Resources to Complete Advanced First-Aid Certification

A WIDE VARIETY of illnesses and injuries require some medical treatment but are not life-threatening. By familiarizing yourself with first-aid supplies and techniques, you may help someone avoid an unnecessary trip to the emergency room. However, it is still important to know when to seek additional medical help. In this unit, you will learn how you can use first-aid supplies to treat common ailments (e.g., cuts and scrapes) as well as more serious problems that need immediate treatment while help is on the way.

Objective:

Explain advanced first-aid techniques and treatments.

Key Terms:

black eye
choking
contusion
cuts and scrapes
fainting
first-degree burns
fishhook sticks
fractures
frostbite
hypothermia
lacerations
poison
recovery position
second-degree burns
shock
shock position
splint
splinters
sprains
strains
third-degree burns
unconsciousness

Advanced First Aid

A well-stocked first-aid kit is an essential part of preparing for an emergency situation. You must have necessary supplies, but it is important to make sure all items are usable (not expired). In addition, you need the skills and knowledge to be able to use the supplies properly.

MEDICATIONS

Medications and pharmaceutical liquids should be checked regularly for expiration dates. In some cases, they must be kept in cool environments. Some active ingredients are only active for a certain period of time, even if the product is not open.

You must read and follow the directions for administering any medications, drugs, or pharmaceuticals. You also must read labels to determine the correct dosage for the victim. The proper authorities must be contacted in the event of an overdose.

FIGURE 1. Medications in first-aid kits should be checked regularly for expiration dates. Expired items may be ineffective, even if the product has never been opened.

COMMON USES OF MEDICATIONS

Control Allergic Reactions

Allergy medications, or antihistamines, are commonly found in first-aid kits. Antihistamines treat allergic reactions, which result from a person's exposure to an allergen. Airborne pollens, bee stings, and foods (e.g., peanuts) are common allergens.

Prevent Infections

Providone-iodine or antiseptic solutions (e.g., Betadine) are antimicrobial ointments that kill germs to prevent infection. These ointments may be applied directly to a wound but are also applied via an adaptic gauze bandage. Antiseptic solutions are used to clean the skin before surgery or invasive procedures.

Reduce Inflammation

Aspirin, acetaminophen, and ibuprofen are all anti-inflammatory medications. They are used to relieve minor aches and pains, and they may help reduce a fever. Only adults should take aspirin, but acetaminophen and ibuprofen are safe for children.

Protect Skin

Calamine lotion is a skin protectant used to soothe and protect skin following minor skin irritations (e.g., itching, pain, or discomfort). It calms rashes from poison ivy, poison oak, poison sumac, and other such irritants.

Reduce Contamination

Antimicrobial lotions or liquid disinfectants reduce the contaminants (e.g., bacteria) that may transfer from the victim to the first responder and vice versa. These are applied prior to and following the administration of first aid.

Aid in Healing Process

Antimicrobial ointment helps fight bacteria and aids in the timely healing of cuts, abrasions, and lacerations. It also helps reduce scarring and may be reapplied throughout the healing process.

Flush Contaminants

Sterile eye drops or water can be used to flush contaminants from the eyes or from wounds.

FIGURE 2. Ointment is commonly used in combination with a bandage strip.

ABSORBENT AND FLEXIBLE MATERIALS

First-aid kits should include absorbent materials, bandages, elastic wrap, and adhesive.

Absorbent Materials

Absorbent materials (e.g., clean towels and gauze pads) help slow bleeding and pack wounds, especially when used in conjunction with bandages. They can be used for many purposes (e.g., wiping away sweat before attaching AED pads or cleaning dirt from a wound).

Bandages

Bandages may be wrapped in various ways, depending on the victim's injuries. Bandages may be wrapped to exert pressure on a wound or to hold injured appendages close to the body. They may be used to secure joints when elastic wrap is unavailable or to secure gauze to a wound when adhesive tape in unavailable.

Elastic Wrap

Elastic wrap holds joints in place more securely than bandages. It maintains pressure, even when the victim moves or bends the joint. Elastic wrap may be pinned in place to maintain pressure when bandages or tape are unavailable. Another benefit of elastic wrap is that it remains rigid and taut, even when it gets wet (e.g., when an ice pack melts).

Adhesive Tape

Adhesive tape sticks to itself and many other surfaces without being tied or pinned. As a result, it holds gauze in place better than bandages or elastic wrap. Tape may be substituted in most situations when bandages and elastic wrap are unavailable.

Miscellaneous Items

Many other common items are helpful to have in a first-aid kit. You can use scissors to cut tape or gauze. Safety pins hold bandages and elastic wrap together. In some situations, you may need a flashlight to illuminate a victim's injuries. Sewing needles are used to stitch cloth together to make a bandage or sling or to remove splinters. Use matches to sanitize needles and to start fires. Tweezers can help remove splinters protruding from the skin.

Additional first-aid items are cold packs to cool a burn site and hot packs to warm extremities. Kits may also include sugar packets, which can be administered to diabetic people with low blood sugar. Cotton-tipped swabs can help clear injured areas prior to cleaning and bandaging.

Kits should include items to protect responders as they administer care. Gloves protect responders from contact with blood, and a mouthpiece protects responders when performing respirations during CPR.

ADVANCED TECHNIQUES

First responders must be prepared for unexpected complications at an accident scene. They may need to seek additional professional medical assistance, especially if there are complications or multiple victims at the scene. First responders treat common injuries and illnesses with advanced first-aid techniques and treatments.

Nosebleeds

Nosebleeds often occur in children and are usually not serious. Responders should request medical assistance if the bleeding continues or is uncontrollable or if the nosebleed follows a head injury. Most nosebleeds, however, are easily treated. Instruct the victim to sit in an upright position and to lean forward while pinching the bridge of the nose.

Black Eye

A **black eye** is an injury caused by bruised or inflamed skin and soft tissue around the eye and eye socket area. Treat a black eye by applying cold packs with light pressure for 24 to 48 hours. Seek further assistance to prevent long-term eye damage if blood appears in the eye or if pain and swelling persist.

Damage to Skin

Cuts and scrapes (abrasions and damage to the skin), fishhook sticks, and splinters all require similar treatment. For cuts and scrapes, first stop the bleeding by applying pressure. Next, clean the wound, apply antibiotic ointment, and cover the wound. Change the bandage as needed.

Fishhook sticks are punctures to the skin. To treat, push the hook through the skin to expose the barb. Use wire cutters to cut off the barb, and remove the hook. Then treat the puncture wound like a cut or a scrape.

Splinters are small wooden, metal, or organic slivers caught in the skin. Most splinters may be removed with tweezers, but deeply embedded splinters may need to be removed by a doctor. If you remove a splinter, treat the area like a cut or a scrape.

FIGURE 3. Scrapes are the most common minor injury to the skin.

SHOCK

Shock is any type of acute peripheral vascular collapse in which widespread dilation of the blood vessels institutes a series of circulatory changes (e.g., when the tissues in the body do not receive enough oxygen or nutrients to function). Shock may damage organs and can be fatal. Shock is usually the result of another medical condition or injury. It is commonly associated with victims of severe trauma, burns, peritonitis, hemorrhage, allergic reactions, or heatstroke.

Classes of Shock

There are five classes of shock: hypovolemic, cardiogenic, distributive, obstructive, and endocrine.

Hypovolemic Shock

Hypovolemic shock is the most common type. It is the result of inadequate blood volume due to bleeding or hemorrhaging after an accident.

Cardiogenic Shock

Cardiogenic shock occurs when the heart cannot pump enough blood to the rest of the body. It is the result of an injury to the heart (e.g., a heart attack).

Distributive Shock

Distributive shock is caused by a dilation of blood vessels, which may be caused by anaphylactic shock after an allergic reaction, septic shock caused by infections, or neurogenic shock due to damage to the nervous system or spinal cord.

Obstructive Shock

Obstructed blood flow may result in obstructive shock. There are several causes for this type of shock. Cardiac tamponade is a condition in which fluid builds up in the pericardium and prevents blood flow to the heart. Tension pneumothorax is a condition that results from air becoming trapped between the chest wall and lung. Aortic stenosis may also hinder circulation and cause shock.

Endocrine Shock

Endocrine shock is the result of endocrine disturbances (e.g., hypothyroidism, which reduces cardiac output).

Shock Symptoms

The symptoms of shock are:

- Anxiety or restlessness
- Clammy, ashen gray skin
- Staring, lackluster eyes
- Rapid, shallow breathing
- Confusion
- Low or no urine output
- Dizziness
- Chest pain
- Unconsciousness
- Bluish lips and fingernails
- Sweating
- A rapid, weak pulse

Shock Treatment

Treat a shock victim by keeping him or her warm and comfortable. Loosen tight clothing. Check the airway, breathing, and circulation. Begin CPR if necessary. Check the rate of breathing at least every five minutes. Talk to the victim during treatment. If the victim does not have an injury to the head, leg, neck, or spine, place the person in the shock position. The **shock position** places the person on his or her back, with the legs elevated about 12 inches.

If raising the legs causes pain or potential harm, leave the person lying flat. If there is no suspected neck injury, turn the victim's head to one side.

To prevent choking, put the person in the **recovery position**, by placing the victim on his or her side with one arm under the head and the same leg extended straight down; extend the victim's other arm and leg in front, with the knee and elbow touching.

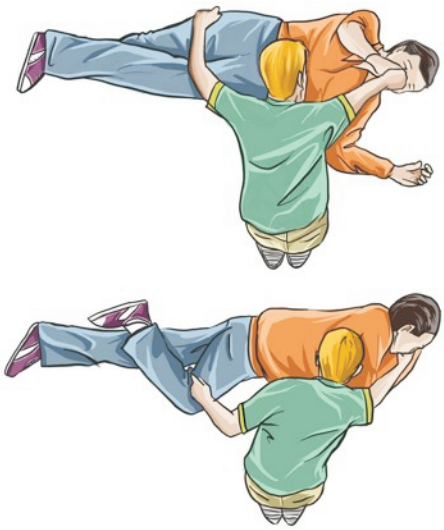

FIGURE 4. The recovery position helps prevent choking in shock victims. Place the person on his or her side.

Burns

Burns range in their severity. The degree of damage dictates the necessary response and treatment.

First-Degree Burns

First-degree burns damage only the outer layer of skin and present as red, swollen, and painful. The burns are a result of contact with heat, chemicals, electricity, sunlight, or radiation. The most common causes are scalds from hot liquids and steam, fires, and flammable liquids and gases.

Treat burns by holding the affected area under cool running water for at least five minutes. Burns can be immersed in cold water or cooled with cold compresses to reduce the swelling. After the area is cooled, cover the burn with sterile gauze bandages. Wrap the gauze loosely to avoid putting pressure on the burn. This also keeps air off the burned skin to reduce pain and to protect any blisters. Administer over-the-counter pain medications (e.g., aspirin, ibuprofen, naproxen, or acetaminophen). Do not give aspirin to children or teens. If the burn worsens or becomes infected, seek medical help.

Second-Degree Burns

Second-degree burns are severe and painful because the top layer of skin is burned away. The skin is bright red and blistered. The skin may look wet because fluids are lost through the damaged skin. These burns are usually caused by deep sunburns, exposure to flames, or contact with hot liquids. Do not remove clothing that sticks to the burn. Do not run water over the burn because it increases the risk of shock. Cover the area with a clean bandage (e.g., a gauze pad) and administer a mild pain reliever. Seek medical attention if a second-degree burn is larger than 2 to 3 inches.

Third-Degree Burns

Third-degree burns involve all layers of the skin, and the nerves are burned away. Because of this, the burns often are painless at first. The skin may be white, or it may be black or leathery. Third-degree burns are usually caused by clothing that is on fire or by contact with

flames. All third-degree burns require medical treatment. Call 911 immediately, and then check for signs of shock.

Sprains and Strains

Sprains (stretched or torn ligaments) are usually the result of falls or twists. Ankle and wrist sprains are common. Victims may report hearing a pop or tear at the time of the injury. Symptoms of a strain are pain, swelling, bruising, or the inability to move a joint.

Strains (stretched or torn muscles or tendons) are often a result of twisting or pulling tissues. They can occur suddenly or may develop over time. They often occur as a result of excessive exercise workouts (e.g., lifting weights). Symptoms are pain, muscle spasms, swelling, and trouble moving the muscle.

The acronym RICE (rest, ice, compression, and elevation) can help you remember how to treat sprains and strains. Rest the affected area. Use ice to reduce pain and swelling. Compress the area with a bandage or an elastic wrap. Elevate the area to prevent swelling. Seek medical help if the injury does not improve within two or three days.

Choking

Choking victims usually have food lodged in their throats. If the victim is conscious and responsive but unable to breathe, use the Heimlich maneuver to dislodge objects caught in the airway by applying thrusts to the victim's abdomen. Wrap your hands around the victim's stomach above the naval, and apply upward and inward thrusts. If the victim is unconscious or unresponsive, treat with CPR and call 911.

Fainting

Fainting occurs when a sudden drop in blood pressure causes an inadequate amount of blood to circulate to the brain. Symptoms are blurred and narrowed vision and lightheadedness. Treat fainting by having the victim sit with his or her head between his or her knees or by having the victim lie down with feet elevated.

ADVANCED LIFE-SAVING TECHNIQUES

First responders must be prepared to take control of an accident scene. Calm the victim and provide guidance to onlookers. Ask bystanders who are uninvolved in the rescue to step away from the scene and to call 911. Treat the most severely injured victim first. For example, treat a victim with a head wound before you treat a victim with a small cut.

Animal Bites

Bites from domestic and wild animals may transmit rabies through the animal's saliva. Treat animal bite wounds by cleaning with soap and water, applying antibacterial ointment, and ban-

daging the area. Apply pressure and seek additional help if the wound appears deep or bleeds excessively. If you suspect the animal may have rabies, contact medical help immediately.

Poison

Poison is the contact, ingestion, or inhalation of a toxic substance. It is something that makes a person sick or hurts when he or she eats, drinks, touches, or smells it. Poisons may be solids (e.g., batteries, pills, or plants), liquid (e.g., antifreeze or cough syrup), or sprays (e.g., pesticides or furniture polish). Poisons also may be invisible (e.g., carbon monoxide gas or the fumes when something is burning).

FIGURE 5. Poisonous liquid containers generally display the appropriate poison symbol.

Poisoning Symptoms

Symptoms of poisoning are:

- Vomiting
- Shortness of breath
- Sleepiness
- Confusion
- Signs (e.g., spilled pills, stains, or chemical odors) near the victim that provide clues about the type of poison involved

Poisoning Treatment

If the victim is not breathing, call 911. Call the Poison Control Center at 1-800-222-1222 if the victim swallows the wrong medicine or too much medicine. If the victim inhaled poison, take the victim to an area with fresh air before calling poison control. Remove any clothing covered with poison. Then rinse the victim's skin with running water for 15 to 20 minutes. Be ready to provide poison control with as much information as possible about the type of poison involved and the victim's symptoms.

Lacerations

Lacerations (severe cuts or tears) can result from many types of injuries, punctures, or stabbings and often result in gushing or squirting blood. Treat lacerations by applying pressure for 10 minutes and by checking to see if the wound is still bleeding. If the bleeding has not stopped, apply pressure for another 10 minutes and raise the affected area above the heart to decrease the blood flow. Seek additional medical help if the bleeding does not stop.

Contusion

A head injury or **contusion** is a bruise or wound without a laceration. It often is caused by a fall. Symptoms are head pain, bleeding, swelling, brain damage, double vision, or uncon-

BROADENING AWARENESS...

AMAZING ASPECTS: Poison Control Centers

There are 61 poison control centers in the United States. They answer calls for free, 24 hours a day, every day of the year. They handle cases involving humans and animals. According to the most recent reports from the American Association of Poison Control Centers' National Poison Data System (NPDS), more than 4.3 million calls were made to poison control centers in 2008. About 57 percent of those calls involved human exposure to poison, while 3 percent involved animal exposure. Approximately 39 percent were information calls.

NPDS reported 1,756 poisoning fatalities in 2008. The three substances most frequently involved in human exposure cases were analgesics, cosmetics/personal care products, and household cleaners. You can read more of the NPDS report at the following Web site: http://www.aapcc.org/dnn/NPDSPoisonData/AnnualReports/tabid/125/Default.aspx

sciousness. The first step in treating a contusion is to control any bleeding. Apply a bandage and an ice pack and seek medical help to avoid long-term head trauma.

Eye Injuries

Particles or chemicals in the eye may cause tearing, pain, and redness. Treat eye injuries by flushing the eye with water for 15 minutes. Lift the lower or upper eyelid to remove foreign particles. Prevent the victim from rubbing his or her eye, which may cause more damage.

Cold-Related Injuries

Frostbite and hypothermia occur in extreme cold when the body loses heat and the skin starts to lose circulation.

Frostbite

Frostbite is a condition that begins in susceptible areas and extremities (e.g., the hands, feet, and ears). The skin turns red, gray, or white and may go unnoticed because the nerves are damaged. Do not rub or massage affected areas, and do not break blisters. Warm the areas gradually with warm water.

Hypothermia

Hypothermia is an internal body temperature of 95°F or below. Symptoms are shivering, pale skin, slow breathing, and fatigue. Call for medical help and move the victim to a warm area. Remove wet or cold clothing, and apply direct heat to the victim.

Heat-Related Injuries

Heat-related injuries occur when the body is unable to cool itself fast enough. It may be a result of exposure to high temperatures, exhaustive exercise, or dehydration. Symptoms are

dizziness, headache, sweating, fatigue, and nausea. Move the person to a cool area, give the person a drink of cool water, and fan or spray water around the person. Call 911 if the victim becomes unresponsive or if the condition worsens.

Unconsciousness

Unconsciousness is a condition in which a victim is unresponsive and cannot be aroused. Call 911 and begin CPR if the victim is not breathing and has no pulse. If the victim regains consciousness, starts breathing, and has a pulse, place him or her in the recovery position.

Fractures

Fractures are broken bones caused by a major trauma. Symptoms are intense pain, swelling, a deformed appearance, and the inability to move a joint. Some fractures can be critical (e.g., injuring the neck, back, or spine). A **splint**, which is a support used to immobilize a broken bone, may be necessary to safely transport a victim. Apply ice packs to the injury, treat the victim for shock, and seek medical help. Victims with back injuries should be moved with a back board and a neck brace.

Summary:

A well-stocked first-aid kit is an essential part of preparing for an emergency situation. Make sure you know how to use each item, and check to ensure that medicines and ointments are not expired. Knowledge of first aid allows you to respond to a victim in an emergency situation.

Learning advanced techniques may help save a victim's life, if you know the symptoms and treatments for common illnesses and injuries. It is important, however, to be able to recognize when you need additional medical help for more serious conditions.

Checking Your Knowledge:

1. What are two first-aid uses for elastic wrap, bandages, and adhesive tape?
2. What are the causes of and treatment for shock?
3. What are the differences between first-, second-, and third-degree burns?
4. What are some common poisons found in the home?
5. What are the symptoms and treatment for frostbite and hypothermia?

Expanding Your Knowledge:

Think of ways to educate the general public about how to use advanced first-aid techniques to treat common illnesses and injuries. Select a specific ailment, and create an advertising campaign to inform people about the symptoms and treatments. Include details about when responders should seek additional medical help. You may want to role play a situation in which the accident may occur and offer ways to prevent the injury.

Web Links:

Burn Treatment
http://www.burnremedies.com/

First-Aid Kit Contents
http://www.redcross.org/images/pdfs/code/First_Aid_Kit_Contents.pdf

Frostbite
http://www.nlm.nih.gov/medlineplus/ency/article/000057.htm

Shock
http://www.nlm.nih.gov/medlineplus/ency/article/000039.htm