

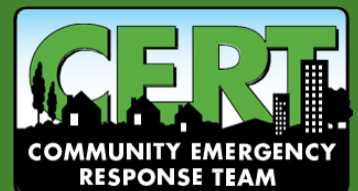


CERT Unit 3: Disaster Medical Operations – Part 1

Participant Manual



FEMA





CERT Unit 3: Disaster Medical Operations – Part 1

In this unit, you will learn about:

- **Assisting Disaster Medical Operations:** How to assist by controlling bleeding, maintaining normal body temperature, opening an airway, providing comfort to patients, and applying basic first aid care for a number of injuries.

CERT Unit 3 Table of Contents

SECTION 1: UNIT 3 OVERVIEW.....	1
Unit Objectives	1
SECTION 2: TREATING LIFE-THREATENING CONDITIONS	2
Approaching the Patient	2
Controlling Bleeding	3
Direct Pressure.....	4
Tourniquets	4
Recognizing Shock.....	5
Maintaining Body Temperature.....	5
Exercise 3.1: Controlling Bleeding	6
Opening the Airway	6
Positioning a Conscious Patient	6
Positioning an Unconscious Patient.....	7
Recovery Position	7
Jaw-thrust Maneuver	7
Exercise 3.2: Recovery Position	8
Providing Comfort.....	8
A Dialogue for Providing Comfort	8
SECTION 3: BASIC FIRST-AID CARE	9
Treating Burns.....	9
Burn Classifications	9
Guidelines for Treating Heat Burns.....	10
Guidelines for Treating Chemical Burns	10
Wound Care	11
Bandaging Wounds	11
Rules of Dressing	11
Amputations	11
Impaled Objects	12
Treating Fractures, Dislocations, Sprains, and Strains	12
Fractures	12
Treating an Open Fracture	13
Dislocations.....	13
Sprains and Strains	14

Splinting	14
Splint Illustrations	14
Exercise 3.3: Splinting	15
Treating Cold-Related Injuries	16
Hypothermia	16
Frostbite	16
Treating Heat-Related Injuries	17
Heat Exhaustion	17
Heat Stroke	17
Treatment	18
Insect Bites and Stings	18
Allergic Reactions to Bites and Stings	18
UNIT 3 SUMMARY	19
Homework Assignment	19

SECTION 1: UNIT 3 OVERVIEW

Understanding the medical operations environment in a disaster is crucial to CERT's success in assisting emergency responders. Units 3 and 4, Disaster Medical Operations Part I and II, teach life-saving steps CERT volunteers can take immediately following trauma. It also provides an overview of how emergency responders apply and organize disaster medical care in the event of a large-scale disaster. CERT volunteer's assistance with disaster medical operations can play a vital role in limiting deaths from trauma.

Units 3 and 4 do not provide an absolute way of how to manage disaster medical operations. Many localities will handle disaster medical operations differently, and there is not one concrete way to teach this material. Instead, the goal of Units 3 and 4 is to provide a high-level overview about the immediate medical interventions CERT volunteers can take to save lives, including how disaster medical operations may operate.

In a disaster, there may be more survivors than rescuers, and assistance from medical professionals may not be immediately available. While emergency medical responders are quick to arrive, any delay between injury and the initiation of care can result in death. Those nearest to someone with life-threatening injuries are in the best position to provide the first care, which should focus on the most essential actions. These essential actions include moving someone away from ongoing danger, stopping life-threatening bleeding, positioning the injured so they can breathe, keeping them warm, and providing comfort.

CERT volunteers are trained to be part of disaster medical operations and to assist in providing treatment for life-threatening conditions. Remember, the mission of CERT is to provide the greatest good for the greatest number of people. In a disaster with many survivors, time will be critical. CERT volunteers must work quickly and efficiently to help as many survivors as possible.

All CERT participants are encouraged to take basic first aid and CPR training; however, even if you have taken first aid courses you will need to understand CERT covers basic medical interventions for life-threatening (traumatic) injuries. This course does not teach CPR. To find a CPR course near you, search your local chapters of the American Red Cross and American Heart Association.

Unit Objectives

At the end of this unit, you should be able to:

1. Identify life-threatening conditions resulting from trauma including severe bleeding, low body temperature, and airway blockage;
2. Apply correct life saving techniques; and
3. Provide basic first-aid care for non-life-threatening injuries.

SECTION 2: TREATING LIFE-THREATENING CONDITIONS

Without treatment, severe bleeding and airway obstruction can quickly lead to death. The first priority of CERT volunteers assisting in disaster medical operations is to attend to these conditions by controlling bleeding and properly position a patient, so they can breathe.

Prior to treatment, it is critical to ensure that both the survivor and rescuer are in a safe environment to administer care. CERT volunteers should use their best judgement to determine if the situation is safe enough to help a survivor.

Some questions CERT volunteers can consider are:

- Do I feel safe at this spot?
- Should I leave a move to a safer location, or am I able to stay and start providing care immediately?
- If I leave, can I take anyone with me?

Whatever the decision is, the goal is to get help to the people who need it as soon as possible.

Approaching the Patient

When able, CERT volunteers should first ensure they are wearing the appropriate and proper personal protective equipment (PPE). For a detailed list of PPE, please reference Unit 1.

There are several steps to take when approaching a patient.

Step 1: If the patient is conscious, be sure he or she can see you.

Step 2: Identify yourself by giving your name and indicating the organization with which you are affiliated.

Step 3: Always request permission to treat an individual. If the individual is unconscious, it is assumed that the patient has given “implied consent,” and you may treat him or her. Ask a parent or guardian for permission to treat a child, if possible.

Step 4: Whenever possible, respect cultural differences.

Step 5: Remember, all medical patients are legally entitled to confidentiality (HIPAA). When dealing with patients, always be mindful and respectful of the privacy of their medical condition.

Controlling Bleeding

The average person has approximately five liters of blood. Severe blood loss can result in irreversible shock. This means that if you lose about half of your body's blood supply, no matter what anyone does to try to save you, death is unavoidable. You must get bleeding under control as soon as possible.

Indications of life-threatening bleeding include:

- Spurting/steady bleeding;
- Blood is pooling;
- Blood is soaking through overlying clothes;
- Blood is soaking through bandages; and
- Amputation.

Life-threatening decreases in blood pressure often are associated with a state of shock. There are typically four stages of excessive bleeding.

Stage 1: Loss of <15% of blood volume. Patient appears normal with a slightly increased heart rate.

Stage 2: Loss of 15%-30% of blood volume. Patient's body is able to compensate for the loss of blood but may appear agitated or anxious as vital signs rise.

Stage 3: Loss of 30%-40% of blood volume. Patient becomes unable to compensate and condition worsens. If left untreated will proceed to irreversible shock. Patient appears confused.

Stage 4: Loss of >40% of blood volume. Patient enters irreversible shock. Patient appears lethargic and death will occur within minutes because of overwhelming and irreversible damage to vital organs.

Table 3.1: Stages of Severe Bleeding

Stage	Blood Loss	Heart Rate	Blood Pressure	Breath Rate	Patient
I	Less than 15%	Normal (<100 bpm)	Normal	14-20	Patient appears normal
II	15%-40%	Fast (>100 bpm)	Slightly Low	20-30	Patient may feel anxious
III	30%-40%	Very Fast (>120 bpm)	Low	30-40	Patient feels confused
IV	Greater than 40%	Critical (>140 bpm)	Critical	>35	Patient feels lethargic

Types of bleeding are characterized by the speed of the blood flow.

Arterial bleeding: Arteries transport blood under high pressure. Blood coming from an artery will spurt.

Venous bleeding: Veins transport blood under low pressure. Blood coming from a vein will flow.

Capillary bleeding: Capillaries also carry blood under low pressure. Blood coming from capillaries will ooze.

Direct Pressure

The first way to try to control excessive bleeding is through applying direct pressure. To control and stop bleeding through direct pressure, follow the steps below.

Step 1: Find the source(s) of bleeding.

Step 2: If you have something to put in between the blood and your hands, use it. (e.g., gloves, a cloth, a plastic bag.)

Step 3: Apply firm, steady pressure directly on the source of the bleeding. Push hard to stop or slow bleeding—even if it is painful to the injured!

Step 4: Keep pressure applied until EMS takes over care or bleeding has stopped. If you are unsure if bleeding has stopped, continue applying pressure and wait for EMS.

Some things to keep in mind when applying direct pressure:

- Try to provide a barrier against the blood, if possible. Gloves are best.
- Do **not** use the same gloves or barrier on more than one person.
- If your barrier becomes blood soaked, replace it, but do not layer more things on top of it.
- Do **not** place bulky layers in between your hands and the source of the wound because it decreases the effectiveness of the pressure.
- Correctly applied pressure may not be comfortable for the injured. Do not let up; hold pressure until EMS arrives.

Tourniquets

If you cannot stop the bleeding by applying direct pressure and EMS professionals are delayed in responding, a tourniquet may be a viable option to save a person from bleeding to death. Tourniquets have been used effectively in combat to control bleeding in a wounded soldier's extremities (arms or legs) and are increasingly being used by uniformed responders in civilian emergencies. Tourniquets are safe and effective when applied appropriately; you are more likely to save a life than cause the loss of a limb if you use a tourniquet.

A tourniquet is a tight bandage, which when placed around a limb and tightened, cuts off the blood supply to the part of the limb beyond it.

If a commercial tourniquet is not readily available, you can try to create one yourself using something that is broad, flexible, strong, and able to be twisted, tightened, and secured, such as a webbed belt or luggage strap or material. Improvised tourniquets often fail, but you can attempt to use them as a last resort to at least slow the bleeding.

How to use a tourniquet:

Step 1: Place as high as possible on the injured limb – closest to the torso. (You can place it over clothing.)

Step 2: Pull the strap through the buckle.

Step 3: Twist the rod tightly until bleeding stops/slows significantly. (May be very painful.)

Step 4: Secure the rod.

Step 5: If bleeding does not stop, place a second tourniquet.

Step 6: Leave in place until EMS takes over care.

Image 3.1: Tourniquet



Recognizing Shock

The body will initially compensate for blood loss and mask the symptoms of shock; therefore, shock is often difficult to diagnose. It is possible — and, in fact, common — for an individual suffering from shock to be fully coherent and not complaining of pain. Pay attention to subtle clues, as failure to recognize shock will have serious consequences.

Main signs of shock:

- Rapid and shallow breathing;
- Capillary refill of greater than two seconds; and
- Failure to follow simple commands, such as “squeeze my hand.”

When a patient is in shock, avoid rough or excessive handling. It is also important to maintain the patient’s body temperature.

Maintaining Body Temperature

If necessary, place a blanket or other material under and/or over the patient to provide protection from extreme ground temperatures (hot or cold). People with very serious injuries are more susceptible to hypothermia, or abnormally low body temperature. Hypothermia increases the risk of death in survivors with serious injuries, so you must maintain normal body temperatures in patients as much as possible.

To keep a person warm, you should:

- Remove wet clothing;

- Place something between the injured person and the ground (e.g., cardboard, jacket, blanket, or anything that provides physical separation);
- Wrap the injured person with dry layers (e.g., coat, blanket, or Mylar emergency blanket); and
- Shield the injured person from the wind with your body or surrounding objects.

Hypothermia and other cold-related injuries will be discussed in greater detail later in this unit.

Exercise 3.1: Controlling Bleeding

Purpose: This exercise will provide a chance to practice using the techniques for controlling bleeding.

Instructions:

1. After breaking into pairs, identify one person to take the role of the patient and one to take the role of the rescuer.
2. Respond as if the patient has an injury on the right forearm, just below the elbow.
3. Apply a pressure bandage or tourniquet (if available).
4. Repeat the process twice.
5. Swap roles and have the new rescuer complete the above steps.

Opening the Airway

Positioning an injured patient to keep their airway open and clear is critical to saving their life. The best position for the body is one in which the chest can expand fully, and the airway is not at risk of being obstructed. In other words, the best position is one in which the tongue cannot flop back into the individual's throat and one in which blood or fluid does not end up in the lungs (aspirated), particularly in the case with someone with facial trauma.

The respiratory system includes the following components:

- Lung;
- Bronchus;
- Larynx;
- Pharynx;
- Nasal Cavity; and
- Trachea.

There are different ways to position an injured patient to keep their airway open depending on if the patient is conscious or unconscious.

Positioning a Conscious Patient

Someone who is awake will naturally assume the position that is best for them given their injuries. Despite how it looks to you, let them self-manage their airway by positioning their own body. Assist if needed.

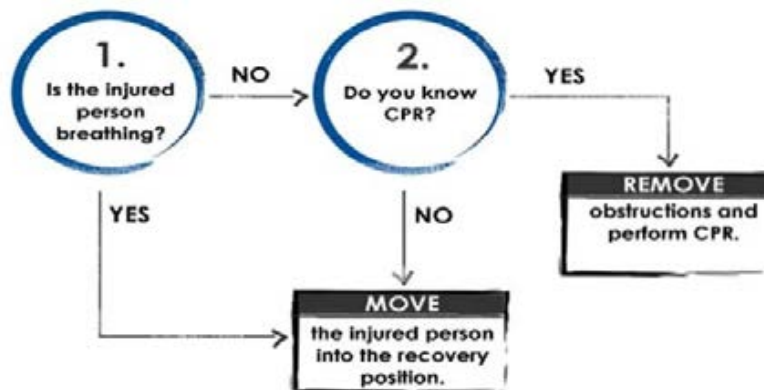
The tripod position is a natural way to open your airway – think of catching your breath after sprinting. In the tripod position, the lungs and ribcage are able to expand as fully as possible.

- **When sitting on a raised platform** (e.g., chair, bench): Legs shoulder width apart, elbows or hands on knees, and leaning forward slightly.
- **When standing:** Legs shoulder width apart, hands on knees arms straight, and leaning forward with flat back.

Positioning an Unconscious Patient

If an individual is unconscious, you can help by turning the person on his or her side so their chest can expand, tilting the head to drain fluid away from the airway. To assess an unconscious patient, consider the following diagram:

Image 3.2: Positioning an Unconscious Patient



Recovery Position

If you decide to move a patient into the recovery position, place the patient's body like this:

- Body: Laid on its side;
- Bottom Arm: Reached outward;
- Top Arm: Rest hand on bicep of bottom arm;
- Head: Rest on hand;
- Legs: Bent slightly;
- Chin: Raised forward; and
- Mouth: Pointed downward.

Although the risk is very small, it is possible that moving someone into the recovery position could cause harm to the person's spine. To prevent this:

- Try to support the head and neck when rolling them onto their side.
- Do **not** move them more than necessary.

Jaw-thrust Maneuver

When the patient is unconscious, and you suspect there is an airway obstruction, clear the airway using the jaw-thrust maneuver.

To perform this maneuver on an adult, kneel above the patient's head and:

- Put one hand on each side of the patient's head with the thumbs near the corners of the mouth pointed toward the chin, using the elbows for support.
- Slide the fingers into position under the angles of the patient's jawbone without moving the head or neck.
- Thrust the jaw upward without moving the head or neck to lift the jaw and open the airway.

Exercise 3.2: Recovery Position

Purpose: This exercise will provide a chance to practice using the techniques for moving a patient into the recovery position.

Instructions:

1. Break into pairs and have one person play the rescuer and one person play the patient.
2. Assume the unconscious injured individual is breathing.
3. Place them into the recovery position using the technique you just learned.

Providing Comfort

CERT volunteers can be of great value to injured and emotional patients simply by offering comfort and support. No special skills are needed—just a calm and reassuring presence. Unit 5 will discuss disaster psychology in greater depth; however, it is important to note that providing comfort is a part of the immediate care CERT volunteers can provide.

A Dialogue for Providing Comfort

Share names and ask basic questions, for example:

- How can I help?
- What do you need?
- What happened?

You can also provide comfort to the patient by supplying information about:

- What you currently know about what happened without speculating;
- What is being done to assist them; and
- What is going to happen next.

What can you do?

- Keep them warm.
- Offer a hand to hold.
- Maintain eye contact.
- Be patient and understanding.
- If you have to move on to provide aid to another person, let him or her know.

SECTION 3: BASIC FIRST-AID CARE

Treating Burns

The first step in treating burns is to conduct a thorough size-up. A few examples of burn-related size-up questions to ask are:

- What caused the burn?
- Is the danger still present?
- When did the burning cease?

The objectives of first aid treatment for burns are to:

- Prevent hypothermia;
- Manage pain; and
- Reduce the risk of infection.

Heat, chemicals, electrical current, or radiation may cause burns. The severity of a burn depends on the:

- Temperature of the burning agent;
- Period of time the patient was exposed;
- Area of the body that was affected;
- Size of the area burned; and
- Depth of the burn.

Burn Classifications

Depending on the severity, burns may affect all three layers of skin.

1. The epidermis, or outer layer of skin, contains nerve endings and is penetrated by hairs.
2. The dermis, or middle layer of skin, contains blood vessels, oil glands, hair follicles, and sweat glands.
3. The subcutaneous layer, or innermost layer, contains blood vessels and overlies the muscles.

Table 3.2: Burn Classification Chart

Classification	Skin Layers Affected	Signs
Superficial	<ul style="list-style-type: none"> • Epidermis 	<ul style="list-style-type: none"> • Reddened, dry skin • Pain • Swelling (possible)
Partial Thickness	<ul style="list-style-type: none"> • Epidermis • Partial destruction of dermis 	<ul style="list-style-type: none"> • Reddened, blistered skin • Wet appearance • Pain • Swelling (possible)
Full Thickness	<ul style="list-style-type: none"> • Complete destruction of epidermis and dermis 	<ul style="list-style-type: none"> • Whitened, leathery, or charred (brown or black)

Classification	Skin Layers Affected	Signs
	<ul style="list-style-type: none"> Possible subcutaneous damage (destroys all layers of skin and some or all underlying structures) 	<ul style="list-style-type: none"> Painful or relatively painless

Guidelines for Treating Heat Burns

Cool the burn:

- Remove the patient from the burning source. Put out any flames and remove smoldering clothing unless it is stuck to the skin.
- Cool skin or clothing, if they are still hot, by immersing them in cool water for not more than one minute or covering with clean compresses that have been soaked in cool water and wrung out. ***Note that rapid temperature changes can cause shock in the patient, so it is important to assess the size and severity of the burn prior to attempting to cool the skin to prevent a drop-in body temperature.***
- Cooling sources include water from the bathroom or kitchen; garden hose; and soaked towels, sheets, or other cloths.
- Do **not** use ice. Ice causes vessel constriction.

Dress the burn:

- Cover loosely with dry, sterile dressings to keep air out, reduce pain, and prevent infection.
- Wrap fingers and toes loosely and individually when treating severe burns to the hands and feet.
- Loosen clothing near the affected area. Remove jewelry if necessary, taking care to document what you removed, when, and to whom you gave it.
- Do **not** apply antiseptics, ointments, or other remedies.
- Do **not** remove shreds of tissue, break blisters, or remove adhered particles of clothing (cut burned-in clothing around the burn.)

Guidelines for Treating Chemical Burns

Unlike more traditional burns, chemical burns do not result from extreme heat, and therefore, treatment differs greatly (e.g., decontamination procedures). If you suspect a chemical burn, it is best to defer treatment to trained medical professionals.

Chemical burns are not always obvious. Consider chemical burns as a possibility if the patient’s skin is burning and there is no sign of a fire. If you suspect a chemical burn:

- Protect yourself from contact with the substance. Use your protective gear, especially goggles, mask, and gloves;
- Be sure to remove any affected clothing or jewelry;
- If the irritant is dry, gently brush away as much as possible. Always brush away from the eyes and away from the patient and yourself;
- Use lots of cool running water to flush the chemical from the skin for at least 10 minutes. The running water will dilute the chemical fast enough to prevent the injury from getting worse;

- Apply a cool, wet compress to relieve pain; and
- Cover the wound very loosely with a dry, sterile, or clean cloth so that the cloth will not stick to the wound.

Wound Care

The main treatment for wounds includes:

- Control bleeding; and
- Apply dressing and bandage.

Treatment for controlling bleeding was covered earlier in this unit. The focus of this section is on bandaging, which will help to prevent secondary infection.

Bandaging Wounds

Once you have controlled bleeding, you will need to apply a dressing and bandage to help maintain the clot and prevent infection.

There is a difference between a dressing and a bandage:

- Apply dressing directly to the wound. Whenever possible, a dressing should be sterile; and
- A bandage holds the dressing in place.

If a wound is still bleeding, the bandage should place enough pressure on the wound to help control bleeding without interfering with circulation.

Rules of Dressing

The rules of dressing are:

- If there is active bleeding (i.e., if the dressing is soaked with blood), redress over the existing dressing and maintain pressure to control bleeding; and
- In the absence of active bleeding, maintain the pressure and keep the wound bandaged until further treatment by a medical professional.

Signs of possible infection include:

- Swelling around the wound site;
- Discoloration;
- Discharge from the wound; and
- Red striations from the wound site.

Amputations

If CERT volunteers are assisting a patient with a severed body part there are a few guidelines to follow. Note that CERT volunteers should never amputate a body part. When the severed body part can be located, CERT volunteers should:

- Save tissue parts, wrapped in clean material and placed in a plastic bag, if available. Label them with the date, time, and patient's name;
- Keep the tissue parts cool, but NOT in direct contact with ice; and
- Keep the severed body part with the patient.

Impaled Objects

Sometimes, you may also encounter some patients who have foreign objects lodged in their bodies, usually as the result of flying debris. This situation is usually outside the scope of CERT training. The best course of action is to find trained medical personnel (EMS) to care for a patient with an impaled object. However, in the event that EMS is still a long way from the scene or otherwise unavailable, there are a few steps you can take to provide care.

When a foreign object impales a patient, you should:

- Immobilize the affected body part;
- Not attempt to move or remove the object, unless it is obstructing the airway;
- Try to control bleeding at the entrance wound without placing undue pressure on the foreign object;
- Clean and dress the wound making sure to stabilize the impaled object; and
- Wrap bulky dressings around the object to keep it from moving.

Treating Fractures, Dislocations, Sprains, and Strains

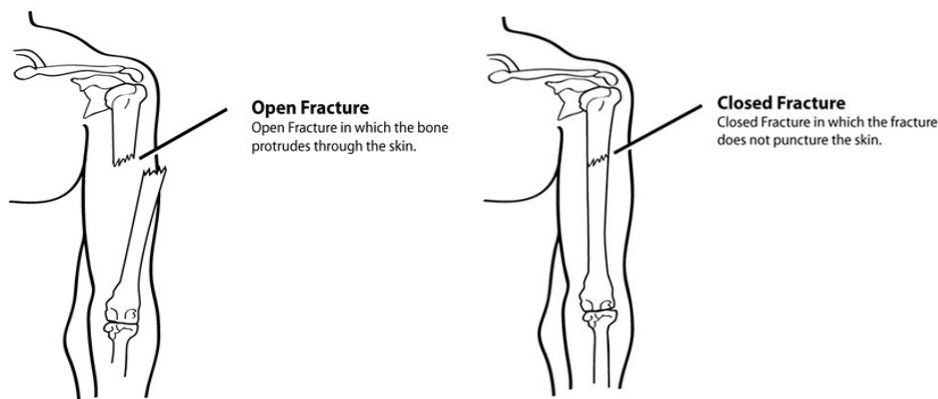
The objective when treating a suspected fracture, sprain, or strain is to immobilize the injury and the joints immediately above and below the injury site. Because it is difficult to distinguish among fractures, sprains, or strains, if uncertain of the type of injury, CERT members should treat the injury as a fracture.

Fractures

A fracture is a complete break, a chip, or a crack in a bone. There are several types of fractures.

- An **open fracture** is a broken bone with some kind of wound that allows contaminants to enter into or around the fracture site.
- A **closed fracture** is a broken bone with no associated wound. First aid treatment for closed fractures may require only splinting.

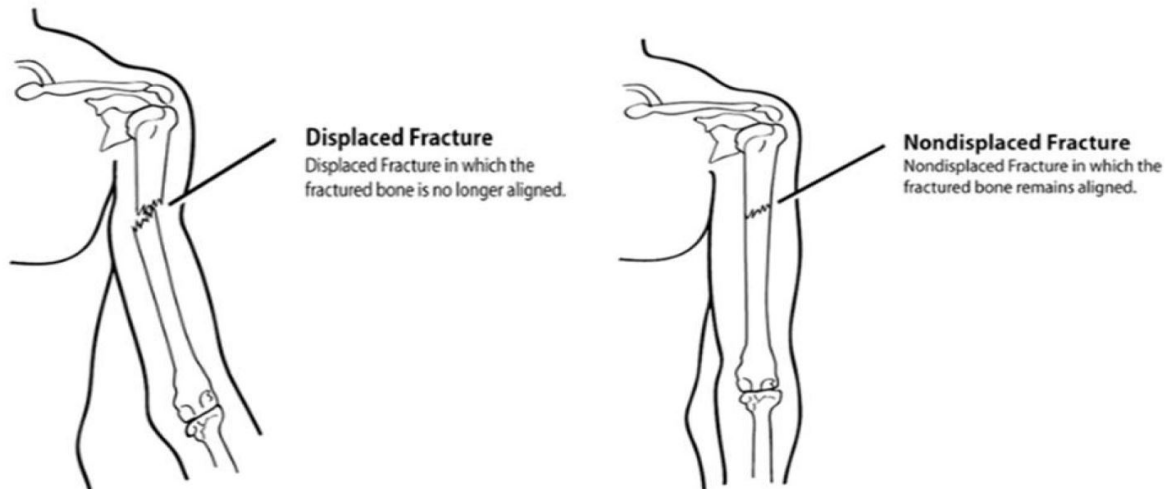
Image 3.3: Open and Closed Fractures



If the limb is angled, then it is a **displaced fracture**, which can be described by the degree of displacement of the bone fragments.

Nondisplaced fractures are difficult to identify, with the main signs being pain and swelling. You should treat a suspected fracture as a fracture until professional treatment is available.

Image 3.4: Displaced and Nondisplaced Fractures



Treating an Open Fracture

Closed fractures are generally treated with splinting, but open fractures are more dangerous because they pose a significant risk of severe bleeding and infection. Therefore, they are a higher priority and volunteers should check them more frequently.

When treating an open fracture:

- Do **not** draw the exposed bone ends back into the tissue; and
- Do **not** irrigate the wound.

You should:

- Cover the wound with a sterile dressing and apply pressure;
- Splint the fracture without disturbing the wound; and
- Place a moist 4 by 4-inch dressing over the bone end to keep it from drying out.

Dislocations

Dislocations are another common injury in emergencies. A dislocation is an injury to the ligaments around a joint that is so severe that it permits a separation of the bone from its normal position in a joint.

The signs of a dislocation are similar to those of a closed fracture, and you should treat a suspected dislocation like a closed fracture.

You should not try to relocate a suspected dislocation. You should immobilize the joint until professional medical help is available.

Sprains and Strains

A sprain involves a stretching or tearing of ligaments at a joint. Typically, stretching or extending the joint beyond its normal limits causes the sprain.

A sprain is considered a partial dislocation, although the bone either remains in place or is able to fall back into place after the injury. Whether an injury is a strain, sprain, or closed fracture, treat the injury as if it is a closed fracture.

The most common signs of a sprain are:

- Tenderness at the site of the injury;
- Swelling and/or bruising; and
- Restricted use or loss of use.

Splinting

Splinting is the most common procedure for immobilizing an injury.

Cardboard is the most common type of material used for makeshift splints, but a variety of materials can be used, including:

- **Soft materials:** Towels, blankets, or pillows, tied with bandaging materials or soft cloths; and
- **Rigid materials:** A board, metal strip, folded magazine or newspaper, or another rigid item.

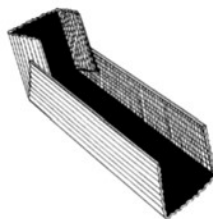
Volunteers can create anatomical splints by securing a fractured bone to an adjacent un-fractured bone. Usually, anatomical splints are reserved for fingers and toes, but, in an emergency, volunteers may splint legs together.

Use soft materials to fill the gap between the splinting material and the body part.

With this type of injury, there will be swelling. Remove restrictive clothing, shoes, and jewelry when necessary to prevent these items from acting as unintended tourniquets.

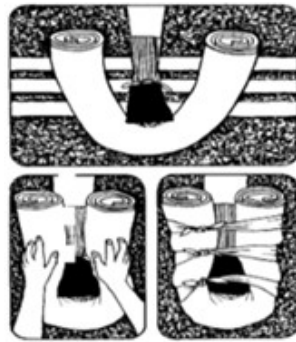
Splint Illustrations

Image 3.5: Cardboard Splint



To create a cardboard splint, turn up the edges of the cardboard to form a “mold” in which the injured limb can rest.

Image 3.5: Cardboard Splint



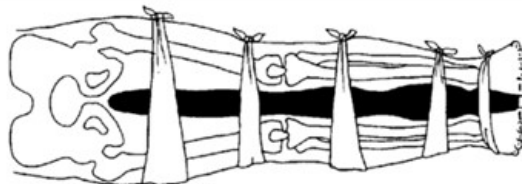
To splint using a towel, roll up the towel and wrap it around the limb, then tie it in place.

Image 3.7: Pillow Splint



For a pillow splint, wrap and tie the pillow around the limb.

Image 3.8: Anatomical Splint



An anatomical splint is one in which the injured leg is tied at intervals to the non-injured leg, using a blanket as padding between the legs.

Exercise 3.3: Splinting

Purpose: This exercise will provide you with a chance to practice splinting techniques.

Instructions:

1. Break down into groups of two. One person will play the rescuer, the other person will be the patient.
2. The rescuer will place a splint on the patient's upper arm, and then one on the patient's lower leg.
3. After several observed attempts at splinting, the rescuer and the patient will swap roles.

Treating Cold-Related Injuries

Cold-related injuries include:

- **Hypothermia**, which is a condition that occurs when the body's temperature drops below normal; and
- **Frostbite**, which occurs when extreme cold shuts down blood flow to extremities, causing tissue death.

Hypothermia

Hypothermia may be caused by exposure to cold or by trauma. The primary signs and symptoms of hypothermia are:

- A body temperature of 95° F (37° C) or lower;
- Redness or blueness of the skin; and
- Numbness accompanied by shivering.

In later stages, hypothermia will be accompanied by:

- Slurred speech;
- Unpredictable behavior; and
- Listlessness.

Because hypothermia can set in within only a few minutes, treat patients rescued from cold air or water environments first by:

- Removing wet clothing;
- Placing something between the injured person and the ground (e.g., cardboard, jacket, blanket, or anything that provides physical separation);
- Wrapping the injured person with dry layers (e.g., coat, blanket, or Mylar emergency blanket);
- Shielding the injured person from the wind with your body or surrounding objects;
- Not attempting to use massage to warm affected body parts; and
- Placing an unconscious patient in the recovery position.

Frostbite

A person's blood vessels constrict in cold weather in an effort to preserve body heat. In extreme cold, the body will further constrict blood vessels in the extremities in an effort to shunt blood toward the core organs (e.g., heart, lungs, intestines). The combination of inadequate circulation and extreme temperatures will cause tissue in these extremities to freeze, and in some cases, tissue death will result. Frostbite is most common in the nose, ears, hands, and feet.

There are several key signs and symptoms of frostbite:

- Skin discoloration (red, white, purple, black);
- Burning or tingling sensation, at times not localized to the injury site; and
- Partial or complete numbness.

Warm a patient suffering from frostbite slowly! Thawing the frozen extremity too rapidly can cause chilled blood to flow to the heart, shocking it, and potentially stopping it.

- Immerse injured area in warm (NOT hot) water, approximately 107.6° F.
- **DO NOT** allow the body part to re-freeze, as this will exacerbate the injury.
- **DO NOT** attempt to use massage to warm body parts. Frostbite results in the formation of ice crystals in the tissue; rubbing could potentially cause a great deal of damage!

Wrap affected body parts in dry, sterile dressing. Again, it is vital to complete this task carefully to reduce the likelihood of further tissue damage.

Treating Heat-Related Injuries

As a CERT volunteer, you may encounter several types of heat-related injuries during a disaster, including the following:

- **Heat cramps:** muscle spasms brought on by over-exertion in extreme heat.
- **Heat exhaustion:** occurs when an individual exercises or works in extreme heat, resulting in loss of body fluids through heavy sweating. Blood flow to the skin increases, causing blood flow to decrease to the vital organs. This results in a mild form of shock.
- **Heat stroke:** life-threatening condition when the patient's temperature control system shuts down, and body temperature can rise so high that brain damage and death may result.

Heat Exhaustion

The symptoms of heat exhaustion are:

- Cool, moist, pale, or flushed skin;
- Heavy sweating;
- Headache;
- Nausea or vomiting;
- Dizziness; and/or
- Exhaustion.

A patient suffering heat exhaustion will have a near normal body temperature. If left untreated, heat exhaustion will develop into heat stroke.

Heat Stroke

Some or all of the following symptoms characterize heat stroke:

- Hot, red skin;
- Lack of perspiration;
- Changes in consciousness; and/or
- Rapid, weak pulse and rapid, shallow breathing.

In a heat stroke patient, body temperature can be very high — as high as 105° F. If an individual suffering from heat stroke is not treated, death can result.

Treatment

Treatment is similar for both heat exhaustion and heat stroke.

1. Take the patient out of the heat and place in a cool environment.
2. Cool the body slowly with cool, wet towels or sheets. If possible, put the patient in a cool bath.
3. Have a heat stroke patient drink water, SLOWLY, at the rate of approximately half a glass of water every 15 minutes. Consuming too much water too quickly will cause nausea and vomiting in a patient of heat sickness.
4. If the patient is experiencing vomiting, cramping, or is losing consciousness, **DO NOT** administer food or drink. Alert a medical professional as soon as possible and keep a close watch on the individual until professional help is available.

Insect Bites and Stings

In a disaster environment, insect bites and stings may be more common than is typical as these creatures, like people, are under additional stress.

The specific symptoms vary depending on the type of creature, but generally, bites and stings can result in redness and itching, tingling or burning at the site of the injury, and often a welt on the skin at the site.

Treatment for insect bites and stings follows the steps below.

Step 1: Remove the stinger if still present by scraping the edge of a credit card or other stiff, straight-edged object across the stinger. Do not use tweezers; these may squeeze the venom sac and increase the amount of venom released.

Step 2: Wash the site thoroughly with soap and water.

Step 3: Place ice (wrapped in a washcloth) on the site of the sting for 10 minutes and then off for 10 minutes. Repeat this process.

Allergic Reactions to Bites and Stings

The greatest concern with any insect bite or sting is a severe allergic reaction, or anaphylaxis. Anaphylaxis occurs when an allergic reaction becomes so severe that it compromises the airway. If you suspect anaphylaxis:

- Calm the individual;
- If possible, find and help administer a patient's Epi-pen. (Many severe allergy sufferers carry one at all times); and
- **DO NOT** administer medicine aside from the Epi-pen. This includes pain relievers, allergy medicine, etc.

UNIT 3 SUMMARY

The key points from this unit are:

- CERT volunteers' ability to provide first, life-saving measures can be critical during a disaster.
- Life-saving measures CERT volunteers can take, include:
 - Controlling severe bleeding using direct pressure and/or a tourniquet;
 - Maintaining normal body temperature; and
 - Opening airways and positioning patients correctly.
- CERT volunteers can be of great value to injured and emotional patients simply by offering comfort and support. No special skills are needed — just a calm and reassuring presence.
- In addition to critical life-saving measures, CERT volunteers can also administer basic first aid and care to injured patients.
- Other injuries that are common after disasters:
 - Burns;
 - Wounds;
 - Amputations and impaled objects;
 - Fractures, dislocations, sprains, and strains;
 - Cold-related injuries;
 - Heat-related injuries; and
 - Insect bites/stings.

Homework Assignment

Read and become familiar with Unit 4: Disaster Medical Operations — Part 2 before the next session.