always develop acquired immunodeficiency syndrome (AIDS), which is a major cause of death worldwide. No vaccine is available to prevent HIV infection. The best defense against AIDS is to avoid becoming infected.

human immunodeficiency virus (HIV)

The virus that causes acquired immunodeficiency syndrome (AIDS).

Airborne Diseases

Diseases transmitted through the air by coughing or sneezing (airborne diseases) include tuberculosis (TB). TB has increased in frequency and is receiving much attention. TB, which is caused by a bacteria, usually settles in the lungs and can be fatal. In most cases, a first aider will not know that a victim has TB.

Assume that any person with a cough, especially one who is in a nursing home or a shelter, may have TB. Other symptoms include fatigue, weight loss, chest pain, and coughing up blood. If a surgical mask is available, wear it or wrap a handkerchief over your nose and mouth. Advise the victim to cover his or her mouth when coughing. The victim can be given a surgical mask, if available, if the victim is able to tolerate wearing it.

airborne diseases

Infections transmitted through the air, such as tuberculosis.

tuberculosis (TB)

A bacterial disease that usually affects the lungs.

Protection

In most cases, you can control the risk of exposure to diseases by wearing personal protective equipment (PPE) and by following some simple procedures. PPE blocks entry of organisms into the body. The most common type of protection involves wearing disposable medical exam gloves **Figure 2-1**. All first aid kits should have several pairs of gloves. Because some rescuers and victims have allergic reactions to latex, latex-free gloves (vinyl or nitrile) should be available.

personal protective equipment (PPE)

Equipment, such as disposable medical exam gloves, used to block the entry of an organism into the body.

Protective eyewear and breathing devices may also be necessary in some emergencies.

Follow standard practices that assume that all blood and body fluids are infected. Protect yourself even if blood or body fluids are not visible. At the



Figure 2-1

Barrier devices, such as medical gloves, are recommended when providing first aid.

workplace, PPE must be accessible, and your employer must provide training to help you choose the right PPE for your work.

First aiders can protect themselves and others against diseases by following these steps:

1. Wear appropriate PPE, such as gloves. If gloves are not available, put your hands in plastic bags for protection.
2. If you have been trained in the correct procedures, use absorbent barriers to soak up blood or other infectious materials.
3. Clean the spill area with an appropriate disinfecting solution, such as diluted bleach (one fourth cup of bleach in a gallon of water).
4. Discard contaminated materials in an appropriate waste disposal container.
5. Wash your hands with soap and water after giving first aid.

6. If the exposure happened at work, report the incident to your supervisor. Otherwise, contact your personal physician or seek emergency care.

Handwashing

Handwashing is an effective way to prevent disease transmission. When washing hands with soap and water:

1. Wet your hands with clean running water and apply soap.
2. Rub hands together to make a lather. Scrub all surfaces for at least 20 seconds.
3. Rinse hands under running water.
4. Dry your hands with a clean towel.

If soap and clean water are not available, use an alcohol-based hand sanitizer to clean your hands.

► Rescuer Reactions

After providing care for severe injuries or illnesses, rescuers may feel an emotional letdown. Stressful events can be psychologically overwhelming and may result in a condition known as **posttraumatic stress disorder**. Its symptoms include depression and flashbacks. Discussing your feelings, fears, and reactions within 24 to 72 hours of helping at a traumatic injury scene helps prevent later emotional problems. You could discuss your feelings with a trusted friend, a mental health professional, or a member of the clergy. Quickly bringing out your feelings helps relieve personal anxieties and stress.

posttraumatic stress disorder

A psychological disorder that may occur after a stressful event; symptoms include depression and flashbacks.

Finding Out What's Wrong

3

► Perform a Scene Size-Up

As you approach an emergency scene, do a quick **scene size-up** to determine safety, the general type of problem (for example, whether it is an injury or illness and whether it is severe or minor), and the number of victims. If there are two or more victims, go to the quiet, motionless victim(s) first. If the scene is unsafe (i.e., downed power lines, fire, or smoke), it may be necessary to simply call 9-1-1 and wait for emergency personnel to make the scene safe. It is critical that you do not rush into an unsafe scene and become a victim.

When you reach the victim, check to see what is wrong. Identify and correct any immediate life-threatening conditions first.

If there are no immediate threats to life, do a quick physical check and gather information (history) about the problem.

► Primary Check

The **primary check** determines whether there are life-threatening problems requiring quick care. It will take only seconds to complete the primary check, unless you find that immediate care is required at any point during the primary check. This step involves checking for the following:

scene size-up

Quick survey of an emergency scene prior to providing care.

primary check

The first step in dealing with an emergency situation; this step determines whether there are life-threatening problems requiring quick care.

Meeting OSHA Recommendations

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

3. Assessing the Scene and the Victim(s)

- Assessing the scene for safety, number of victims, and nature of the event;
- Assessing each victim for responsiveness, airway patency (blockage), breathing/circulation, and medical alert tags;
- Taking a victim's history at the scene, including determining the mechanism of injury;
- Performing a logical head-to-toe check for injuries;
- Stressing the need to continuously monitor the victim;
- Emphasizing early activation of EMS.

- Responsiveness
- Breathing
- Severe bleeding

The primary check consists of two steps:

1. Determine if the victim is responsive and breathing **Figure 3-1**.
2. Check for any obvious severe bleeding **Figure 3-2**.

Responsiveness and Breathing

If the victim is alert and talking, then breathing and a heartbeat are present. Ask the victim his or her name and what happened. If the victim responds, then the victim is alert.

If the victim lies motionless, you must determine if the victim is responsive and breathing. Gently tap or shake the victim's shoulder and ask, "Are you okay?" to determine if he or she is responsive. If there is no response, the victim is considered unresponsive.

While checking responsiveness, also check quickly to see if the victim is having any obvious difficulty breathing by looking at the victim's chest and face. **Figure 3-1** provides examples of abnormal breathing sounds that you might hear.

Have someone call 9-1-1 for unresponsive victims and those not breathing or having difficulty breathing. Provide CPR for any unresponsive, non-breathing victim.

Severe Bleeding

Check for severe bleeding by quickly scanning for blood up and down the body, for blood-soaked clothing, or for blood collecting on the ground or floor. If you see severe bleeding, control it with pressure.

Positioning the Victim

Properly positioning the victim is an important step in providing first aid. For an unresponsive victim lying face down, roll the victim onto his or her back so that CPR can be started if necessary. If the victim is vomiting, has heavy secretions, or if you must leave an unresponsive victim to call 9-1-1, roll the victim onto his or her side (recovery position) **Figure 3-3**. This position allows the vomit or secretions to drain from the mouth and keep the airway clear. This position is acceptable even if the victim has a possible back or neck injury. If you have additional rescuers, have them

assist in rolling the victim while supporting the head and turning the head with the body.

▶ Secondary Check

With the primary check complete, and no life-threatening conditions present, perform a quick secondary check. The **secondary check** involves a quick physical check for any abnormalities, and gathering information that might be helpful in your immediate care, or for EMS providers if called.

secondary check

Process of checking the body and gathering information about the victim's condition.



Figure 3-1

Tap, shout, and check for breathing.

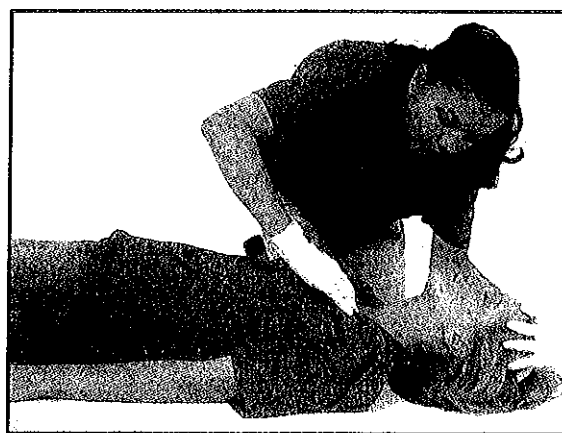


Figure 3-2

Quickly check for any obvious severe bleeding.

Table 3-1 Abnormal Breathing Sounds

Abnormal Sound	Possible Causes
Snoring	Airway partially blocked (usually by tongue)
Gurgling (breaths passing through liquid)	Fluids in throat
Noisy (squeaky or coarse)	Airway partially blocked
Wheezing	Spasm or partial obstruction in air passages in lungs (asthma, emphysema)
Occasional, gasping breaths (known as agonal gasps)	Temporary breathing after the heart has stopped



Figure 3-3

The recovery position.

Look for these items during the quick physical check:

- ◉ Signs—Conditions of the victim that you can see, feel, hear, or smell, such as seeing a dislocated shoulder
- ◉ Symptoms—Things the victim feels and is able to describe, such as chest pain

Most victims do not need a complete physical check, but only an exam of a specific area of the body.

For victims with injuries, look and feel for abnormalities. These include deformities, open wounds, tenderness, and swelling. The mnemonic **DOTS** is helpful for remembering these key signs of a problem.

DOTS

The mnemonic for remembering key signs of a problem: deformities, open wounds, tenderness, and swelling.

- ◉ **D** = Deformities: These occur when bones are broken, causing an abnormal shape **Figure 3-4**
- ◉ **O** = Open wounds: These cause a break in the skin and often bleeding **Figure 3-5**
- ◉ **T** = Tenderness: Sensitivity, discomfort, or pain when touched **Figure 3-6**
- ◉ **S** = Swelling: The body's response to injury. Fluids accumulate, so the area looks larger than usual **Figure 3-7**

Because most victims you encounter will be responsive and able to tell you what is wrong, you can focus your physical exam on the affected area of the body (for example, an injured ankle, painful stomach, or blurry vision).

With victims who have multiple injuries (for example, from a fall from a height or a motorcycle crash), you may have to check the victim's entire body to determine the extent of the injuries. In this case, start at the head and proceed down the body looking for signs of problems. Do not move the victim. To conduct a physical exam for an injury:

1. **Head:** Check for DOTS. Compare the pupils—they should be the same size and react to light. Check the ears and nose for clear or blood-tinged fluid. Check the mouth for objects that could block the airway, such as broken teeth **Figure 3-8**.
2. **Neck:** Check for DOTS. Look for a medical identification necklace **Figure 3-9**.
3. **Chest:** Check for DOTS. Gently squeeze **Figure 3-10**.
4. **Abdomen:** Check for DOTS. Gently push to see if there is tenderness **Figure 3-11**.
5. **Pelvis:** Check for DOTS. Gently push inward on the sides of the hips **Figure 3-12**. If there is any movement, stop pushing.
6. **Extremities:** Check both arms and legs for DOTS **Figure 3-13**.
7. **Back:** If no spinal injury is suspected, turn the victim on his or her side and check for DOTS.

While checking the head, check the color, temperature, and moisture of the skin, which can provide valuable information about the victim.



Figure 3-4

D = Deformity.

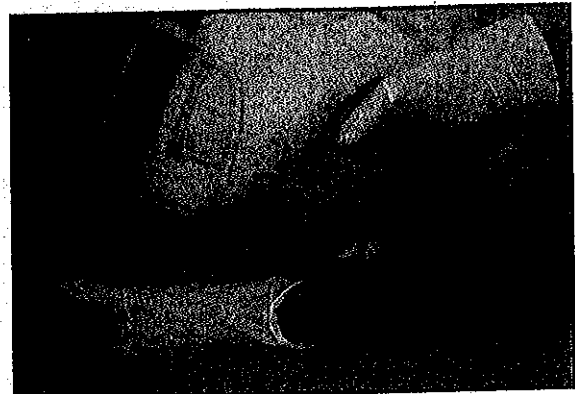


Figure 3-6

T = Tenderness.



Figure 3-5

O = Open wounds.



Figure 3-7

S = Swelling.

Table 3-2 Skin Color, Temperature, and Moisture

Skin Color	Possible Cause	Skin Temperature/Moisture	Possible Cause
Pink	Normal color inside lower eyelids, inside lips, and fingernail beds of all races	Warm and dry	Normal
Red (flushed)	Dilated blood vessels from emotional excitement, exposed to heat, high blood pressure, carbon monoxide poisoning	Hot and moist or dry	Excessive body heat (exposed to heat, high fever, heatstroke)
White (pale)	Constricted blood vessels from blood loss, shock, emotional distress	Cool and moist	Poor circulation, shock, blood loss
Blue (cyanotic)	Lack of oxygen in the blood and tissues from breathing or heart problems	Cold and moist or dry	Exposed to cold and losing heat (hypothermia, frostbite)
Yellow (jaundice)	Liver disease or failure		



Figure 3-8

Head: Check for DOTS. Compare the pupils. Check the ears and nose for clear or blood-tinged fluid. Check the mouth for objects that could block the airway.

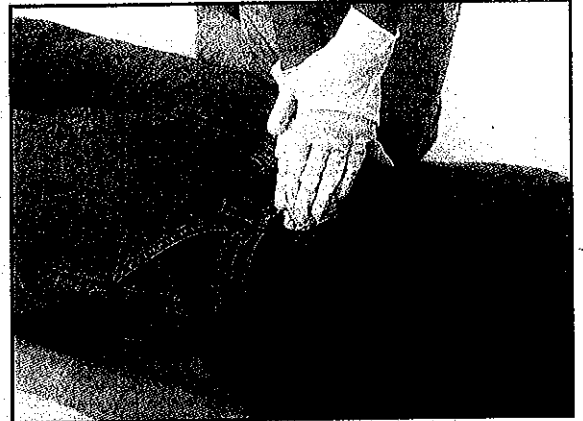


Figure 3-11

Abdomen: Check for DOTS. Gently push.



Figure 3-9

Neck: Check for DOTS. Look for a medical identification necklace.



Figure 3-12

Pelvis: Check for DOTS. Gently press inward on the hips.



Figure 3-10

Chest: Check for DOTS. Gently squeeze.



Figure 3-13

Extremities: Check both arms and legs for DOTS.

provides more information on skin color and temperature/moisture.

Low levels of oxygen in the blood result in the skin and mucous membranes becoming blue or gray (known as **cyanosis**). This change is usually obvious in the lips and skin of light-skinned persons. In darkly pigmented persons, it can be seen in the mouth's mucous membranes, nail beds, and inner lining of the eyelids.

cyanosis

Low levels of oxygen in the blood that result in the skin and mucous membranes becoming blue or gray.

CAUTION

When doing a physical exam:
DO NOT aggravate injuries.
DO NOT move a victim with a possible spinal injury.

Medical Identification Tags

medical identification tag

A bracelet or necklace that notes the wearer's medical problem(s).

The most common type of **medical identification tag** is jewelry (such as a bracelet or neck chain), which provides an inscription indicating an important medical condition that might require immediate medical care (Figure 3-14). The tag may have a telephone number that can be called for more information. Its intention is to alert medical personnel of the condition even if the wearer is not responsive or old enough to explain.

► Gathering Information

SAMPLE

The mnemonic for remembering key information about a patient's history: symptoms, allergies, medications, past medical history, last oral intake, and events leading up to the injury or illness.

An alert victim may provide information that indicates what is wrong and can indicate the need for first aid. The mnemonic **SAMPLE** helps you remember what information to gather (Figure 3-15). If the victim is unresponsive, you may be able to obtain a history from family, friends, or bystanders. As with the physical exam, gathering this information is secondary if you are dealing with a life-threatening condition.

► What to Do Until EMS Arrives

The primary and secondary checks are done quickly so that injuries and illnesses can be identified and appropriate first aid provided. If possible, record information found during this process and provide this information to arriving EMS personnel. Recheck the victim's condition every few minutes until EMS personnel arrive. Record any changes in the victim's condition.



Figure 3-14

Medical identification tag.

Table 3-3 SAMPLE History

Description	Questions
S = Signs/symptoms	"What's wrong?"
A = Allergies	"Are you allergic to anything?"
M = Medications	"Are you taking any medications? What are they for?"
P = Past medical history	"Have you had this problem before? Do you have other medical problems?"
L = Last oral intake	"When did you last eat or drink anything?"
E = Events leading up to injury	Injury: "How did you get hurt?" Illness: "What were you doing before the illness started?"

Bleeding and Wounds

► External Bleeding

External bleeding refers to when blood can be seen coming from an open wound. The term **hemorrhage** refers to a large amount of bleeding in a short time.

hemorrhage

A large amount of bleeding in a short time.

Recognizing External Bleeding

Injuries damage blood vessels and cause bleeding. The three types of bleeding relate to the type of blood vessel that is damaged: capillary, vein, or artery **Figure 4-1**.

- **Capillary bleeding** oozes slowly from a wound. It is the most common type of bleeding and easiest to control.
- **Venous bleeding** flows steadily. Because it is under less pressure, it does not spurt and is easier to control than arterial bleeding. However, it can be voluminous.
- **Arterial bleeding** spurts with each heartbeat. The pressure that causes the blood to spurt also makes this type of bleeding difficult to control. This is the most serious type of bleeding because a large amount of blood can be lost in a very short time.

capillary bleeding

Bleeding that oozes from a wound steadily but slowly.

venous bleeding

Bleeding from a vein; this type of bleeding tends to flow steadily.

arterial bleeding

Bleeding from an artery; this type of bleeding tends to spurt with each heartbeat.

Meeting OSHA Recommendations

This chapter and the accompanying lessons cover the following OSHA Best Practices Guide Fundamentals of a Workplace First Aid Program (2008):

4. Responding to Life-Threatening Emergencies

- Controlling bleeding with direct pressure

5. Responding to Non-Life-Threatening Emergencies

Wounds

- Assessment and first aid for wounds, including abrasions, cuts, lacerations, punctures, avulsions, amputations and crush injuries.

Principles of Wound Care, including infection prevention

- Musculoskeletal Injuries: Appropriate handling of amputated body parts

There are several types of open wounds

Figure 4-2A-F:

- *Abrasion:* The top layer of skin is removed, with little blood loss. Other names for an abrasion are *scrape*, *road rash*, and *rug burn*.
- *Laceration:* Cut skin with jagged edges. This type of wound is usually caused by a forceful tearing away of skin tissue.
- *Incision:* A cut with smooth edges, such as a knife or paper cut.
- *Puncture:* Injury from a sharp, pointed object (such as a knife or bullet). The penetrating object can damage internal organs. The risk of infection is high. The object causing the injury may remain embedded (impaled) in the wound.

- *Avulsion:* A piece of skin and/or tissue torn loose and hanging from the body.
- *Amputation:* The cutting or tearing off of a body part.

Care for External Bleeding

Care for serious external bleeding involves controlling the bleeding and protecting the wound from further injury **(SKIN DRILL 4-1)**.

A minor (shallow) wound should be cleaned to help prevent infection. Wound cleaning usually restarts bleeding by disturbing the clot, but it should be done anyway. For severe bleeding, leave the pressure bandage in place until the victim can get medical care. To care for a shallow wound:

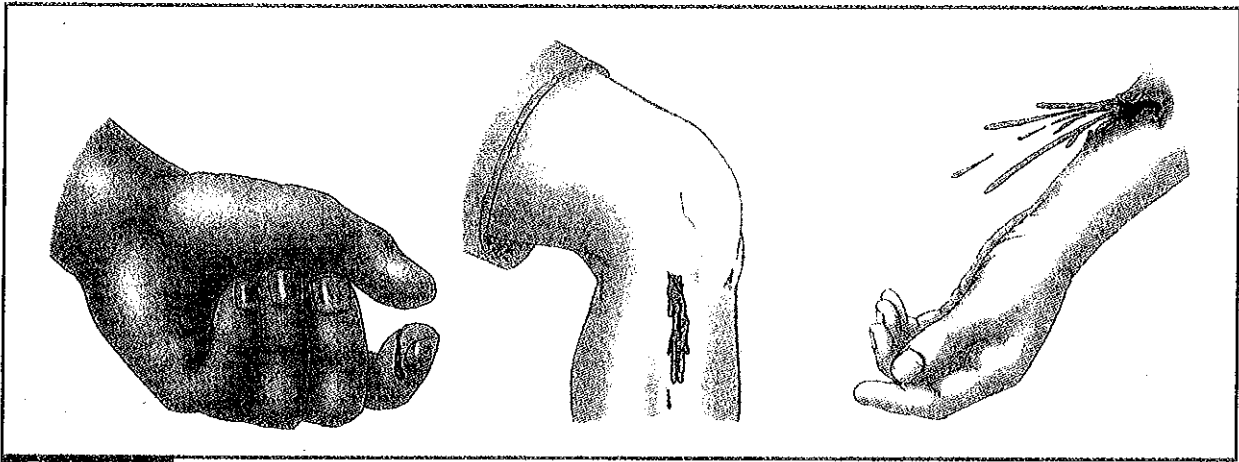


Figure 4-1

Capillary, venous, and arterial bleeding.

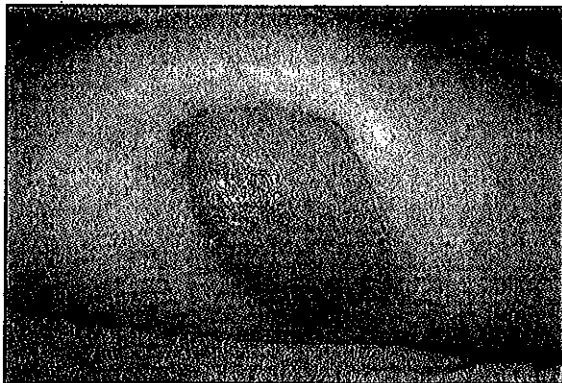


Figure 4-2A

Abrasion.



Figure 4-2B

Laceration.

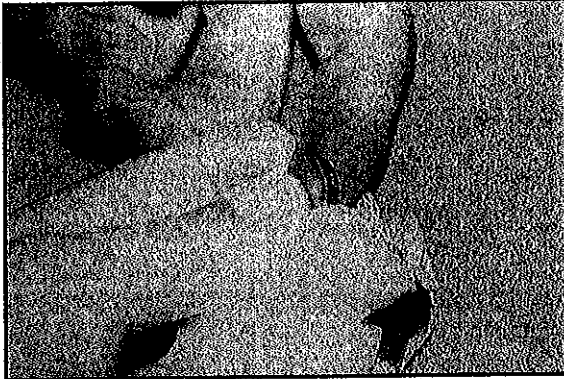


Figure 4-2C

Incision.

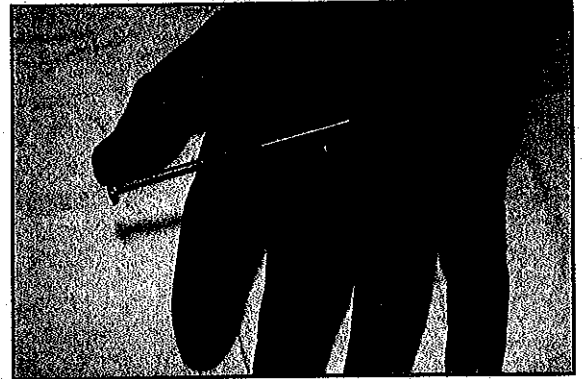


Figure 4-2D

Puncture.

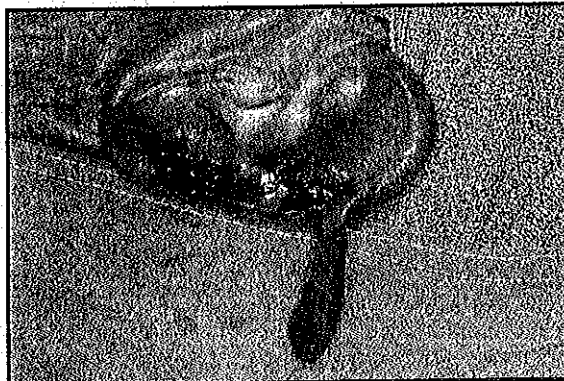


Figure 4-2E

Avulsion.

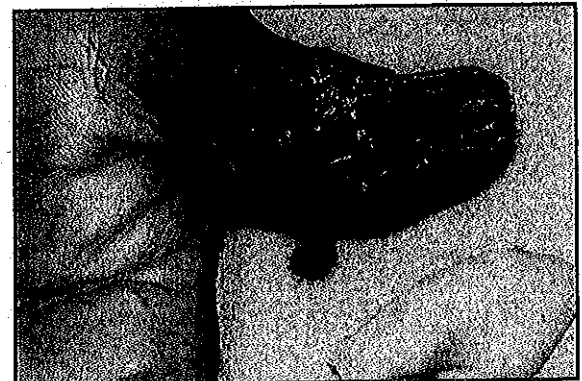


Figure 4-2F

Amputation.

1. If available, put on medical gloves.
2. Wash the wound with soap and water.
3. Flush the wound with running water under pressure.
4. Apply an antibiotic ointment.
5. Cover the area with a sterile and, if possible, nonstick dressing. Change the dressing and bandage periodically.
6. Seek medical care for a wound with a high risk for infection (such as an animal bite or a puncture).

CAUTION

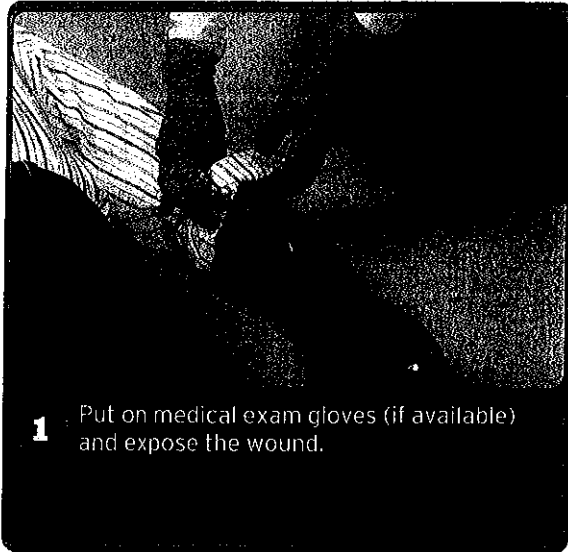
Once the wound has been cared for, wash your hands with soap and water, even if you used medical exam gloves.

DO NOT use direct pressure on an eye injury, a wound with an embedded object, or a skull fracture.

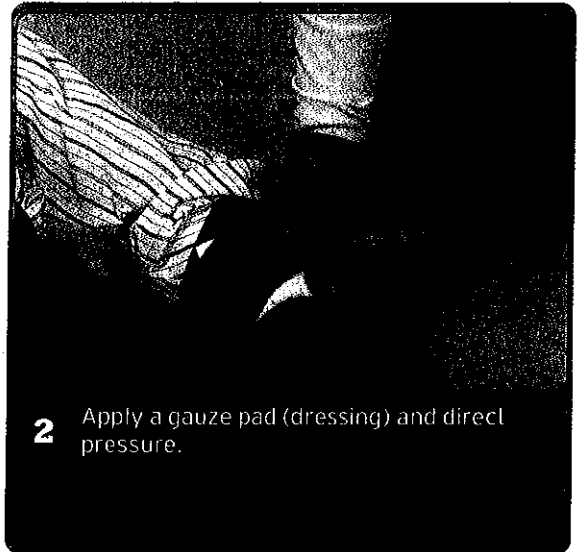
CAUTION

DO NOT pull a scab loose to change the dressing. If a sticking dressing must be removed, soak it in warm water to help soften the scab and make removal easier.

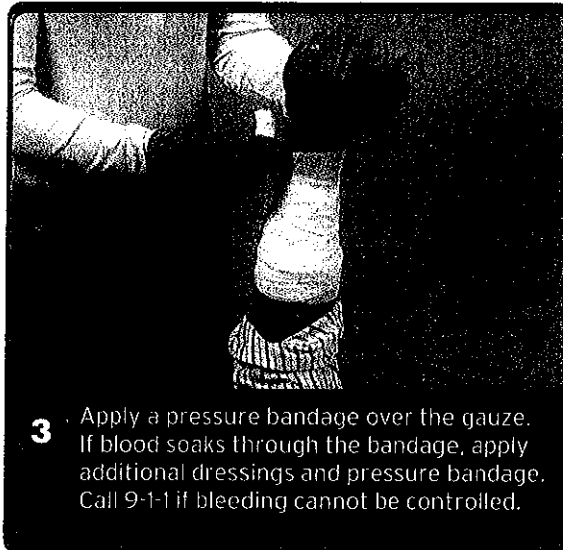
skill drill

4-1**Care for Serious External Bleeding**

1 Put on medical exam gloves (if available) and expose the wound.



2 Apply a gauze pad (dressing) and direct pressure.



3 Apply a pressure bandage over the gauze. If blood soaks through the bandage, apply additional dressings and pressure bandage. Call 9-1-1 if bleeding cannot be controlled.

► Wound Infection

Any wound, large or small, can become infected **Figure 4-3**. Seek medical care for infected wounds.

The signs that a wound may be infected include the following:

- Swelling and redness around the wound
- A sensation of warmth
- Throbbing pain
- Pus discharge
- Fever
- Swelling of lymph nodes
- Red streaks leading from the wound toward the heart



Tetanus

Tetanus is caused by a bacterium that can produce a powerful toxin when it enters a wound. The toxin causes contractions of certain muscle groups, particularly in the jaw. There is no known cure for the toxin.

Because of this danger, everyone needs an initial series of vaccinations to defend against the toxin. A booster shot every 10 years is sufficient to maintain immunity, although anyone with an animal bite should get a booster shot right away. Dirty wounds require a booster shot if the immunization was given more than 5 years ago. Tetanus immunization shots must be given within 72 hours of the injury to be effective.

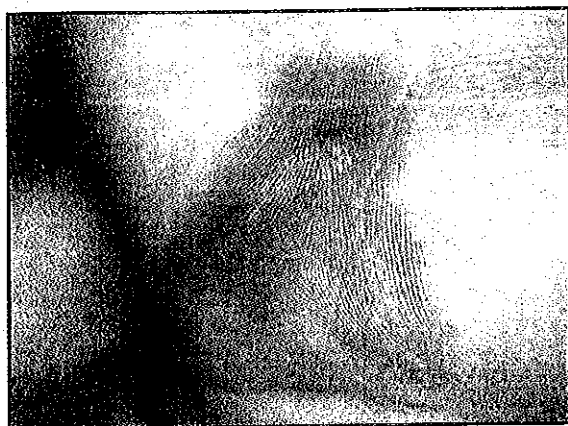


Figure 4-3

Infected wound.

► Amputations

The loss of a body part is a devastating injury that requires immediate medical care. To care for an amputation **Figure 4-4**:

1. Call 9-1-1.
2. Control bleeding.
3. Care for shock (see Chapter 5, *Shock*).
4. Recover the amputated part and wrap it in dry sterile gauze or a clean cloth.
5. Seal the wrapped amputated part in a plastic bag or other waterproof container.
6. Keep the part cool (for example, ice and water in a bowl), but do not freeze.



Cooling Amputated Parts

Amputated body parts that remain uncooled for more than 6 hours have little chance of survival; 18 hours is probably the maximum time allowable for a part that has been cooled properly. Muscles without blood lose viability within 4 to 6 hours.

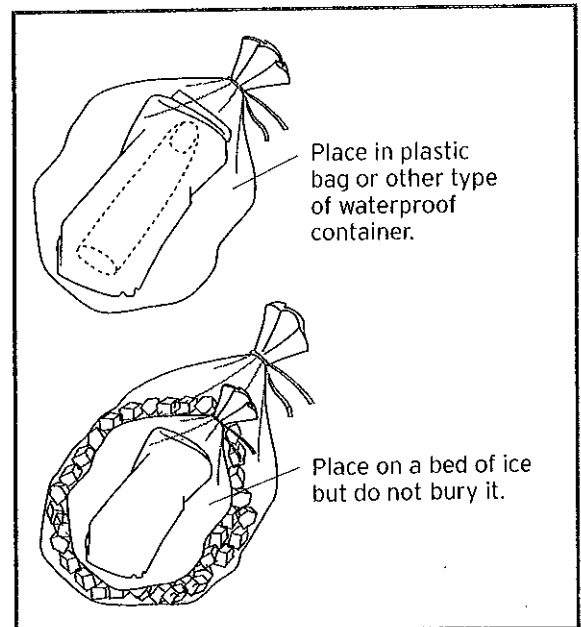


Figure 4-4

Care of amputated part.

► Impaled Objects

Objects such as glass, knives, and nails can be impaled (embedded) in the body (Figure 4-5). To care for these wounds:

1. Leave the object in place.
2. Expose the area. Remove or cut away clothing surrounding the injury.
3. Stabilize the object with bulky dressings or clean cloths around the object.
4. Seek medical care.

► Wounds That Require Medical Care

There are some guidelines that can help you identify which wounds need emergency medical care.

- Wounds that will not stop bleeding after 5 minutes of applying direct pressure.
- Long or deep cuts that need sutures (stitches).
- Cuts over a joint.
- Cuts that may impair function of a body area such as an eyelid or lip.
- Cuts that remove all of the layers of the skin, such as those from slicing off the tip of a finger.
- Cuts from an animal or human bite.
- Cuts that have damaged underlying nerves, tendons, or joints.
- Cuts over a possible broken bone.
- Cuts caused by a crushing injury.
- Cuts with an object embedded in them.
- Cuts caused by a metal or glass object or a puncture wound.

Call 9-1-1 immediately if:

- Bleeding is not controlled with the application of pressure after 10–15 minutes.
- Signs of shock occur, such as dizziness and pale, cool skin.
- Breathing is difficult because of a cut to the neck or chest.
- A deep cut to the abdomen causes moderate to severe pain.
- The eyeball has been cut.
- A cut amputates or partially amputates an extremity.



Figure 4-5

Impaled object in the chest.

► Internal Bleeding

A closed wound results when a blunt object does not break the skin, but tissue and blood vessels beneath the skin's surface are crushed, causing internal bleeding. In some cases it is easy to detect closed wounds from the bruising that often occurs. In other cases, a closed wound can be difficult to detect but can still be life threatening.

Recognizing Internal Bleeding

The signs of internal bleeding may appear quickly or take days to appear:

- Bruising
- Painful, tender area
- Vomiting or coughing up blood
- Stool that is black or contains bright red blood

Care for Internal Bleeding

For minor internal bleeding (such as a bruise on the leg from bumping into the corner of a table), follow these steps:

1. Apply ice or cold pack on the injured area for 20 minutes.
2. Compress the injured area by applying an elastic bandage for 2–3 hours.
3. Elevate an injured arm or leg, if it is not broken.
4. Repeat these steps.

To care for serious internal bleeding, follow these steps:

1. Call 9-1-1.
2. Care for shock by placing the victim on his or her back and covering the victim to maintain warmth.
3. If vomiting occurs, roll the victim onto his or her side to keep the airway clear.
4. Monitor breathing.

CAUTION

DO NOT give a victim anything to eat or drink. It could cause nausea and vomiting, which could result in aspiration (breathing in foreign material into the lungs). Food or liquids could cause complications if surgery is needed.

► Dressings and Bandages

dressing

A sterile gauze pad or clean cloth covering placed over an open wound.

to help absorb blood, prevent infection, and protect the wound from further injury. Dressings come in different shapes, sizes, and types. Dressings can be gauze pads (for example, 2" or 4" square or larger) used to cover larger wounds, or adhesive strips such as Band-Aids, which are dressings combined with a bandage for small cuts or scrapes (Figure 4-6).

bandage

Used to cover a dressing to keep it in place on the wound and to apply pressure to help control bleeding.

shapes, sizes, and material (Figure 4-7). Elastic bandages can be used to provide support and stability for an extremity or joint and to reduce swelling.

First aid kits include dressings and bandages to be used when controlling bleeding and caring for wounds. A **dressing** is a covering that is placed directly over a wound

A **bandage**, such as a roll of gauze, is often used to cover a dressing to keep it in place on the wound and to apply pressure to help control the bleeding. Like dressings, bandages also come in different

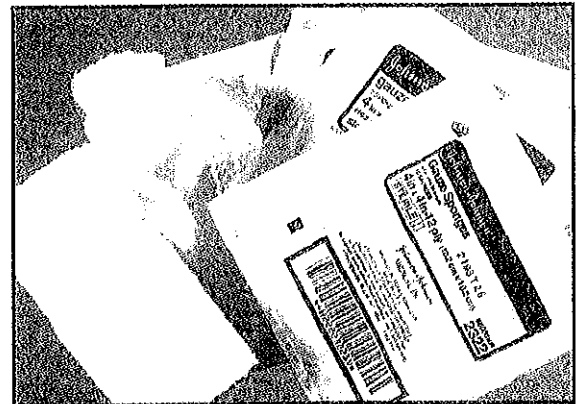


Figure 4-6

Dressings.

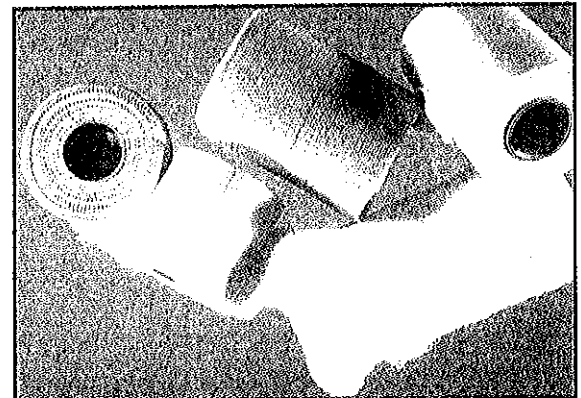


Figure 4-7

Bandages.

Sutures (Stitches)

If sutures are needed, they should be placed by a physician, usually within 6 to 8 hours of the injury. Suturing wounds allows faster healing, reduces infection, and lessens scarring.

Some wounds do not usually require sutures:

- Wounds in which the skin's cut edges tend to fall together
- Shallow cuts less than 1" long

Rather than close a gaping wound with butterfly bandages, cover the wound with sterile gauze. Closing the wound might trap bacteria inside, resulting in an infection. In most cases, a physician can be reached in time for sutures to be placed. Gaping wounds should be evaluated by a medical professional.

► Emergency Care Wrap-Up

Condition	What to Look For	What to Do
Serious external bleeding	Large amount of blood coming from an open wound	<ol style="list-style-type: none"> 1. Put on medical exam gloves (if available) and expose the wound. 2. Apply a gauze pad (dressing) and direct pressure. 3. Apply a pressure bandage over the gauze. 4. If blood soaks through the bandage, apply additional dressings and pressure bandage. 5. Call 9-1-1 if bleeding cannot be controlled.
Internal bleeding	Bruising Painful, tender area Vomiting or coughing up blood Stool that is black or contains bright red blood	Minor internal bleeding: <ol style="list-style-type: none"> 1. Follow these procedures: <ul style="list-style-type: none"> R = Rest I = Ice or cold pack C = Compress the area with elastic bandage E = Elevate if the extremity is injured Serious internal bleeding: <ol style="list-style-type: none"> 1. Call 9-1-1. 2. Care for shock. 3. If vomiting occurs, roll the victim onto side.
Minor wound	Small amount of bleeding	<ol style="list-style-type: none"> 1. Wash with soap and water. 2. Flush with running water under pressure. 3. Apply antibiotic ointment. 4. Cover with sterile or clean dressing. 5. For wounds with a high risk for infection, seek medical care for cleaning, possible tetanus booster, and closing.
Wound infection	Swelling and redness around the wound Sensation of warmth Throbbing pain Pus discharge Fever Swelling of lymph nodes Red streaks leading from the wound toward the heart	<ol style="list-style-type: none"> 1. Seek medical care.
Amputation	Loss of a body part	<ol style="list-style-type: none"> 1. Call 9-1-1. 2. Control bleeding. 3. Care for shock. 4. Recover amputated part(s) and wrap in sterile or clean dressing. 5. Seal wrapped part(s) in a plastic bag or waterproof container. 6. Keep part(s) cool, but not frozen.
Impaled object	Object remains in wound	<ol style="list-style-type: none"> 1. Do not remove object. 2. Stabilize the object with bulky dressings or clean cloths.

5

Shock

► Shock

Shock occurs when the body's tissues do not receive enough oxygenated blood. Do not confuse this with an electric shock or "being shocked," as in being scared or surprised. To understand shock, think of the circulatory system as having three components: a working pump (the heart), a network of pipes (the blood vessels), and an adequate amount of fluid (the blood) pumped through the pipes. Damage to any of the components can deprive tissues of oxygen-rich blood and produce the condition known as shock.

shock
Inadequate tissue oxygenation resulting from serious injury or illness.

Recognizing Shock

The signs of shock include the following:

- Altered mental status:
 - Agitation
 - Anxiety
 - Restlessness
 - Confusion
- Pale or bluish, cold, and clammy skin, lips, and nail beds
- Nausea and vomiting
- Rapid breathing
- Unresponsiveness (when shock is severe)

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

- Recognizing the signs and symptoms of shock and providing first aid for shock due to illness or injury

Care for Shock

To care for shock:

1. Place the victim on his or her back
2. Keep the victim warm.
3. Call 9-1-1.

FIYI

If the victim is vomiting, has heavy secretions, or if you must leave an unresponsive victim to call 9-1-1, roll the victim onto his or her side to allow the vomit or secretions to drain from the victim's mouth and to keep the airway clear.

► Anaphylactic Reaction

anaphylaxis

A life-threatening allergic reaction.

A life-threatening breathing emergency can result from a severe allergic reaction called **anaphylaxis**.

This reaction happens when a substance to which the victim is very sensitive enters the body. It can be deadly within minutes if untreated. Many of the deaths are caused by the inability to breathe because swollen airway passages block air to the lungs. The most common causes of anaphylaxis include the following:

- Medications (for example, penicillin and related drugs, aspirin, sulfa drugs)
- Food (for example, nuts, especially peanuts; eggs; shellfish)
- Insect stings (for example, honeybee, yellow jacket, wasp, hornet, fire ant)
- Plants (for example, inhaled pollen)

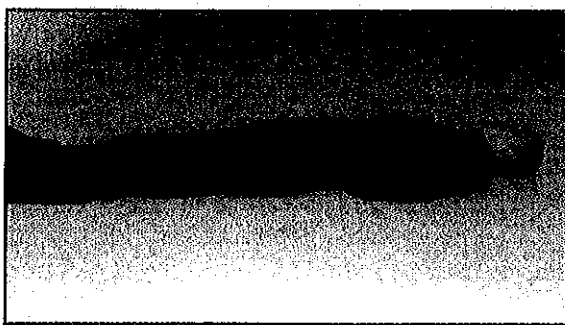


Figure 5-1

The shock position.

Recognizing Anaphylaxis

The most common signs of anaphylaxis include the following:

- Breathing difficulty—shortness of breath and wheezing
- Skin reaction—itching or burning skin, especially over the face and upper part of the chest, with rash or hives
- Swelling of the tongue, mouth, or throat

Other signs of anaphylaxis can include:

- Sneezing, coughing
- Tightness in the chest
- Blueness around lips and mouth
- Dizziness
- Nausea and vomiting

Care for Anaphylaxis

To care for anaphylaxis:

1. Call 9-1-1.
2. Determine if the victim has medication for allergic reactions. If the victim has a prescribed **epinephrine auto-injector** (Figure 5-2), help the victim use it. If you are assisting with or using an auto-injector, follow the steps in (Skill Drill 5-1).
3. Keep a responsive victim sitting up to help breathing. Place an unresponsive victim on his or her back (or side if vomiting occurs).

epinephrine auto-injector

Prescribed device used to administer an emergency dose of epinephrine to a victim experiencing anaphylaxis.

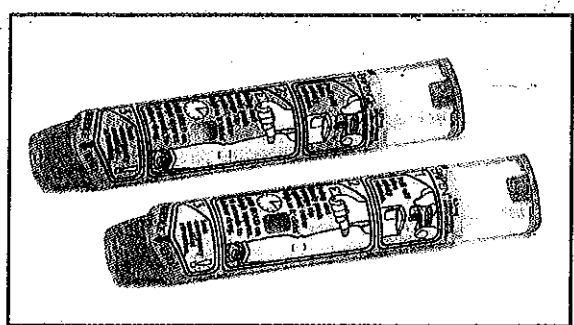


Figure 5-2

Prescribed epinephrine auto-injectors.

Epinephrine: A Lifesaver

Epinephrine constricts blood vessels and elevates blood pressure, dilates passages in the lungs to make breathing easier, and makes the heart beat stronger. These all help the anaphylaxis victim.

People who have severe allergic reactions may have a physician-prescribed epinephrine auto-injector, and may also need assistance with its use in an emergency. Two types of injectors are available:

- EpiPen (can only give 1 dose)
- Twinject (can give 2 doses)

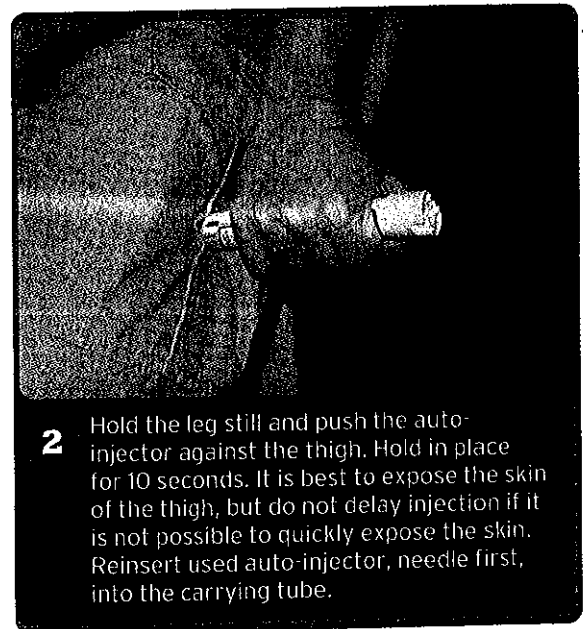
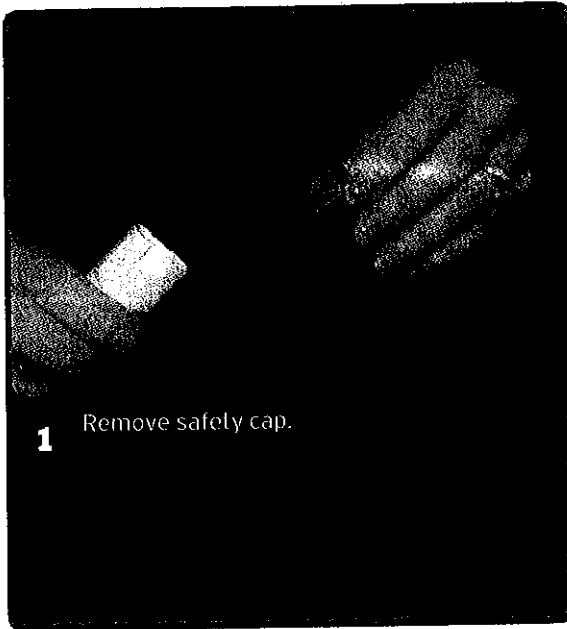
Each device is available in both adult and child dosages.

Epinephrine should be used only when the victim is showing signs of a severe allergic reaction, especially difficulty breathing.

skill drill

5-1

Using an Epinephrine Auto-Injector



► Emergency Care Wrap-Up

Condition	What to Look For	What to Do
Shock	Altered mental status (anxiety, restlessness; confusion) Pale, cold, and clammy skin, lips, and nail beds Nausea and vomiting Rapid breathing	<ol style="list-style-type: none"> 1. Place the victim on his or her back. 2. Keep the victim warm. 3. Call 9-1-1.
Anaphylaxis	Breathing difficulty Skin reaction Swelling of the tongue, mouth, or throat Sneezing, coughing Tightness in the chest Blueness around lips and mouth Dizziness Nausea and vomiting	<ol style="list-style-type: none"> 1. Call 9-1-1. 2. Determine if victim has a prescribed epinephrine auto-injector and help the victim use it. 3. Keep a responsive victim sitting up to help breathing. Place an unresponsive victim on his or her back (or side if vomiting occurs).

► Types of Burns

Burn injuries can be classified as thermal (heat), chemical, or electrical.

- *Thermal (heat) burns.* Thermal burns can be caused by flames, contact with hot objects, flammable vapor that ignites and causes a flash or an explosion, steam, or hot liquid.
- *Chemical burns.* Chemical agents can cause tissue damage and death if they come in contact with the skin. Three types of chemicals—acids, alkalis, and organic compounds—are responsible for most chemical burns.
- *Electrical burns.* The severity of injury from contact with electric current depends on the type of current (direct or alternating), the voltage, the area of the body exposed, and the duration of contact.

► Depth of Burns

Determine the depth (degree) of the burn. Historically, burns have been described as first-degree, second-degree, and third-degree injuries. Medical care professionals use the terms *superficial*, *partial thickness*, and *full thickness* because they are more descriptive of the extent of tissue damage.

Meeting OSHA Recommendation:

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

5. Responding to Non-Life-Threatening Emergencies

• Burns

- Assessing the severity of a burn
- Recognizing whether a burn is thermal, electrical, or chemical and the appropriate first aid
- Reviewing corrosive chemicals at a specific worksite, along with appropriate first aid

first-degree (superficial) burn

A superficial burn that affects the skin's outer layer.

Characteristics include redness, mild swelling, tenderness, and pain. Sunburn is a common example of a first-degree burn. Healing occurs without scarring, usually within a week.

second-degree (partial-thickness) burn

A partial-thickness burn that extends through the skin's entire outer layer and into the inner layer.

Blisters, swelling, weeping of fluids, and pain identify these burns. Intact blisters provide a sterile, waterproof covering. Once a blister breaks, a weeping wound results, and the risk of infection increases. Large second-degree burns require medical care.

third-degree (full-thickness) burn

A full-thickness burn that penetrates all the skin layers into the underlying fat and muscle.

The skin looks leathery, waxy, or pearly gray, and sometimes charred. A third-degree burn requires medical care.

- **First-degree (superficial) burns** affect the skin's outer layer (epidermis) **Figure 6-1**.

- **Second-degree (partial-thickness) burns** extend through the skin's entire outer layer and into the inner layer **Figure 6-2**.

- **Third-degree (full-thickness) burns** are severe burns that penetrate all the skin layers and the underlying fat and muscle **Figure 6-3**.

If a burn wraps all the way around a body part, such as a finger, toe, arm, or torso, this is a circumferential burn. A circumferential burn requires medical care.

► Extent of Burns

Part of determining the severity of a burn requires you to estimate how much body surface area the burn covers. You can use the Rule of the Hand to estimate the size of a burn. The victim's entire hand represents about 1% of his or her total Body Surface Area (BSA)

Figure 6-4

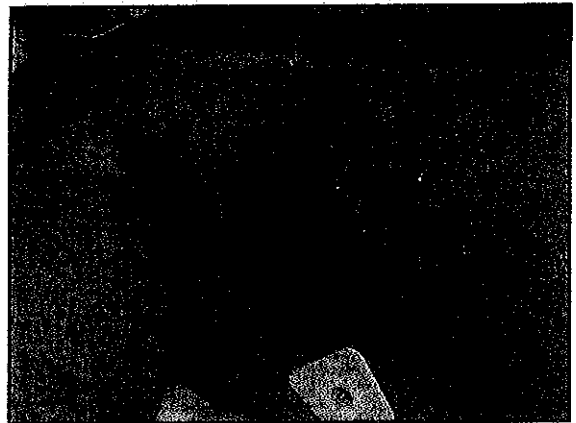


Figure 6-2

Second-degree burn.

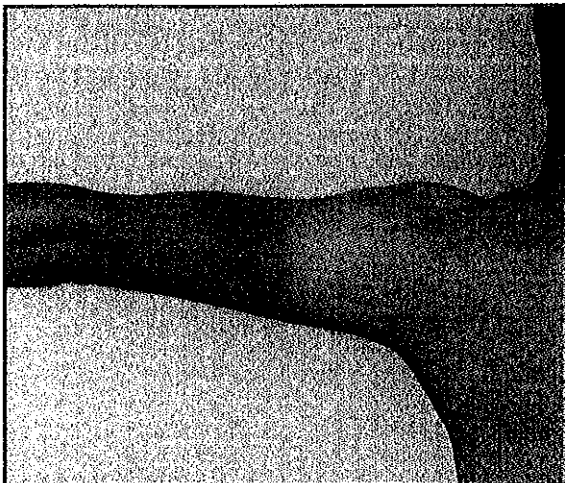


Figure 6-1

First-degree burn.



Figure 6-3

Second- and third-degree burns.

Determine which parts of the body are burned. Burns on the face, hands, feet, and genitals are more severe than on other body parts.

Determine whether other injuries or preexisting medical problems are present or if the victim is elderly or very young. A medical problem or belonging to one of these age groups increases a burn's severity.

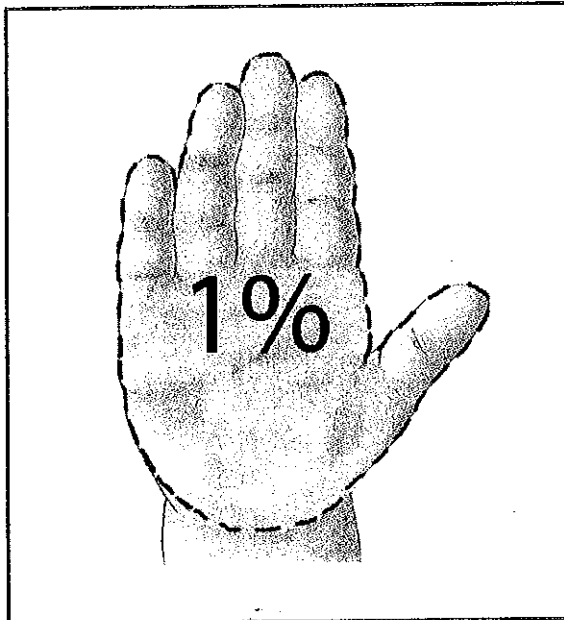


Figure 6-4

Rule of the Hand.

FYI

Respiratory Injuries

Inhaling air at a temperature above 300°F can cause death in minutes. The air temperature near the ceiling of a burning room may reach temperatures of 1,000°F or higher.

Death can occur when the mucous membranes lining the respiratory system secrete fluids that fill the lungs. Victims of heat inhalation can actually drown in their own secretions.

Damage from inhaling the super-heated air may cause swelling of the respiratory tract. As with burns of the skin, swelling does not occur immediately after the injury; The risk of airway obstruction is greatest 12 to 24 hours after the burn. All victims exposed to super-heated air require medical care.

► Care for Thermal Burns

Burn care aims to reduce pain, protect against infection, and determine the need for medical care. Most burns are minor and can be managed without medical care. If clothing is burning, have the victim roll on the ground using the "stop, drop, and roll" method. Smother the flames with a blanket or douse the victim with water.

Care for First-Degree Burns

1. Cool the burn with cool water until the part is pain free (this often takes 10 minutes)

Figure 6-5

2. After the burn cools, apply an aloe vera gel or skin moisturizer to keep the skin moistened and to reduce itching and peeling.
3. Give an over-the-counter pain medication such as ibuprofen.

Care for Small Second-Degree Burns (<10% BSA)

1. Cool the burn with cool water until the part is pain free (often takes 10 minutes).
2. After the burn has been cooled, apply antibiotic ointment. Do not apply lotions or aloe vera.
3. Cover the burn loosely with a dry, nonstick, sterile or clean dressing. Do not break any blisters.

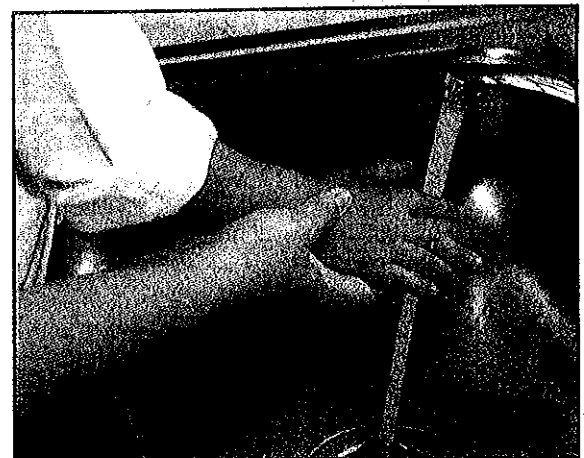


Figure 6-5

Cool first-degree and small second-degree burns until the pain is relieved. Cooling usually takes at least 10 minutes.

4. Give an over-the-counter pain medication such as ibuprofen.
5. Seek medical care.

Care for Large Second-Degree ($\geq 20\%$ BSA) and All Third-Degree Burns

1. Remove clothing and jewelry that are not stuck to the burned area.
2. Cover the burn loosely with a dry, nonstick, sterile or clean dressing.
3. Care for shock.
4. Call 9-1-1.

► Chemical Burns

A chemical burn results when a caustic or corrosive substance touches the skin **Figure 6-6**. Examples of such substances include acids, alkalis, and organic compounds. Because chemicals continue to burn as long as they are in contact with the skin, they should be removed from the skin as rapidly as possible.

First aid is the same for most chemical burns, except for a few specific ones for which a chemical neutralizer has to be used. Alkalis such as drain cleaners cause more serious burns than acids such as battery acid because they penetrate deeper and remain active longer. Organic compounds such as petroleum products are also capable of burning.



Figure 6-6

Chemical burn from sulfuric acid.

CAUTION

DO NOT apply water under high pressure—it will drive the chemical deeper into the tissue. Material Safety Data Sheets (MSDSs) provide information for handling particular substances and what to do if an incident occurs.

CAUTION

Put on medical exam gloves before helping a victim with chemical burns to protect your skin.

Care for Chemical Burns

1. Immediately flush the area with a large quantity of water for 20 minutes **Figure 6-7**. If the chemical is a dry powder, brush the powder from the skin before flushing with water **Figure 6-8**.
2. Remove the victim's contaminated clothing and jewelry while flushing with water.
3. Cover the affected area with a dry, sterile or clean dressing.
4. Seek medical care.

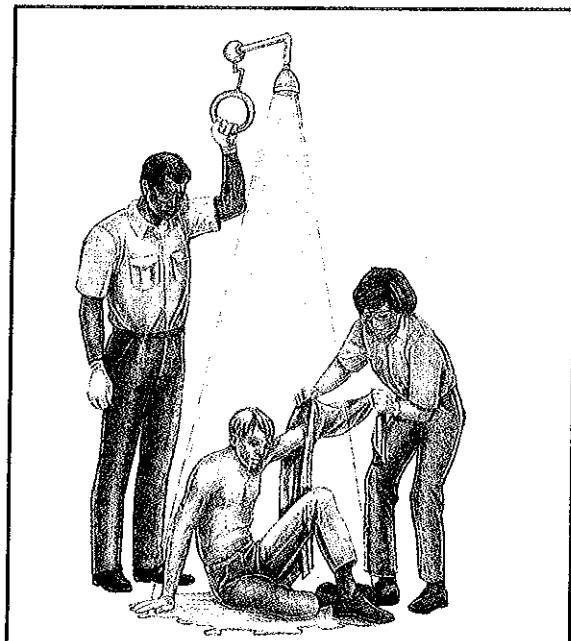


Figure 6-7

Flush a chemical burn with large amounts of running water.

► Electrical Burns

There are three types of electrical injuries: thermal burn (flame), arc burn (flash), and true electrical injury (contact). A thermal burn results when clothing or objects in contact with the skin are ignited by an electric current. These injuries are caused by the flames produced by the electric current, not by the passage of the electric current or arc.

An arc burn occurs when electricity jumps, or arcs, from one spot to another. Although the duration of the flash may be brief, it usually causes extensive superficial injuries.

A true electrical injury happens when an electric current passes directly through the body, which can disrupt the normal heart rhythm and cause cardiac arrest, other internal injuries, and burns. Usually, the electricity exits where the body touches a surface or comes in contact with a ground (for example, a metal object). This type of injury is often characterized by an entrance and exit wound **Figure 6-9**.

Care for Electrical Burns

1. Make sure the area is safe. Unplug, disconnect, or turn off the power. If that is impossible, call 9-1-1.
2. Check responsiveness and breathing.
3. Provide CPR if necessary.
4. Care for shock.
5. Cover the burned area with dry, sterile dressing.
6. Call 9-1-1.



Figure 6-8

Brush dry chemicals off.

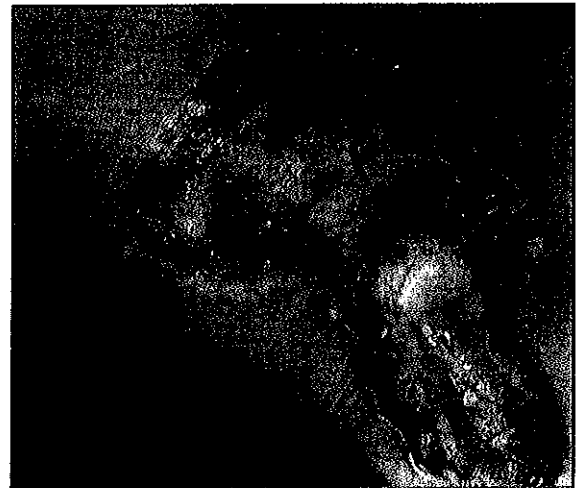


Figure 6-9

Electrical burn exit wound.

► Emergency Care Wrap-Up

Condition	What to Look For	What to Do
First-degree burn	Redness Mild swelling Pain	<ol style="list-style-type: none"> 1. Cool the burn with cool water. 2. Apply aloe vera gel or a skin moisturizer.
Small second-degree burn (<10% body surface area)	Blisters Swelling Pain Weeping of fluid	<ol style="list-style-type: none"> 1. Cool the burn with cool water. 2. Apply antibiotic ointment. 3. Cover loosely with a dry, nonstick, sterile dressing. 4. If available, give an over-the-counter pain medication. 5. Seek medical care.
Large second-degree (>10% body surface area) and third-degree burns	Dry, leathery skin Gray or charred skin	<ol style="list-style-type: none"> 1. Cover burn loosely with a dry, nonstick, sterile or clean dressing. 2. Care for shock. 3. Call 9-1-1.
Chemical burns	Stinging pain	<ol style="list-style-type: none"> 1. Flush with a large amount of water for 20 minutes. 2. Remove victim's contaminated clothing and jewelry while flushing. 3. Seek medical care.
Electrical burns	Possible third-degree burn with entrance and exit wounds	<ol style="list-style-type: none"> 1. Unplug, disconnect, or turn off the electricity. 2. Check responsiveness and breathing. 3. Provide CPR if necessary. 4. Care for shock. 5. Cover the burned area with dry, sterile dressing. 6. Call 9-1-1.