First-aid Manual
A Quick-reference Guide for the Medical Professional
First-aid Manual
Acknowledgments

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In your coursework, you learned about the top 10 emergencies that you may encounter. This First-aid Manual covers various other emergencies that may occur in or outside of a medical office. Refer to this guide frequently throughout your healthcare career for a refresher on how to react in various emergency situations.
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**Anaphylaxis**

Anaphylaxis is a rapid, severe immune reaction to an allergen that can quickly lead to death. An allergen is any substance that enters the body and causes a sensitive reaction by the immune system. The immune system considers the allergen to be a foreign body and reacts by attacking it. The attack is what causes the symptoms of an allergic reaction. An allergen can be a food, insect venom, medications or pollen. An allergen can also enter the body in any manner—by ingestion, inhalation, injection or absorption through the skin or mucous membranes. A normal allergic response to many of these irritants is very common.

However, when the immune system overreacts to the allergen, anaphylaxis occurs and the attack is especially severe. Anaphylaxis can lead to airway obstruction, anaphylactic shock, cardiovascular collapse and death. Immediate attention is important as soon as symptoms appear.

**Anaphylactic shock** is the most dangerous form of anaphylaxis. This is an acute generalized allergic reaction that occurs within minutes to hours after the body has been exposed to a foreign substance to which it is oversensitive.

**Symptoms:**

**Allergic reaction:**
- Itching
- Rash
- Redness
- Tightness in chest or throat
- Unexplained warmth

**Anaphylaxis:**

All of the above, plus:
- Anxiety
- Choking
- Congestion
- Coughing
- Diaphoresis (profuse sweating commonly associated with shock and other medical emergency conditions)
- Dizziness, fainting or loss of consciousness
- Dry, pale or blue skin
- Headache
- Hives
- Hypotension (low blood pressure)
• Itchy, red or watery eyes
• Low pulse rate
• Nausea, vomiting or diarrhea
• Shortness of breath
• Swelling
• Tachycardia (rapid heart beat)

### Steps to Take—Anaphylaxis

**Procedure Objective:** To assist a patient during an anaphylactic reaction

**Equipment Needed:** Telephone, emergency medications

1. Call 911 immediately.

2. If a physician is present, she may treat the patient with epinephrine to facilitate breathing and circulation, an antihistamine to reduce swelling or a steroid to minimize the immune system’s reaction.
Asthma Complications

Asthma is a chronic inflammation of the airways in the lungs. Asthma can become severe in reaction to allergens or other irritants, or when combined with other respiratory or gastrointestinal conditions. Complications can also occur in response to stresses like exercise, old age or pregnancy.

Symptoms:
- Coughing
- Shortness of breath
- Tightness in chest
- Wheezing
- Labored breathing
- Blue skin
- Peak flow meter reading of 50 percent or less of personal best

Steps to Take—Asthma Complications

**Procedure Objective:** To assist a patient experiencing an asthma emergency

**Equipment Needed:** Patient's inhaler, peak flow meter, telephone, emergency oxygen equipment, blood pressure cuff, stethoscope, asthma medications, ventilator

1. Ask the patient if she has an inhaler, and if she has not used it, do so now.
2. Take a peak flow reading—if peak flow is 50 percent or less, continue with emergency treatment.
3. If there is no doctor present, call 911.
4. Administer oxygen.
5. Help to calm the patient.
6. Monitor vital signs.
7. If a doctor is present, she may wish to administer epinephrine, prednisone, leukotriene inhibitors or other medications.
8. A mechanical ventilator may be required to keep the patient alive.
Bites

An animal or human bite can be dangerous because of the possibility of infection or rabies. Thoroughly clean all bites with soap and water and cover with a dressing. A physician should see any human or animal bite in which the skin is broken. The medical facility will then contact local health authorities, who will hold the animal for observation to determine if rabies is a factor. If rabies is present, or if the skin is broken and the animal can’t be tested, the patient will be given antirabies serum. If authorities can observe the animal and determine that it is free of rabies, no serum is necessary.

A snakebite will show a two-fang wound. Treatment has changed from past practices.

Snakebite Don’ts:

- Do not apply cold packs or ice.
- Do not apply a tourniquet.
- Do not cut into the wound or attempt to suck out venom.
- Do not apply any form of electric shock.

These past practices did little good and sometimes caused additional harm.

Simply clean the area and remove any surface venom. If there is any possibility that the snake was venomous, call 911. Immobilize the victim and if the bite is located on an extremity, try to maintain the extremity below the level of the heart.

There is also concern regarding human bites because of HIV and hepatitis B. If the bite breaks the skin and the infected person doing the biting has bleeding gums, he may transmit the disease to the victim. Clean the wound thoroughly and cover it with a sterile bandage. Transport the victim to a medical facility where a physician should examine him. Patients who have sustained such a bite from another person will be advised to receive hepatitis B immunization.

Rattlesnake bites can inject a lethal amount of venom and should be treated immediately.
Bone Injuries

Most injuries to muscles, bones and joints are usually not life threatening, but they are painful and, if not properly treated, can be disabling. Some bone injuries, such as those to the spinal cord, can be quite serious and can result in paralysis. However, these injuries are not typically seen in the ambulatory care setting.

Dislocation

Dislocation is an injury that temporarily deforms and immobilizes the joint and may result in sudden and severe pain. When a bone end slips out of the socket or when the capsule surrounding a joint is stretched or torn, a dislocation is likely to occur. At least half of all dislocations involve the shoulder. What looks like a dislocation could actually be a fracture, and should be treated by a physician.

Symptoms:

- Severe pain
- Deformity of the joint area
- Loss of function of the affected limb
- Noticeable swelling

If possible, splint the injury from the joint above to the joint below the injury. If a splint is not available, immobilize the dislocation by keeping it in the same position and supporting it with pillows during the trip to the medical office or hospital. Immobilize a dislocated shoulder by wrapping the affected arm to the body for support.

Fracture

Fractures are breaks in the bone caused by trauma or bone disease. There are several different types of fractures, but all are classified as either open fractures or closed fractures. An open fracture involves an open wound and is characterized by a protruding bone. A closed fracture means that the skin is not broken. Fractures are further defined as:

- Incomplete or greenstick: The bone has cracked but the break is not all the way through (frequently seen in children).
• **Simple:** Complete bone break in which there is no involvement with the skin surface.

• **Compound:** The bone protrudes though the skin surface, creating the possibility of infection.

• **Impacted:** The broken ends are jammed into each other.

• **Comminuted:** There is more than one fracture line and several bone fragments are present.

• **Spiral:** A fracture that occurs with a severe twisting action, causing the break to wind around the bone.

• **Depressed:** Occurs with severe head injuries in which a broken piece of skull is driven inward.

• **Colles:** Often caused by falling on an outstretched hand. Involves a transverse (crossways) fracture of the radius and sometimes the ulna also, which results in displacement, causing a bulge at the wrist.

To treat, control any bleeding and splint, or otherwise immobilize, without moving the bone ends. Transport the patient to a hospital or clinic. Check vital signs and watch for symptoms of shock. A fracture can only be accurately diagnosed by an x-ray unless you can see bone ends in an open wound or there is a severe deformity. A physician is the only person who should attempt to straighten, or **reduce** a fracture.
Burns

Burns are painful and traumatic, emotionally as well as physically. Treatment of burns can be grueling, and rehabilitation of severe burns is a long, slow and torturous process. Many burns cause permanent physical disfigurement, which can cause long-term or permanent emotional difficulties. Heat, chemicals, explosions and electricity commonly cause most burns.

Types of Burns

Thermal

Thermal burns are typically caused by residential fires, automobile accidents, playing with matches, accidents with gasoline, space heaters, electrical sources (such as faulty wiring, firecrackers, scalding water from the stove or tub) and children coming into contact with curling irons, stoves or irons. Some childhood burns, such as with cigarettes, can be traced to deliberate abuse. Sunburn is a thermal burn that results from overexposure to sunlight.

Chemical

Ingesting, inhaling or injecting acids or alkalines causes chemical burns. Chemical burns are most likely to occur on a worksite, often in an industrial facility.

Electrical

Electrical burns occur when the body touches an electric current from faulty wiring, high-voltage power lines or lightning. An electrical burn is usually life threatening. In addition to the burning, the electrical impulses can interfere with the body's own electrical mechanisms—most notably those that control the beating of the heart.

The victim of an electrical burn may be suffering from two burns: one where the power entered the body, and one where it exited. Often, the burns themselves may be minor. Of more serious consequence are the possibilities of shock, breathing difficulties and other injuries. CPR is often needed.

Do not go near a patient injured by electricity until you are sure the power has been turned off because you could be injured as well. If there is a downed line, call the power company and the fire department.

Classifications of Burns

Burns are classified in several ways. The most important classification systems focus on the amount of body surface involved and the penetration of skin layers. The level of penetration into the skin’s layers is expressed as the “degree” of the burn.
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First-degree Burns

First-degree burns are primarily damage to only the outer skin, or epidermis. The skin reddens, and there is moderately severe pain. The most common first-degree burn is a sunburn. Patients who are on photosensitive drugs should be warned about the increased danger from exposure to the sun. Warning labels will appear on prescription medications that are affected by sun exposure.

All patients should be advised to wear protective sunscreen and clothing when outside in the sun. Generally a soak in a tub of cool water and drinking plenty of fluids are the best treatment for a sunburn. Other first-degree burns can be wrapped with a cool-water dressing or immersed in cool water, then patted dry.

Second-degree Burns

Also called partial-thickness burns, these involve the epidermis and part of the dermis, the layer below the outer skin. Leakage of plasma and electrolytes from capillaries damaged by the burn causes blisters and results in moderate edema and pain.

Treatment of a second-degree burn is very similar to a first-degree burn—immerse the burned area in cool water, pat dry and cover the burn site with a sterile dressing. Do not apply ointment unless requested by the doctor, and advise the patient to not burst the blisters.

Third-degree Burns

Also known as full-thickness burns, these involve the epidermis, dermis and subcutaneous tissue, including fat, muscle and even bone and nerve. The skin has the appearance of white, leathery tissue and thrombosis, which is the formation of a blood clot. There is no pain immediately after the burn because nerve endings have been damaged and destroyed. The burned area can also appear charred black, brown or cherry red, with the underlying tissue appearing pearly white.

All third-degree burns should receive immediate professional medical care. If more than 10 percent of the body surface area is involved, surgical intervention is usually required, as well as IV fluids, pain medication and protection from tetanus.
Steps to Take—Third-degree Burns

Procedure Objective: To assist the patient with a third-degree burn

Equipment Needed: Telephone, sterile dressing, blankets

1. Call 911.
2. Cover the burn with sterile dressings.
3. Treat the patient for shock.
4. Do not attempt to remove clothing or other adhering materials as this will deepen the burn.
Cardiac arrest, or heart attack, is a serious, sudden heart condition usually characterized by varying degrees of chest pain or discomfort, weakness, sweating, nausea, vomiting and arrhythmia (without rhythm), sometimes causing loss of consciousness. It occurs when the blood supply to a part of the heart is interrupted, causing scarring and death of the local heart tissue. Since the area affected may be large or small, the severity of heart attacks vary, but they are often a life-threatening medical emergency which demand both immediate attention and a call to EMS.

Symptoms:

- Tightness of the chest
- Pain radiating down one or both arms
- Pain radiating into the left shoulder and jaw
- Rapid and weak pulse
- Diaphoresis
- Agitation

Time is critical, so prompt, appropriate treatment within the first hour of an attack can save the patient’s life and reduce damage.
Steps to Take—Cardiac Arrest

Procedure Objective: To assist a physician in treating a patient experiencing a heart attack

Equipment Needed: Wheelchair or chair with rollers; oxygen; BP cuff; EKG machine

If Physician is Present:

1. If the patient has medication such as nitroglycerine, it should be given immediately.
2. Depending upon severity of symptoms the physician may want to transfer the patient to an exam room. Never allow the patient to walk or carry objects such as a heavy purse or coat.
3. If you have a wheelchair, help the patient into the chair. In the absence of a wheelchair, use any chair with rollers to move the patient.
4. Perform an electrocardiogram and administer oxygen per physician order. Monitor vital signs. Loosen the clothing and elevate head of the exam table as high as possible.
5. Contact emergency medical services at physician’s direction.
6. Treat for shock by maintaining body heat, covering with blanket.
7. If the patient stops breathing, lower head of exam table and start artificial respiration.
8. If there is no pulse, start CPR.

If Physician is Not Present:

1. Call 911. You are NEVER wrong to call emergency services. Do not hesitate. Ask another staff member to call the physician.
2. If the patient has medication such as nitroglycerine, it should be given immediately, even in the reception room if necessary.
3. Administer oxygen while waiting for EMS. Provide reassurance.
4. Loosen patient’s clothing, position him sitting up as high as possible. A cool cloth to the forehead or around the neck is soothing while you wait for assistance. Cover the patient with a blanket to treat shock.
5. Monitor vital signs until paramedics arrive. Write these down to report to the paramedics and for your own documentation.
6. Do not waste time transferring the patient to an exam room. Keep him still.
Diabetes is a disease in which blood glucose levels are above normal. Most of the food we eat is turned into glucose, or sugar, for our bodies to use for energy. The pancreas, an organ that lies near the stomach, makes a hormone called insulin to help glucose get into the cells of our bodies. When you have diabetes, your body either doesn’t make enough insulin or can’t use its own insulin as well as it should. This causes sugar to build up in your blood.

Diabetes can cause serious health complications including heart disease, blindness, kidney failure and lower-extremity amputations. Diabetes is the sixth leading cause of death in the United States.

**Symptoms:**

People who think they might have diabetes must visit a physician for diagnosis. They might have SOME or NONE of the following symptoms:

- Frequent urination
- Excessive thirst
- Unexplained weight loss
- Extreme hunger
- Sudden vision changes
- Tingling or numbness in hands or feet
- Frequent fatigue
- Very dry skin
- Sores that are slow to heal
- More infections than usual

Nausea, vomiting or stomach pains may accompany some of these symptoms in the abrupt onset of insulin-dependent diabetes.

Diabetic patients may present emergency situations by becoming hyperglycemic or hypoglycemic. You will need to know how to respond to both situations.
Hyperglycemia

Hyperglycemia is caused by an increased amount of sugar in the blood. Eating too many carbohydrates, infection, fever, emotional stress or failing to take adequate insulin may trigger this response. If the condition remains untreated, the patient will fall into a diabetic coma. Before falling into a coma, the patient might experience the following symptoms:

Symptoms
- Confusion
- Excessive hunger or thirst
- Dizziness
- Frequent urination
- Weakness
- Nausea or vomiting
- Rapid pulse
- Deep, rapid breathing
- Dry, warm skin
- Very strong sweet, fruity breath odor
- Gradual onset of symptoms

Steps to Take—Alerts of Hyperglycemia or Hypoglycemia

Procedure Objective: To determine if a patient is hyperglycemic or hypoglycemic

Equipment Needed: Some form of sugar

1. Ask the patient questions. Can he talk? He may know his condition.
2. Ask the patient if insulin or food has been taken, and when.
3. Is the breath fruity or sweet-smelling?
4. Are respirations deep or shallow?
5. Fruity, sweet-smelling breath indicates hyperglycemia.
6. Deep breathing indicates hyperglycemia; shallow breathing indicates hypoglycemia.

If you cannot determine the condition:

1. Give the patient a little sugar regardless—hypoglycemia can cause irreversible brain damage.

Frequent fatigue may be an indication of diabetes.
If the patient lapses into unconsciousness, he may die if not treated quickly. Follow the steps outlined in the next procedure.

**Steps to Take—Hyperglycemia**

**Procedure Objective:** To assist a patient who is hyperglycemic

**Equipment Needed:** Telephone, some form of sugar, patient’s monitoring treatment equipment if available, insulin

**If the patient is conscious:**

1. Have the patient check his insulin/glucose level.
2. Give the patient a little sugar and see if his condition improves.
3. The patient should self-administer insulin if his personal readings indicate that his blood sugar levels are too high.

**If the patient is unconscious:**

1. Call 911 immediately.
2. If a physician is present, she may administer insulin.
3. The patient should be transported to the nearest hospital.
4. The patient will be checked for positive diagnosis and reduction of blood sugar.

Honey can be a quickly absorbed source of sugar.
Hypoglycemia

Hypoglycemia may occur from an excess amount of insulin in the body. This can happen if the patient has not eaten in regularly measured amounts, if he vomits after taking insulin, if he is engaging in excessive exercise or if he takes too much insulin. Left untreated, the patient will eventually experience insulin shock, which is characterized by fainting, seizure or coma.

Symptoms:

- Muscle weakness
- Headache
- Anxiety
- Dizziness
- Mental confusion
- Pounding heartbeat
- Shallow, rapid breathing
- Excessive hunger
- Diaphoresis
- Cold, pale and moist skin
- Unconsciousness, with or without seizures
- Rapid onset of symptoms

Steps to Take—Hypoglycemia

**Procedure Objective:** To assist a patient who is hypoglycemic

**Equipment Needed:** Some form of sugar and fat, IV fluids or injectable glucose, telephone

**If the patient is conscious:**

1. Give the patient a sugar, such as candy, and a fat such as peanut butter, to stabilize glucose levels.

**If the patient lapses into unconsciousness:**

1. Give the patient an intravenous form of glucose, either as an IV fluid or injectable.
2. Stay with the patient until he becomes conscious.

**If the patient doesn’t regain consciousness:**

1. Call 911.
2. The patient must be transported at once to a hospital.
Drug Overdose

A drug overdose can be intentional or accidental. Taking too much of a prescribed medication or taking the wrong medication can cause a drug overdose. Overuse of recreational drugs or attempts of suicide are considered intentional overdose. No matter the cause, a drug overdose is potentially life-threatening, so your quick actions can make all the difference! Symptoms will vary according to the type of drug taken, but there are some general signs you can watch for:

Symptoms:
- Unusual or absent vital signs
- Chest or abdominal pain
- Diarrhea, nausea or vomiting
- Shortness of breath
- Confusion or sleepiness
- Coma
- Unusual skin condition—either too cold or too hot, moist or dry

Steps to Take—Drug Overdose

Procedure Objective: To assist a patient who has overdosed

Equipment Needed: Telephone

1. Call 911.

2. If possible, find out what the patient took, how much and when. If the patient has the bottle, keep it and give to EMTs when they arrive.

3. Treatment varies according to type of drug ingested. Possible treatments include stomach pumping, administration of activated charcoal or if one is available, an antidote—another medication that can offset the effects of the overdosed drug. These treatments should be given by trained emergency doctors.

4. If you suspect that the patient may hurt himself or others he may need to be physically restrained. Get help from other staff members.

5. If a physician is present, he may administer a sedative to calm the patient until help arrives.
Foreign Bodies, Eye Irrigation and Ear Irrigation

Foreign bodies are substances or objects that become lodged in any part of the human body where they do not belong. This usually occurs in the eye, ear or nose.

It is common for a speck of dirt, soot from a fire or an eyelash to lodge in the eye.

Steps to Take—Foreign Bodies in the Eye

Procedure Objective: To remove a foreign body from the eye

Equipment Needed: Cotton, tissue, or sterile gauze, water, cotton swab, possibly an eyewash and cold compress

LOWER LID:
1. Remove with a bit of cotton or a fold of tissue moistened with water.

UPPER LID:
1. Pull the upper lid down over the lower lid to remove it.
2. Grasp the eyelashes and carefully turn back the upper lid over a cotton swab. Then remove the object with a folded piece of moistened sterile gauze.
3. If unsuccessful, or the material is on the cornea, flush the eye with large amounts of water to dislodge.

UNSUCCESSFUL REMOVAL:
1. Do not attempt to remove the foreign body. Place a sterile compress over both eyes to keep the injured eye from moving.
2. Tell the patient not to rub the affected eye, which would only imbed the object deeper into the cornea.
3. The patient must see a doctor to have the object removed.

When chemicals, either liquid or powder, get into the eyes, use a sterile eye irrigation solution to dilute and neutralize the chemical. Drip the solution into the eye continuously for 20 minutes. Often prepackaged solutions are kept in the physician’s office for emergency use. If you find yourself in a situation where a sterile solution is not available, use any clean tap or bottled water to flush the eye.
Steps to Take—Eye Irrigation

**Procedure Objective:** To perform eye irrigation

**Equipment Needed:** Emesis, or waste, basin; sterile irrigation solution warmed to body temperature (98.6 degrees); sterile gloves; sterile tubing or bulb syringe; sterile cotton balls or 4 x 4s; pillow; towel

1. Wash hands.
2. Identify the patient and explain the procedure.
3. Help patient to supine position on exam table with head on pillow.
4. Check the label three times on the solution bottle. Also, check the expiration date.
5. Tilt the patient’s head toward the affected eye. Place a towel on his shoulder.
6. Place basin beside the affected eye for solution to drain into.
7. Put on sterile gloves.
8. Moisten 2-3 cotton balls with solution and clean the eyelids and lashes of the affected eye from inner to outer canthus, or corner. Discard after each wipe.
9. With your thumb and index finger, gently pull down the lower eyelid to expose the conjunctiva, the membrane covering the inner eyelid and eyeball.
10. Have patient stare at a fixed spot.
11. Irrigate the affected eye with sterile solution by resting the tip of the sterile bulb syringe or end of sterile tubing on the bridge of the nose, being careful not to touch the eye or conjunctiva with the tip.
12. Allow the fluid to flow from the inner to outer canthus of the eye.
13. Afterwards, dry the eyelid and lashes with sterile cotton balls.
14. Discard used supplies in biohazard container.
15. Remove gloves.
16. Wash hands.
17. Document the procedure.

Note that if you are to irrigate both eyes, use different supplies and equipment (including your gloves) for each, so you won’t transmit any contamination from one eye to the other.
Steps to Take—Ear Irrigation

**Procedure Objective:** To perform ear irrigation

**Equipment Needed:** Basin of irrigation solution warmed to body temperature (98.6 degrees), thermometer, gloves, emesis basin, ear syringe/bulb, towels, cotton balls, otoscope

1. Wash hands.
2. Identify the patient and explain the procedure.
3. Inform the patient that she may experience minor dizziness from the solution.
4. Have the patient sit with her head tilted toward the affected ear and use an otoscope to **visualize**, or look into, the affected ear canal.
5. Put on gloves.
6. Cleanse outer ear with a wet cotton ball that has been moistened with irrigation solution.
7. Place towel on the patient’s shoulder. Have patient hold the basin under her affected ear.
8. Fill syringe with warmed solution. Use about 30-50 mL at a time. Expel air from syringe.
9. Gently pull **auricle**, the outer part of the ear, upward and back in order to straighten the ear canal.
10. Insert the syringe tip into affected ear. Be careful not to insert too deeply. Do not completely **occlude**, or block, the canal.
11. Direct flow of the solution upward toward roof of ear canal, then allow solution to drain out into basin.
12. Repeat procedure, noting contents in the returned solution.
13. Dry the outer ear and visualize the inner ear again with the otoscope to verify that the irrigation has removed the wax or other foreign body.
14. Remove basin and towel. Provide dry cotton balls for the patient to blot any further drainage.
15. Dispose of supplies. Remove gloves.
16. Wash hands.
When the foreign body is a large, smooth object, instillation of an oil will make it more difficult to grasp and retrieve. In this case, use forceps on the nose, and forceps or water irrigation of the ear by directing water against the wall of the external canal. **Caution: Never use water with any object, such as beans or peas, that could swell. This will cause pain and make removal much more difficult.**

You may get a call from a parent who is frightened because a child has swallowed a small object. The physician will usually order an x-ray to visualize the object and determine if it is actually in the stomach. If the object is not sharp, it will probably pass through the intestinal tract and be eliminated in the stool.

**Splinters**

Splinters can generally be removed with a needle at home or with a splinter thumb forceps in the office.

**Steps to Take—Splinters**

**Procedure Objective:** To remove a splinter

**Equipment Needed:** Soap, water, sterilized needle, tweezers or splinter thumb forceps, bandage

1. Wash the affected area with soap and water.

2. Use a sterilized needle, or sterilize the needle by holding it over a flame until it is thoroughly heated and then cooled.

3. Make a slit over the splinter.

4. Lift the end of the exposed splinter with the needle, and remove by grasping with a pair of tweezers or a splinter thumb forceps.

5. If a splinter or thorn is under a fingernail, it is best to have a physician remove it.

6. After the splinter or thorn is removed, the area should again be washed with soap and water and covered with an adhesive bandage.
Frostbite and Hypothermia

Windy, subfreezing weather creates the greatest risk for frostbite. Frostbite occurs when small body parts with a high ratio of surface area or tissue mass (fingers, toes, ears and the nose) are exposed to extreme cold. Larger areas of the extremities are vulnerable in even more dangerous temperatures. This cold exposure causes tissues to freeze and cells to eventually die. If the nerves and blood vessels have been severely damaged, gangrene may follow and amputation may eventually be required.

The type and duration of contact are the two most important factors in determining the extent of frostbite injury. Touching cold fabric is not nearly as dangerous as coming into direct contact with cold metal, particularly if the hands are wet or even damp. The skin is usually cemented instantly to the cold metal and is torn off when the hand is removed.

Symptoms:

- Skin discoloration
- Burning and/or tingling sensations
- Partial or complete numbness
- Possibly intense pain
- If left untreated, frostbitten skin gradually darkens after a few hours. Skin destroyed by frostbite is completely black and looks loose and flayed, as if burnt.

Caused by extreme cold, hypothermia often results in disorientation.

Getting the hypothermia victim warm is the first priority.
Steps to Take—Frostbite

Procedure Objective: To assist the patient with frostbite

Equipment Needed: Warm area and blanket

1. Move the victim to a warm, safe area.
2. If medical attention is easily reachable, wrap the affected areas with dressings and/or cloths.
3. If it is unlikely that the affected areas can be kept thawed, treatment should not be carried out—thawing followed by a second round of freezing can cause more extensive and severe damage to the frostbitten areas.
4. Place the affected areas in warm (not hot) water, until the areas are soft and sensation has returned.
5. Wrap the areas in clean, sterile dressings and attempt to reach medical help. If hypothermia has occurred, treat the hypothermia first.

Frostbite even looks painful.

Hypothermia occurs when the patient’s body temperature falls to a dangerously low level. Treatment for hypothermia involves raising the core body temperature of the victim.

Symptoms:
- Confusion
- Cold skin
- Shiver
To Treat Hypothermia:

**DO NOT:**
- Rub or massage the patient.
- Give alcohol.
- Give food or drink (this includes warm drinks).
- Treat any frostbite.

Any of these actions will divert blood from the critical internal organs and may make the situation worse.

**DO:**
- Keep the patient lying down.
- Call 911.

Steps to Take—Hypothermia

**Procedure Objective:** To assist the patient with hypothermia

**Equipment Needed:** Telephone, shelter, bath filled with lukewarm water, hot water bottles, thermometer, dry clothes

1. Call 911.
2. Get the patient to shelter.
3. If possible, put the patient in a bath with medium-temperature water, with the clothes on.
4. Place hot water bottles (wrapped in a cotton sock) in the patient’s armpits and between his legs.
5. Monitor the patient and be prepared to give cardiopulmonary resuscitation.
6. Remove wet clothing if and only if a dry change is available.

If the hypothermia has become severe, notably if the patient is incoherent or unconscious, re-warming must be done by trained professionals. Bystanders should only remove the patient from the cold environment and call emergency services to get advanced medical care as quickly as possible.
Heat Cramps, Heat Exhaustion and Heatstroke

Extreme heat causes heat cramps, heat exhaustion and heatstroke, so you will encounter these emergencies most often during the summer, or in extremely warm climates.

Heat cramps result from profuse sweating after a period of physical exertion in a hot environment. When sweating heavily, the body loses a lot of sodium, or salt. When the sodium deficit gets high enough, the body’s muscles can’t function and begin to cramp. So even though sweating is a healthy reaction to heat—it cools the body—too much sweating can cause an adverse reaction. This does not indicate a severe problem. Cramps occur most commonly in the calves of the legs and in the abdomen. Cramps may also occur in the hands, arms and feet.

Symptoms:
- The patient’s skin is cool and usually wet.
- Mental status and blood pressure should be normal, although an increased pulse rate is common.

Steps to Take—Heat Cramps

Procedure Objective: To assist the patient having heat cramps

Equipment Needed: Water, fruit juice or electrolyte replacement drink, salt

1. Heat cramps signal the need for cooling and rest.
2. In uncomplicated cases, the patient is often able to take fluid by mouth.
3. Nausea may make intravenous infusion of 0.9% sodium chloride appropriate.
4. If the patient is able to take fluid by mouth, add ½ to 1 teaspoon of salt per pint of water or fruit juice or give a commercial electrolyte solution.

Heat exhaustion results most often from physical exertion in the heat without adequate fluid replacement. Body temperature usually remains normal or only slightly above normal.
Symptoms:
- Headache
- Fatigue
- Dizziness
- Moist, pale skin
- Rapid pulse
- Low blood pressure
- Increased respiratory rate

Heat stroke is a true emergency. The body is no longer able to compensate for the rise in body temperature. Core body temperature threatens brain damage as it rises rapidly past 105°F. Heat stroke victims can deteriorate quickly into a coma.

Symptoms:
- Seizures
- Possible hot, flushed and dry skin
- Rising, then falling vital signs

Steps to Take—Heat Stroke

Procedure Objective: To assist the patient during a heat stroke

Equipment Needed: Water, ice or wet sheets

Heat stroke demands rapid cooling.

1. The patient should be moved quickly to a cool area.
2. Remove clothing.
3. Place cold water, ice, or wet sheets on the patient’s body.

Note: Ice should never be applied directly to skin—it must be in a wrap or towel of some kind.

4. Concentrate on cooling down the core surface areas: the scalp, neck, axillae and groin.
5. Give the patient oxygen.
6. Place on a cardiac monitor.
7. Transport the patient to the hospital as quickly as possible.
8. Continued cooling enroute is required.
Hemorrhage

When you encounter an emergency involving bleeding, it is important to determine the source and the severity of the hemorrhage. Bleeding is the loss of blood from the body, but the term hemorrhage refers to excessive, uncontrolled bleeding. Bleeding is more dangerous for children, as they have less blood to lose. The average adult human will be in medical danger after a loss of 1 liter (2 pints) and could die of shock if more blood is lost. The human body generates blood at a rate of about 2 liters (2 quarts) per week.

Sources of Hemorrhage

Bleeding can be of three types: arterial, or from the arteries, venous, from the veins and capillary, from the capillaries in the skin.

Arterial Bleeding

Arterial bleeding occurs from arteries, the major blood vessels that carry oxygen-rich blood from the heart throughout the body. This type of bleeding is characterized by spurts with each beat of the heart, is bright red in color (although blood darkens when it meets the air) and is usually severe and hard to control. Arterial bleeding requires immediate attention. If the ruptured artery is a large branch, death can occur in three minutes or less.

Venous Bleeding

Venous bleeding occurs from veins, vessels which return the blood to the heart. Venous bleeding is characterized by a steady flow and the blood is dark, almost maroon in shade. Venous bleeding is easier to control than arterial bleeding.

Capillary Bleeding

Capillary bleeding occurs from capillaries, the smallest of our body’s blood vessels. It is usually slow, oozing in nature and has a higher risk of infection than other types of bleeding. This type of bleeding will often clot without first-aid measures being taken.

Steps to Take—Hemorrhage

Procedure Objective: To assist the patient during a hemorrhage

Equipment Needed: Clean cloth or gauze squares

1. Cover the wound with a clean cloth or pad of gauze squares.
2. Exert pressure directly on the bleeding area.
3. Elevate the body part that is bleeding.
4. If the bleeding appears to be arterial, apply pressure at the pressure point to the wound to stop the flow of blood to the area.
Internal Bleeding

Internal bleeding is bleeding inside the body, and therefore hard to detect by simple observation. But there are symptoms to watch for if you are concerned that this may be occurring.

Symptoms:

- Rapid, weak pulse
- Shallow breathing
- Cold clammy skin
- Dilated pupils
- Dizziness
- Faintness
- Thirst
- Restlessness
- A feeling of anxiety
- Coughing up bright red blood may indicate a lung hemorrhage or a ruptured vessel in the esophagus, a life-threatening emergency.
- Vomiting bright red blood could mean an ulcer has started bleeding.
- Vomiting what looks like coffee grounds could indicate chronic, slow bleeding of the stomach.
- Coal-black, tar-like stools suggest a loss of blood in the intestines.
- Bright red rectal bleeding indicates a lesion in the rectum or lower colon.
- Severe abdominal pain caused by a trauma is associated with internal bleeding from a ruptured organ, such as a kidney, liver or spleen.

Surgery is the only treatment for internal bleeding, so if you suspect internal bleeding, call 911 immediately. Keep the patient in a recumbent position with strictly limited movement until the surgery is performed.

Pressure Points

Applying pressure to the body's pressure points is sometimes the only way to stop arterial bleeding. Pressure points are points on the body where an artery is close to the skin. The following figure illustrates the various arterial pressure points on the human body. Pressure on these points will slow bleeding to the entire area where the wound is located. Grasp the pressure point proximal to the injury and hold it tightly. Do not use a tourniquet unless you are in a remote location and death is imminent.
Vaginal bleeding refers to bleeding in females that is either a physiologic response during menses, or menstruation, or caused by hormonal or organic problems of the reproductive system. Vaginal bleeding may occur at any age, but always needs investigation when encountered in children or postmenopausal women.

Symptoms:

- Heavy bleeding (soaking more than one pad per hour)
- Passing something that looks like tissues (Place the tissue in a container and take it with you to the hospital.)
- Severe cramping (like a menstrual period)
- Cramping or bleeding accompanied by fever
- Abdominal pain

Vaginal bleeding during pregnancy may indicate a possible pregnancy complication. During pregnancy, mild to moderate blood loss may be due to a rupture of a small vein on the outer rim of the placenta. It can also be a symptom of a miscarriage or ectopic pregnancy, which is why urgent ultrasound is required to determine the cause. Bleeding in early pregnancy may be a sign of a threatened or incomplete miscarriage. Call 911, and have the patient transported to a hospital immediately.
Impaired Consciousness

If a patient in the office or clinic “feels faint,” she is probably feeling lightheaded and weak.

Symptoms:
- Pale, perspiring, cold or clammy skin
- Nausea
- Lack of balance

Steps to Take—Fainting

**Procedure Objective:** To assist a patient who has fainted

**Equipment Needed:** Cold compress, stethoscope, watch, thermometer

1. Gradually lower patient to a flat surface.
2. Loosen any tight clothing.
3. Check breathing.
5. Elevate the legs if there is no back or head injury.
6. If vomiting occurs, place the patient on her side.
7. Apply a cold compress to the forehead.
8. Monitor vital signs to determine if she is stabilized before allowing her to leave.

Fainting is not serious, but 911 or EMS may need to be called if vital signs are abnormal—the fainting could be a symptom of a more complex medical condition.
**Insect Stings**

Bees, wasps and hornets cause deaths every year. If the victim is not sensitive to the sting, the result may only be a painful swelling with redness and itching. Remove the stinger by scraping it with the straight edge of a thumbnail or a credit card. Never grasp the stinger with your fingers or a tweezers, as this will inject more venom.

Treatment involves taking an antihistamine to lessen the reaction and applying an ice pack to reduce swelling. Be alert for breathing problems if the sting was in an area that may block breathing.

When a patient is severely allergic to stings, the stings can cause acute illness. The severely allergic patient should always have a special emergency kit close at hand when there is a possibility of a sting. If the patient experiences any of the following symptoms, he should be quickly transported to the nearest medical facility.

**Symptoms:**

- Restlessness
- Headache
- Shortness of breath
- Skin is a mottled blue color
- Shock symptoms
- Severe nausea, vomiting or bloody diarrhea

**Steps to Take if the patient is not sensitive to the insect sting:**

1. Remove the stinger by scraping it with the straight edge of a thumbnail or credit card.
2. Apply an ice pack to reduce swelling.

**Steps to Take if the patient is allergic to a sting:**

1. Assist patient with emergency kit, such as an epipen, if available.
2. Call 911 if patient experiences restlessness, headache, shortness of breath, blue skin color, shock, nausea, vomiting or bloody diarrhea.

A wasp bite can be very painful and result in an allergic reaction in some people.
Lightning Strike

People struck by lightning carry no electrical charge and can be handled safely.

Steps to Take—Lightning Strike

**Procedure Objective:** To treat a victim of lightning strike

**Equipment Needed:** Telephone, emergency kit, emergency respiratory equipment

1. Call 911.

2. The injured person has received an electrical shock and may be burned, both where he was struck and where the electricity left his body. Check for burns in both places. Being struck by lightning can also cause nervous system damage, broken bones and loss of hearing or eyesight.

3. Give first-aid. If breathing has stopped, begin rescue breathing.

4. If the heart has stopped beating, give CPR.

5. If the person has a pulse and is breathing, look and care for other possible injuries.
Nosebleeds

Nosebleeds, or epistaxis, usually follow injury, either external or internal, such as a blow to the nose. Breathing dry air, nose picking, putting a foreign body in the nose or a chronic condition, such as a nasal or sinus infection that results in capillary congestion and bleeding, or the inhalation of irritating substances can also cause epistaxis. Other factors that can be causes of nosebleeds are high blood pressure, anticoagulation drugs, chronic aspirin use and blood diseases such as anemia, hemophilia and leukemia.

Treatment varies depending on the cause, location and severity. Even moderate bleeding is of concern if it persists longer than 20 minutes after pressure is applied.

Symptoms:

- Severe blood loss
- Lightheadedness
- A drop in blood pressure
- Rapid pulse
- Dyspnea—difficulty in breathing and pain
- Pallor
- Other indications of shock

Steps to Take—Nosebleeds

Procedure Objective: To stop a nosebleed

Equipment Needed: Ice pack

1. Elevate the patient’s head for 5 to 10 minutes.
2. Apply ice or cold compresses to nose.
3. Prevent the patient from swallowing his blood. Instead let it drip into a basin to determine the amount of blood loss.
4. Ask the patient to avoid talking or blowing his nose.
5. Watch for excessive blood loss and signs of shock.
Poison is a substance that causes injury, illness or death, especially by chemical means. It can be eaten, drunk, inhaled, injected or absorbed through the skin. The table below outlines the various causes and symptoms of poisoning.

<table>
<thead>
<tr>
<th>Common Types of Poisoning</th>
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<tbody>
<tr>
<td><strong>Cause</strong></td>
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<tr>
<td>Food poisoning</td>
</tr>
<tr>
<td>Carbon monoxide</td>
</tr>
<tr>
<td>Bee sting</td>
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</tbody>
</table>

**Steps to Take—Poisoning**

**Procedure Objective:** To assist the patient with general poisoning

**Equipment Needed:** Wet washcloth, water and phone

1. Ask the patient what was taken, how much and when.
2. If the poison is an inhalant, take the patient to an area with fresh air. Call 911. The patient may require pulmonary resuscitation until help arrives and then will need 100% oxygen and immediate care in a hospital.
3. If the poison is affecting the skin, remove the clothing and wash the skin thoroughly unless you suspect that a dry powder is the cause of the poisoning.
4. If the poison is in the eye, flush the eye thoroughly for at least 15 minutes.
5. If the poisoning was ingested, dilute the poison with large amounts of warm water or milk.
6. Induce vomiting if the poison is:
   - A strong alkali, acid or petroleum product
   - Plants or mushrooms
   - Bacterial poisoning from contaminated shellfish
   - Give the patient syrup of ipecac or activated charcoal or press the back of the patient’s tongue to induce vomiting.
7. **Do not induce vomiting if the poison is:**
   - A corrosive substance such as a household cleaner
8. After you have performed this initial treatment, call the poison control center (1-800-222-1222) for further advice.
9. Keep the patient as quiet as possible.
A **psychiatric disorder** is a recurring thought process or behavior that causes harm to the individual and is not considered normal. Psychiatric disorders can include many different conditions, including depression, bipolar disorder and schizophrenia. Often these conditions don’t develop until a person reaches his late teens to early twenties. Researchers don’t know why these disorders develop, but they can be triggered by a **stressor**, a life-changing event such as losing your job, parents’ divorce or even a positive change such as going to college. Alcohol and drugs can also trigger a mental disorder.4

Psychiatric conditions can develop over time or can occur suddenly, creating a **psychiatric emergency** in your office. A **psychiatric emergency** is any behavior by a patient or other visitor that has the potential to cause harm to himself or others. A patient who suddenly begins throwing equipment and instruments in the treatment room because you advised him to get a flu shot would be considered a psychiatric emergency. Another example might be a patient who begins mumbling incoherently and doesn’t respond to your voice. It can be a scary situation for you, but there are signs you can watch for in patients to find out if a psychiatric emergency is happening in your office.

**Symptoms:**

- Confusion
- Difficulty concentrating
- Sudden change in mood
- Violent behavior
- Inability to function
- Hallucinations
- Paranoia
- Unreasonable anger or sadness
- Recurrent thoughts of death or suicide
- Increase in risky behavior
- Hearing voices

**Steps to Take—Psychiatric Disorder**

**Procedure Objective:** To assist a patient experiencing a psychiatric episode

**Equipment Needed:** Intercom, telephone, blood pressure cuff, stethoscope

1. Notify the physician and staff immediately.
2. Call 911 as directed.
3. Try to calm the patient and any family members present.
4. Take the patient’s vital signs if possible.
5. Document the patient’s behavior.
Respiratory and Circulatory Emergencies

Respiratory (breathing) and circulatory (blood flow) emergencies occur for a variety of reasons, including choking, shock, allergies, drowning or electrical shock. When someone stops breathing, you will learn to give artificial breathing quickly. Without a constant supply of oxygen, brain damage or death will occur in a matter of minutes. Artificial breathing is literally breathing for another person. You are providing the victim with enough oxygen to maintain life until he resumes breathing or until help arrives. You can perform artificial breathing in several ways. In the medical office, you will have a respirator or oxygen tank and mask, but elsewhere you will probably rely on mouth-to-mouth resuscitation.

When circulatory, or blood circulation, problems such as cardiac arrest, accompany the breathing problem, artificial, or rescue breathing, must be accompanied by chest compressions. This procedure is known as cardiopulmonary resuscitation (CPR).

Basic Life Support (BLS) measures help a person who is at risk for respiratory arrest, cardiac arrest or both. It includes methods such as CPR. CPR, which stands for cardiopulmonary resuscitation, is the primary method used to support blood flow to the heart and brain in cardiac arrest victims. BLS is used to keep a person alive until advanced medical assistance arrives. It is NOT a substitute for a doctor’s care. The steps of BLS are abbreviated CAB. You may have heard of the ABC’s of an emergency; however, in 2010, the American Heart Association updated their guidelines in the BLS sequence. The old method of the ABC’s—Airway, Breathing, Chest compressions—focused on providing rescue breathing. The new method, CAB—Chest compressions, Airway, Breathing—focuses on giving the victim chest compressions first and foremost.

The CAB steps of an emergency are as follows:

- C is for Chest compressions
- A is for Airway
- B is for Breathing

Normal respiratory rates, by age:

Newborns: Average 44 breaths per minute
Infants: 20-40 breaths per minute
Preschool children: 20-30 breaths per minute
Older children: 16-25 breaths per minute
Adults: 14 to 18 breaths per minute
Older Adults: 19-26 breaths per minute.
The reason for the change from A-B-C to C-A-B is that chest compressions were often delayed while the responder opened the victim’s airway to administer mouth-to-mouth. The change to C-AB allows chest compressions to be administered much sooner, with minor delay of ventilation. This immediate administration of chest compressions provides rapid blood flow to the heart and brain.

Let’s look at a step-by-step process of how to perform CPR using the new C-A-B method:

1. Call 911 or ask another person to call.
2. Attempt to get the victim to respond. If he doesn’t, roll the victim on his back.
3. Begin chest compressions. Place the heel of your hand in the center of the victim’s chest. Place your other hand on top of the first one with your fingers interlaced.
4. Press down so you compress the chest at least two inches in adults and children and 1.5 inches in infants. The AHA states the most effective rate for chest compressions is 100 compressions per minute—the same rhythm as the beat of the Bee Gees’ song, “Stayin’ Alive.”
5. If you’ve had CPR training, you can next open the airway by tilting the victim’s head and lifting his chin.
6. Pinch the victim’s nose closed. Take a normal breath. Next, cover the victim’s mouth with yours to create an airtight seal, and then give two, one-second breaths as you watch for the chest to rise.
7. Continue with 30 compressions and two breaths until help arrives.
Steps to Take—Blocked Airway

Procedure Objective: To clear a blocked airway of an unconscious victim

Equipment Needed: Gloves or gauze

1. Place the victim in a supine position.

2. Use the jaw-thrust maneuver to move the tongue from back of throat. Listen for air exchange at mouth and nose, and sense for exhaled air on rescuer’s cheek.

3. Check for mouth obstruction. NOTE: Visible foreign matter and vomitus should be removed quickly. Liquids should be wiped out with covered middle and index fingers; solid material is swept out with a hooked index finger.

4. Check for air exchange. If none, then sit astride the victim’s thighs. With fingers pointed towards the head, place the heel of one hand flat on the victim’s abdomen, slightly above the navel.

5. Place your other hand in a like position over the first.

6. With your elbows straight, press inward and upward with quick thrusts to dislodge the block.
**Abdominal Thrust or Heimlich Maneuver**

Another common cause of a blocked airway in adults is choking, or food in an air pocket while eating. This occurs when someone sucks partially chewed food into the windpipe when talking, laughing or coughing while eating. Children, on the other hand, can get toys, toy parts, buttons or candy and a variety of other objects caught in their throats that obstruct the airway. Pieces of food are also a problem for children, especially raw carrots and hot dogs. Most everyone is familiar with the dangers of filmy plastic sacks and bags because of all the warning labels, but one of the most common airway obstructers is the latex balloon. Safety authorities believe no young children should have a balloon unless it is made of mylar. Children ages four to eight require supervision if playing with or trying to inflate latex balloons.

**Symptoms:**
- Clutching the throat
- Inability to speak, cough or breathe

You will use the **abdominal thrust** to relieve a blocked airway due to a foreign body in a conscious person. You may know it as the **Heimlich maneuver**.
Steps to Take—Abdominal Thrust or Heimlich Maneuver

Procedure Objective: To clear a blocked airway in a conscious person

Equipment Needed: None

1. While standing behind the victim, reach around the waist.
2. Clench one hand to make a fist and grasp your fist with the other hand.
3. Place the thumb side of the fist against the midline of the victim’s abdomen between the waist and the rib cage.
4. Thrust fist inward and upward in quick, firm movements to move air out of the lungs with enough force to dislodge the block.
5. A choking victim who is by herself may use the abdominal thrust with the fist or may bend over a chair back or any hard object of appropriate height in order to simulate an abdominal thrust on herself.

If a patient is in an advanced stage of pregnancy or is very obese, abdominal thrusting will not be possible. Use a chest thrust to dislodge the material.

Steps to Take—The Chest Thrust

Procedure Objective: To clear a blocked airway in a pregnant or obese person

Equipment Needed: None

1. Standing behind the victim, place arms around the victim directly under the underarms.
2. Using the abdominal clenched fist technique, place the thumb over the sternum, place your hand over the fist and give firm thrusts, pulling straight back toward yourself.
After ensuring that the victim’s airways are clear, check his breathing. If the victim is still not breathing, the next step to take is mouth-to-mouth resuscitation.

**Steps to Take—Rescue Breathing**

**Procedure Objective:** To perform mouth-to-mouth resuscitation

**Equipment Needed:** Respirator if available, gauze squares, sanitizing material

1. Determine whether unresponsive victim is breathing.
2. Position victim in supine position on firm surface.
3. Rescuer is positioned at victim’s side near head and shoulders.
4. Check airway. Swipe the mouth to clear any blockage.
5. Use jaw-thrust maneuver to move the tongue from back of throat.
6. Assuming you do not have a respirator, position victim to open airway. Pinch nostrils together with fingers while placing heel of hand on forehead to maintain head tilt.
7. Take a normal breath, seal your mouth over victim’s and breathe into victim’s mouth for one second.
   - If the victim is an infant, place your mouth over the infant’s mouth and nose and breathe gently for one second.
   - If the victim is a child, pinch the nostrils and place your mouth over the child’s mouth and breathe gently for one second.
8. Turn your head to one side, listen and feel for return of air. Watch chest for movement. If breathing has not begun, adjust the victim’s head tilt and chin lift, and try once more. Take a breath between each rescue breath. If patient is still not breathing normally, check the pulse.
9. Be ready to begin chest compressions.
Circulation

After the patient has resumed breathing, the next focus is on circulation. Check for a carotid pulse by placing your index and middle fingers into the natural groove at the side of the victim’s neck and below the ear. Check carefully because pulse will probably be weak. The pulse check should be done in conjunction with assessment for signs of circulation, which includes evaluation of the victim for breathing, coughing, and movement. This assessment should take no more than 10 seconds. If the patient doesn’t have a pulse, then CPR must be performed.

The following CPR procedure assumes the lone rescuer is a person without the benefit of devices to observe standard precautions. If you were in a situation where this procedure is performed occasionally, such as in a physician’s office, additional equipment would be available. For example, gloves should be put on prior to Step 5, which involves placing a finger or fingers in the victim’s mouth. A ventilation barrier device of some form should also be accessible to prevent transmission of pathogens to or from the victim. This device would be inserted or applied prior to Step 6.

If a second rescuer arrives, then the responsibility can be shared with one person continuously giving the chest compressions while the second gives two breaths immediately following each 30th compression. The procedure may be presented in a slightly different form when you take your CPR certification class. In that case, follow the procedure recommended by your certified instructor.

Standard guidelines have previously indicated that CPR should continue until the rescuer is exhausted and can no longer continue. This has been modified for some situations. In a remote location, for example, where no help is or will be available, standard guidelines recommend that if no signs of life occur after 15 minutes, the chance that CPR alone can restore heartbeat is very slim, the victim has for all purposes died and there is no possibility of meaningful survival. The key to this evaluation is “no signs of life,” which means no pulse, no gasping respiration, no maintenance of body temperature with progressive coloring of the skin and persistently fixed and dilated pupils. As hard as it may be to accept, continuation of CPR will not change the outcome. After following the blocked airway and breathing Steps to Take that you learned in the previous sections, and the patient has started breathing, but has no pulse, perform the following Steps to Take.
Steps to Take—CPR for Adults

Procedure Objective: To perform CPR on an adult

Equipment Needed: Gauze squares, sanitizing material

1. Victim must always be in a recumbent position on firm surface (floor or ground).
2. Rescuer is positioned at victim’s side near head and shoulders.
3. Remove clothing covering the chest so you can see chest movement.
4. Locate the lower margin of the victim’s rib cage and follow it to the notch where the ribs meet the sternum in center of chest.
5. Place index finger of your hand on lower end of sternum.
6. Place the heel of the other hand on lower sternum just above your index finger.
7. Place heel of both hands, one on top of the other, on sternum and lace fingers. Hold fingers high, away from the body.
8. Rise on your knees so your shoulders are directly over hands on victim’s sternum. Lock your elbows and keep arms straight.
9. Use a smooth, even motion to push straight down on chest and compress about one and one-half to two inches for a count of 30 compressions. A count of one and, two and, three and, etc. will help you obtain correct time. (The rate of compressions is approximately 100 times per minute.)
10. Allow time for the chest to re-expand between compressions.
11. After administering 30 compressions, give victim two rescue breaths. Key Point: Do this without moving from your position beside body.
12. Repeat four cycles of compressions and respirations before pausing to check for breathing, signs of circulation and presence of carotid pulse. Key Point: If no pulse is felt, resume compressions and respirations. Check every few minutes.

(Continued)
13. You must not discontinue CPR unless victim recovers, someone takes over for you or a physician pronounces the victim dead. If you are in a remote location, consider the guidelines discussed previously.

**Note:** In March 2008, the American Heart Association added Hands-only CPR for bystanders who aid adult cardiac arrest victims outside the hospital setting. Hands-only CPR has two steps:

1. Call 911.
2. Push hard and fast in the center of the chest.

The CPR procedure has some variations when used for a child or infant. Infants are generally considered to be less than one year of age and children ages one to eight. Adult procedures are used for anyone over eight. As some steps vary slightly from those outlined above, the entire procedure beginning with checking for responsiveness is given.
Steps to Take—CPR for Infants and Children

Procedure Objective: To perform CPR on an infant or child

Equipment Needed: Respirator and gloves if available, gauze

1. Gently shake and call to a child, or flick the bottom of an infant’s foot to check for consciousness.
2. Tell another person to call 911.
3. Place infant or child on back on firm surface.
4. Use appropriate method to open the airway.
5. Perform rescue breathing.
6. Remove clothing from chest so you can watch movement.
7. Check pulse.
   
   For infant: Check pulse over brachial artery by putting your middle fingertips on inside of upper arm halfway between elbow and shoulder. At the same time keep airway open.
   
   For child: Check carotid pulse on lower neck as for an adult. Check pulse in conjunction with assessment for signs of circulation, which includes evaluating victim for breathing, coughing or movement. This assessment should take no more than 10 seconds.
8. If pulse is present,
   
   For infant: Continue rescue breathing until normal breathing occurs or help arrives.
   
   For child: Continue rescue breathing until normal breathing occurs or help arrives.
9. If no pulse is present, start chest compressions.
   
   For infant:
   • Use the index and middle fingers to compress just below the nipples in center of chest.
   • Press the chest down 1/3 to 1/2 of the chest depth.
   • Give 30 compressions at a rate of 100 per minute.
   • Count as one, two, three, four, five.
   • Give two rescue breaths after each set of 30 compressions.

(Continued)
For child:
- Place the heel of only one hand between the child's nipples, at the tip of the breastbone.
- Press the chest down 1/3 to 1/2 of the chest depth.
- Give 30 compressions at a rate of 100 times per minute.
- Count as one, two, three, four, five.
- Give two rescue breaths for each set of 30 compressions.

10. Do 10 cycles of compressions and breaths, and then check for signs of circulation and pulse. **NOTE: Do not take more than five seconds for this check.**

11. Continue cycle of 30 compressions and two breaths until the victim resumes breathing and pulse returns, or until help arrives.

If a physician or an employee within a medical facility performs CPR, you must record the incident on a chart. If the victim is not a patient, create a new chart and record the incident. As soon as care is provided, a doctor-patient relationship is established and there are legal responsibilities.
Seizure

A seizure is an episode of spasms (involuntary muscle contractions), fainting and loss of motor control due to abnormal activity in the brain. Seizures may occur when the patient has high body temperature, head injuries, brain disease or a brain disorder, such as epilepsy. A Grand Mal seizure is a severe involuntary contraction of muscles that first causes the patient to become rigid and then to have uncontrollable movements. The patient becomes unconscious and may be injured during the seizure.

Symptoms:

- Skin of the face and lips appears bluish due to lack of oxygen
- No breathing
- Loss of bladder and bowel control
- Tongue biting

When the seizure has stopped:

- Confusion
- Complaint of headache and exhaustion

A Petit Mal seizure is less dramatic but still a significant event.

Symptoms:

- Inability to respond (but not loss of consciousness)
- Staring
- Tremors or somewhat less obvious rigidity and movements
Steps to Take—Seizure

Procedure Objective: To assist the patient during a seizure
Equipment Needed: Blanket

During the Convulsive Phase:

1. Do not restrain movement.
2. Move objects out of the way that might cause injury.
3. Do not force any object between the patient’s teeth or it could cause vomiting, aspiration or spasm of the larynx.

Following the Convulsion:

1. Turn the head to the side to prevent choking from profuse salivation.
2. Allow the patient to rest or sleep after the seizure is over.
3. Artificial respiration should be given if necessary.
4. Provide emotional support as the patient regains composure.
5. Try to alleviate any feelings of embarrassment.

Shock

A lack of oxygen to the individual cells of the body causes shock, which is an immediate response by the body tissues when they aren’t receiving oxygen.

The body initially adjusts for shock by increasing the strength of contractions of the heart, increasing the heart rate and constricting the blood vessels. As shock progresses, the body has difficulty trying to adjust and eventually tissues and body organs will sustain such severe damage that the shock becomes irreversible.

Types of Shock

Shock is one of the leading causes of death in a critically ill person. There are several types of shock, and can be caused by various factors.

- The loss of blood or other body fluids causes hypovolemic shock. If hypovolemic shock occurs due to blood loss it can also be called hemorrhagic shock. Dehydration caused by diarrhea, vomiting or heavy sweating can also lead to hypovolemic shock.
- Cardiogenic shock is the most extreme form of heart failure, occurring when the function of the left ventricle is so compromised that the heart can no longer adequately pump blood to body tissues.
Neurogenic shock is caused by a dysfunction of the nervous system. The diameter of the blood vessels in the body can no longer be controlled, which leads to dilation. Once the blood vessels are dilated, there is not enough blood in the circulation to supply the body with oxygen, thus causing shock.

Anaphylactic shock is an acute generalized allergic reaction that occurs within minutes to hours after the body has been exposed to a foreign substance to which it is oversensitive.

Septic shock is caused by a generalized infection of the bloodstream in which the patient appears seriously ill. It may be associated with an infection such as pneumonia or meningitis, or it may occur without an apparent source of infection, especially in infants and children. The patient may have become ill suddenly, or the illness may have developed over several days.

Symptoms:

- Sudden drop in blood pressure
- Pale or discolored, cold, clammy skin
- Weak or rapid pulse
- Irregular, shallow or rapid breathing
- General weakness
- Dilated pupils
- Anxiety or confusion
- Reduced urination
- Loss of consciousness

Steps to Take—Management of the Patient in Shock

Procedure Objective: To assist the patient in shock

Equipment Needed: Telephone, emergency oxygen supply, blanket

Remember: Shock can be the result of many types of medical emergencies. The following should serve as a general guideline for managing a patient in shock.

1. Call 911.
2. Check your CABs and make sure the patient is breathing and has a pulse.
3. Control any bleeding.
4. Administer oxygen.
5. Immobilize due to possible spinal injuries.
6. Splint any fractures.
7. Prevent loss of body heat by covering the victim with a blanket.
8. Transport to the closest hospital as soon as possible.
Spinal Injuries

With injuries from falls, vehicles, gymnastic equipment, diving and athletics, there is always the chance of cervical spine injury.

Symptoms:
- Back injury
- Neck injury
- Whiplash

Steps to Take—Spinal Injuries

Procedure Objective: To assist a victim of a spinal injury

Equipment Needed: Telephone

When there is a spinal injury and ventilation or CPR is not required, and when the person is not in any danger from the surroundings:

1. Call 911.
2. Provide emotional support and do not move the victim.
3. Watch for signs of shock.
4. EMS personnel will attach a collar to support the victim’s neck and position her on a board to prevent any additional back or neck injury during transport.

Neck and spinal injuries are very serious and require immobilization and immediate attention.

In some cases you may need to perform CPR until emergency help arrives.
Steps to Take—CPR Following a Spinal Injury

Procedure: To assist a victim requiring emergency ventilation or CPR following a spinal injury

Equipment Needed: Telephone, respirator if available, gloves, gauze

1. Call 911.

2. To avoid further injury if the victim is lying face down or on his side, the rescuer must roll the victim to a supine position in such a way that the head, shoulders and torso move together as a unit, without twisting, on a firm, flat surface. If two people are available, one should move the head and neck as the other turns the rest of the body.

3. To open the airway, perform the jaw-thrust maneuver—grasp the angles of the victim’s lower jaw with both hands and lift the jaw. Do not tilt the head.

4. Check for obstructions.

5. Perform mouth-to-mouth resuscitation.

6. If efforts to provide resuscitation fail to ventilate the victim, perform the jaw-thrust maneuver and check for obstructions again.

7. Check that you have a good seal over the victim’s mouth by checking for dislodged dentures or complete absence of teeth.

8. Readjust or remove dentures and try again.

9. Continue until the patient begins breathing or EMS arrives.
Sprain

A sprain is an injury to a joint, often an ankle, knee or wrist when the ligaments tear. Most sprains are minor and heal quickly. Others are more severe, with swelling of the area, and may not heal properly if the patient continues to put stress on the sprained joint. Sprains are usually the result of twisting the joint and are sometimes so severe that a fracture may also occur. A common site for this is the ankle. Old injuries are most susceptible to a sprain. If the patient is in doubt about the seriousness of the injury or how to care for it, it is most likely a sprain.

Symptoms:

- Inability to put any weight on the injured joint or to move it
- Injured area looks crooked or has lumps and bumps (other than swelling)
- Numbness, redness, swelling and pain

Treat a sprain by elevating it and applying ice for the first 24 hours. An elastic bandage will provide support to the area while it heals. A cravat bandage, a folded, triangular bandage, will provide good support to a sprained ankle.

Strain

A strain is an injury to the soft tissue between joints that involves the tearing of muscles or tendons. Strains often occur in the neck, back or thigh muscles. Strains are the result of overuse of a muscle or group of muscles, such as improper lifting, slipping while moving a heavy object or engaging in a strenuous activity that you are not accustomed to doing.

Symptoms:

- Muscle pain, spasms, cramping and weakness
- Swelling
- Partial loss of muscle function

Treatment involves the patient resting the injured muscles in a comfortable position, alternating ice and heat applications, and if it is very painful, a physician may prescribe an analgesic or muscle relaxant.
Stroke

A cerebrovascular accident (CVA) is an acute neurological injury that interrupts the blood supply to a part of the brain. You may also hear the term apoplexy used, but you are probably more familiar with CVAs under the more common term, strokes.

The patient who exhibits any of the warning signs of stroke needs immediate emergency assistance to ensure quick recovery. An American Medical Association poll showed that approximately one-third of patients with a complete stroke die as a result of the condition. Quick, appropriate intervention in many cases reverses damage caused by blood vessel occlusion, or blockage of blood flow through arteries or veins, and restores patients to their prior state of health. The American Heart Association has adopted a series of actions for EMS and emergency personnel to evaluate and react to strokes. It involves initial field evaluation criteria, rapid transportation, medical evaluation and CT scan interpretation.

There is a wide range in the severity of strokes. A light stroke will cause very little damage, whereas a more extensive one can cause immediate paralysis in the form of sagging muscles on one side of the face or the inability to use an arm or leg. One entire side of the body may be paralyzed.

Symptoms:

- Numbness
- Unequal size of eye pupils
- Mental confusion, slurred speech
- Nausea, vomiting
- Difficulty in breathing and swallowing
- Loss of control of urine and bowels

Steps to Take—Stroke

Procedure: To assist a patient having a stroke

Equipment Needed: Telephone

1. Call 911.
2. Avoid any unnecessary movement of the patient.
3. Keep in mind that the patient who appears to be unconscious or is unable to speak may be able to hear what is being said.
4. Loosen the clothing.
5. Ensure that the patient is not choking on excess saliva.
Wounds

A wound is an injury in which the skin or another external surface is torn, pierced, cut or otherwise broken. Wounds are also classified as open or closed wounds. A closed wound has no break in the skin. A bruise, or hematoma, is the collection of blood from internal bleeding, and is a common closed wound. An open wound represents a break in the skin and can be classified as an abrasion, avulsion, incision, laceration or puncture wound. It is important to know the characteristics and be able to identify and treat many types of wounds.

Most closed wounds are not serious. If there is pain and swelling, the application of a cold compress can be effective. Protect the patient’s skin by placing a cloth beneath the source of cold; apply for 20 minutes, then remove for 20 minutes. A common procedure for treating closed wounds is to RICE it:

- Rest
- Ice
- Compression
- Elevation

Hematomas can also develop in organs, and can be very serious if the bleeding is not stopped. If the patient is in severe pain and was subject to an injury caused by high impact, call for help and keep the patient comfortable until help arrives. Watch for symptoms of shock and monitor the patient’s vital signs.

Open Wounds

Open wounds can be minor tears in the skin or more serious breaks, but all open wounds represent an opportunity for microorganisms to gain entry and cause an infection. Some major open wounds may involve heavy bleeding, which should be controlled, probably by suturing. A tetanus injection is indicated for an open wound if the patient has not had a booster in the past seven to ten years. Let’s take an in-depth look at the various types of open wounds.

Abrasions involve a scrape of the epidermis with dots of blood and possibly the presence of foreign material, such as dirt or gravel. Because nerve endings are involved, they can be painful. They are not usually serious, unless they cover a large area of the body. Administer first-aid by cleaning the area carefully with soap and water; apply an antiseptic ointment if prescribed by a physician and cover with a sterile dressing.

Incisions are wounds that result from a sharp object, such as a knife or piece of glass. Incisions may need sutures. Clean the wound with soap and water and apply a sterile dressing.

A laceration is a tearing of body tissue and is more difficult to clean, so care must be taken to avoid infection. If there is not severe bleeding, which in itself is a cleansing mechanism, these wounds may need to be soaked to remove debris. If there is severe bleeding, it must be controlled immediately. Lacerations with severe bleeding are likely to need suturing.
Avulsion is the term used for skin that is torn off with profuse bleeding. Avulsion wounds often occur at exposed parts: fingers, toes or ear. First, control bleeding if necessary, and then clean the wound. If there is a skin flap, reposition it. Apply a dressing, then bandage as necessary. Note that pieces of the body may be torn away. If possible, save the body part, keep it moist and transport it with the patient.

A puncture wound is one made with a pointed object, such as an ice pick, knife or nail. Punctures pierce and penetrate the skin and may be deep wounds while appearing insignificant. Usually, external bleeding is minimal, but the patient should be assessed for internal bleeding. Because a puncture wound can be deep, the risk of infection is great and the patient should be advised to watch for signals of infection, such as pain, swelling, redness, throbbing and warmth. Clean the wound area. If needed, enlarge the hole with a probe to allow for irrigation with antiseptic solutions.

A gunshot wound entrance will be a small deep puncture site with possible evidence of powder burns. The exit area may be considerably larger and have irregular borders. This type of wound should be treated by a physician.

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**Steps to Take—Clean Wound Areas**

**Procedure:** To clean a wound

**Equipment Needed:** Basin, mild detergent, warm water, sterile gauze sponges, sterile sponge forceps, latex or vinyl gloves, sterile water, irrigation syringe, biohazardous waste bag, bandage

1. Remove large pieces of dirt or other debris from the wound with cleaned tweezers. Do not push the tweezers deeply into the wound.

2. Gently scrub the wound under running tap water using a mild soap to remove any debris, blood and bacteria.

   (Note: If you are cleaning a wound near the eye, do not get soap in the eye.)

   Human skin cannot be sterilized, but harmful microorganisms can be washed off the skin’s surface with soap, water and friction. Applying a disinfectant following the washing will make the skin essentially germ free. Cleaning a wound is usually the responsibility of the medical assistant.
Bandaging Wounds

**Sterile dressings** are items such as 4 × 4 absorbent gauze sponges, and non-adhering dressings that have been processed for use on open wounds. Sterile dressings are generally prepackaged in small quantities but may come in bulk containers. They are manufactured in different sizes and shapes, each for a specific use. Dressings should be handled using sterile techniques to maintain their sterility.

A sterile dressing is considered contaminated, or unsterile, when it is damp or wet, its wrapper is damaged, it is outdated or it is removed improperly from the wrapper or container. Sterile dressings are used directly over a wound to:

- Cover and protect from contamination
- Absorb drainage such as blood or serum
- Exert pressure (direct pressure on an open wound to slow bleeding)
- Hide disfigurement during the healing process
- Hold medications against the wound to facilitate healing

**Bandages** are strips of woven materials. Typically absorbent, they are used on many wounds to:

- Apply pressure to control bleeding
- Hold a dressing in place
- Protect dressings and wounds from contamination
- Immobilize an injured part of the body
- Support an injured part of the body
Read the following steps to take to learn how to correctly apply bandages in various situations.

**Steps to Take—Apply Bandage in Recurrent Turn to a Finger**

**Procedure Objective:** To apply a dressing to a wound and then cover with bandage

**Equipment Needed:** Scissors, dressing, bandage, latex or vinyl gloves, biohazardous waste bag

1. Assemble supplies.
2. Carefully open dressing without contaminating, and place over injured area.
3. Secure dressing with gauze bandage. **NOTE:** Start at the proximal end of the finger on the palm side and then directly over the finger to the proximal end on the back of the hand, and repeat several times.
4. Hold recurrent turns in place with spiral turns.
5. Secure by tying off gauze at wrist. **NOTE:** Tie off using a figure-eight turn. (See below)

6. From the finger, take the end of the bandage diagonally across the back of the hand to the wrist.
7. Circle the wrist once or twice.
8. From the opposite side of the wrist, continue back to finger and loop.
9. Repeat the figure eight several times. Tie off at wrist, or tape in place. **NOTE:** It is difficult to tear and handle tape while wearing gloves.
10. Discard contaminated materials and gloves in biohazardous waste bag.
Steps to Take—Apply Bandage in Open or Closed Spiral

**Procedure Objective:** To apply open- and closed-spiral bandage

**Equipment Needed:** Bandage, adhesive tape, scissors, sterile dressing, biohazardous waste bag

1. Assemble needed supplies.
2. Carefully place dressing over wound area without contaminating.
3. Anchor bandage by placing end of bandage on bias at starting point.
4. Encircle part, allowing corner of bandage end to protrude.
5. Turn down protruding tip of bandage.
6. Encircle part again.

7. Continue to encircle area to be covered with spiral turns spaced so that they do not overlap. You can also form closed spiral by continuing to encircle with overlapping spiral turns until all open spaces are covered.
8. Complete bandage by tying off or taping in place.
Steps to Take—Apply Figure-eight Bandage to Hand and Wrist

Procedure Objective: To apply a figure-eight bandage to hand and wrist neatly to secure dressing

Equipment Needed: Sterile dressing, bandage, latex or vinyl gloves, scissors, biohazardous waste bag

1. Assemble needed supplies.
2. Carefully place dressing over wound area without contaminating.
3. Anchor bandage with one or two turns around palm of hand.
4. Roll gauze diagonally across front of wrist and in figure-eight pattern around the hand.
6. Discard contaminated materials and gloves in biohazardous waste bag.
Steps to Take—Apply Cravat Bandage to Forehead, Ear or Eyes

Procedure Objective: To apply a cravat bandage to the head

Equipment Needed: Sterile dressing, cravat bandage, latex or vinyl gloves, biohazardous waste bag

1. Assemble needed supplies.
2. Carefully place dressing over wound area without contaminating.
3. Place center of cravat over dressing.
4. Take ends around to opposite side of head and cross them. Do not tie.
5. Bring ends back to starting point and tie them.
6. Discard contaminated materials and gloves in biohazardous waste bag.
Steps to Take—Apply Triangular Bandage to Head

**Procedure Objective**: To apply a triangular bandage to the head

**Equipment Needed**: Triangle bandage, sterile dressing, latex or vinyl gloves, biohazardous waste bag

1. Assemble needed supplies.

2. Carefully place dressing over wound area without contaminating.

3. Fold a hem about two inches wide along base of bandage.

4. With hem on outside, place bandage on head so that middle of base is on forehead close to eyebrows and point hangs down back.

5. Bring two ends around head above ears and cross them just below bump at back of head.

6. Draw ends snugly around head and tie them in center of forehead.

7. Steady head with one hand and with other hand draw point down firmly behind to hold dressing securely against head. Grasp point and tuck it into area where bandage ends cross.

8. Discard contaminated materials and gloves in biohazardous waste bag.