UNIT 3: DISASTER MEDICAL OPERATIONS

In this unit you will learn about:

- **Public Health Considerations:** How to maintain hygiene and sanitation.
- **Functions of Disaster Medical Operations:** How to conduct the four major subfunctions of disaster medical operations.
- **Disaster Medical Treatment Areas:** How to establish them and what their functions are.
- **Patient Evaluation:** How to perform a head-to-toe patient evaluation to identify and treat injuries.
- **Basic Treatment—How To:**
  - Treat burns
  - Dress and bandage wounds
  - Treat fractures, dislocations, sprains, and strains
  - Apply splints to hands, arms, and legs
  - Treat heat and cold emergencies
  - Control nasal bleeding

Revised 01.09.07 M. Hovey

UNIT 3: DISASTER MEDICAL OPERATIONS

INTRODUCTION AND UNIT OVERVIEW

This unit will cover:

- Public health concerns related to sanitation, hygiene, and water purification.
- Organization of disaster medical operations.
- Establishing treatment areas.
- Conducting head-to-toe assessments.
- Treating wounds, fractures, sprains, and other common injuries.

OBJECTIVES

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

- Take appropriate sanitation measures to protect the public health.
- Perform head-to-toe patient assessments.
- Establish a treatment area.
- Apply splints to suspected fractures and sprains, and employ basic treatments for other wounds.

PUBLIC HEALTH CONSIDERATIONS

When disaster victims are sheltered together for treatment, public health becomes a concern. Measures must be taken, both by CERT members and programmatically, to avoid the spread of disease.

The primary public health measures include:

- Maintaining proper hygiene.
- Maintaining proper sanitation.
- Purifying water (if necessary).

MAINTAINING HYGIENE

Maintenance of proper hygiene is critical even under makeshift conditions.

Some steps that individual workers can take to maintain hygiene are to:

- Wash hands frequently, using soap and water, before and after giving care. Hand washing should be thorough (at least 12 to 15 seconds) with an antibacterial scrub if possible.
- Wear latex gloves at all times. Change or disinfect gloves after examining and/or treating each patient. As explained earlier, under field conditions, workers can use rubber gloves that are sterilized between treating victims using bleach and water (1 part bleach to 10 parts water).
- Wear a mask and goggles. If possible, wear a mask that is rated "N95."
- Keep dressings sterile. Do not remove the overwrap from dressings and bandages until use. After opening, use the entire dressing or bandage, if possible.
- Avoid contact with body fluids. Thoroughly wash areas that come in contact with body fluids with soap and water or diluted bleach as soon as possible.

MAINTAINING SANITATION

Poor sanitation is also a major cause of illness, disease, and death.

Note: During initial Triage at a multiple patient event, there will not be time to change gloves. If time allows, a bucket of bleach and water can be used to rinse hands between patients.

PUBLIC HEALTH CONSIDERATIONS (CONTINUED)

CERT medical operations personnel can maintain sanitary conditions by:

- Controlling the disposal of bacterial sources (e.g., latex gloves, dressings, etc.).
- Putting waste products in plastic bags, tying off the bags, and marking them as medical waste. Keep medical waste separate from other trash, and dispose of it as hazardous waste.
- Disposing of human waste - properly marked bags kept in a secure area until they can be picked up by the city. Do not flush toilets until you have been advised that sewer lines are not damaged.

Cleaning Up a Blood Spill

- Clean up as soon as possible after the spill occurs
- Use disposable gloves and other PPE
- Wipe up the spill with paper towels or other absorbent material
- After the area has been wiped up, flood the area with a solution of ¼ cup liquid chlorine bleach to 1 gallon of fresh water and allow it to stand for at least 20 minutes
- Dispose of contaminated material used to clean up the spill in a labeled biohazard container.

WATER PURIFICATION

Potable water supplies are often in short supply or are not available in a disaster. Purify water for drinking, cooking, and medical use by heating it to a rolling boil for 3-5 minutes, or by using water purification tablets or unscented liquid bleach. (16 drops per gallon of water, wait 30 minutes) Use only regular household liquid bleach that contains 5.25 percent sodium hypochlorite. Do not use scented bleaches, colorsafe bleaches or bleaches with added cleaners.

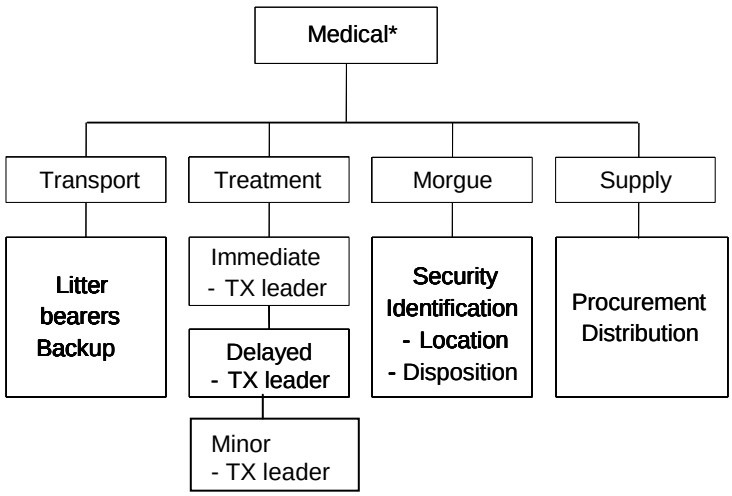
Rescuers should not put anything on wounds other than purified water. The use of other solutions (e.g., hydrogen peroxide) on wounds must be the decision of trained medical personnel.

CERT members must use non-latex gloves, goggles, and a mask during all medical operations, and they must cover all open wounds as a way of preventing the spread of disease.

FUNCTIONS OF DISASTER MEDICAL OPERATIONS

There are four major subfunctions of disaster medical operations:

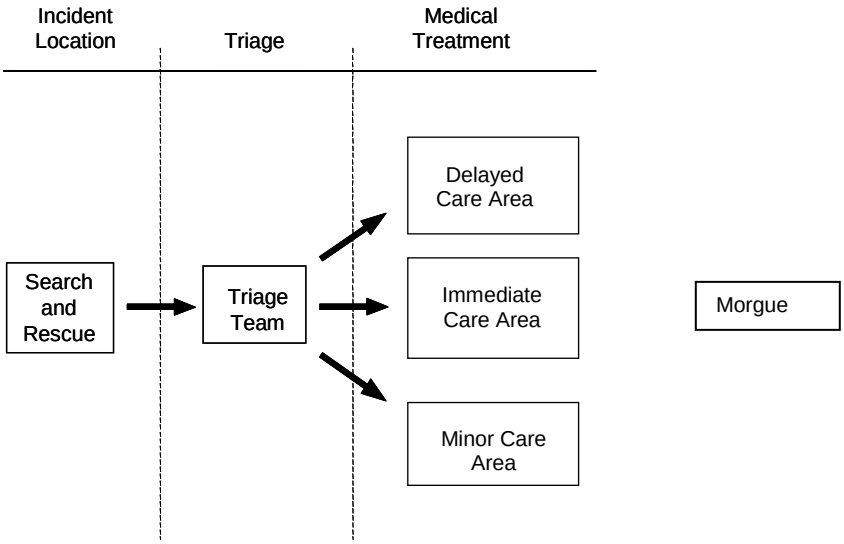
- Triage: The initial assessment and sorting of victims for treatment based on the severity of their injuries
- Treatment: The area in which disaster medical services are provided to victims
- Transport: The movement of victims from the triage area to the treatment area. If professional help will be delayed, for efficiency of operations, victims can be transported to the treatment area by CERT members
- Morgue: The temporary holding area for victims who have died as a result of their injuries



Disaster Medical Operations Organization

Disaster Medical Operations Organization, showing the subfunctions of disaster medical operations: Transport, Treatment, Morgue, and Supply.

FUNCTIONS OF DISASTER MEDICAL OPERATIONS (CONTINUED)



Patient Flowchart

Patient Flowchart, which shows how the patients are rescued, triaged, and sent to the medical treatment areas according to the extent of their injuries ("I," "D," "M" or "∀" Dead").

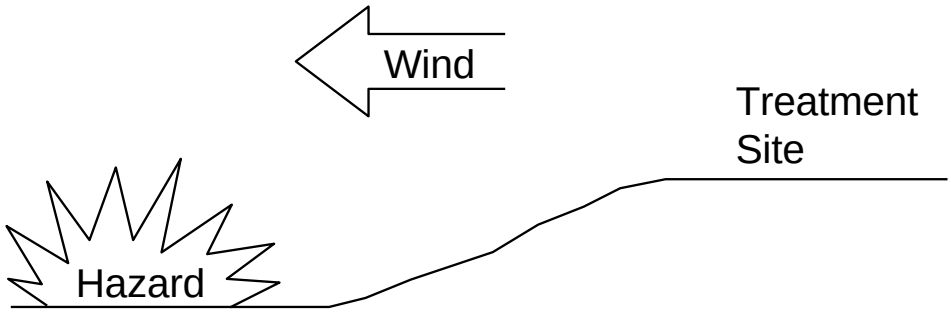
ESTABLISHING TREATMENT AREAS

Because time is critical during an emergency, CERT medical operations personnel will need to select a site and set up a treatment area as soon as injured victims are confirmed.

The treatment area is the location where the most advanced medical care possible will be given to victims.

The site selected should be:

- In a safe area, free of hazards and debris.
- Close to, but upwind and uphill from, the hazard zone(s).
- Accessible by transportation vehicles (ambulances, trucks, helicopters, etc.).
- Expandable.



Treatment Area Site Selection

Treatment Area Site Selection, uphill and upwind from hazard.

TREATMENT AREA LAYOUT

The treatment area must be protected and clearly delineated using a ground cover or tarp, and signs should identify the subdivisions of the area:

- "I" for Immediate care
- "D" for Delayed care
- "M" for Minor care
- "DEAD or ~~"V"~~ for the morgue

The "I" and "D" divisions should be relatively close to each other to allow:

- Verbal communication between workers in the two areas.
- Shared access to medical supplies (which should be cached in a central location).
- Easy transfer of patients whose status has changed.

The "M" division will require less medical treatment but observation and reassessment is still necessary.

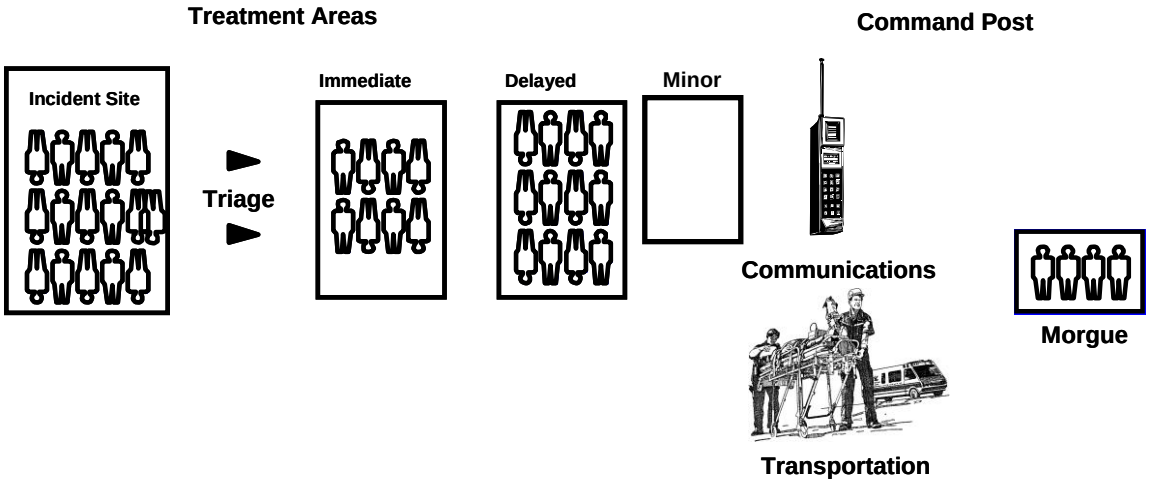
Handout #1
Treatment Area Layout

Handout #2
Morgue Area Layout

ESTABLISHING TREATMENT AREAS (CONTINUED)

A clearly marked treatment area will help in transporting victims to the correct location.

Patients in the treatment area should be positioned in a head-to-toe configuration, with two to three feet between victims.



Treatment Area Layout

Treatment Area Layout, showing the organization for the incident site, triage, communications, transportation, and morgue.

This system will provide:

- Effective use of space.
- Effective use of available personnel. (As a worker finishes one head-to-toe assessment, he or she turns around and finds the head of the next patient.)

TREATMENT AREA ORGANIZATION

The CERT team must assign leaders to maintain control in each of the medical treatment areas. These leaders will:

- Ensure orderly victim placement.
- Direct assistants to conduct head-to-toe assessments.

ESTABLISHING TREATMENT AREAS (CONTINUED)

Thoroughly document victims in the treatment area, including:

- Available identifying information.
- Description (age, sex, body build, height, weight).
- Clothing.
- Injuries.
- Treatment.
- Transfer location.

TREATMENT AREA PLANNING

Remember to plan before disaster strikes, including:

- Roles of personnel assigned to the treatment area.
- Availability of setup equipment needed, such as ground covers/tarps and signs for identifying divisions (immediate, delayed, minor and morgue).

Take part in practice exercises so that you can develop a good operational plan and practice rapid treatment area setup.

MOVING DECEASED PATIENTS

Only more deceased patients:
If the location is dangerous
If you need to get to another patient for treatment
If the Coroner is unavailable and it is necessary to create one secure area
To limit mental trauma - exposure of others

Before moving, attempt to document the date, time and location of the body. Collect personal belongings in a ziplock bag. Take a digital photo of the body, in place.

MORGUE

The site selected should be:

- In a safe area, free of hazards and debris.
- Isolated from people and animals.
- Accessible by transportation vehicles.
- In a shady/cool location.

Must have 24 hour security!

LIFTS AND CARRIES

There are two basic types of removal:

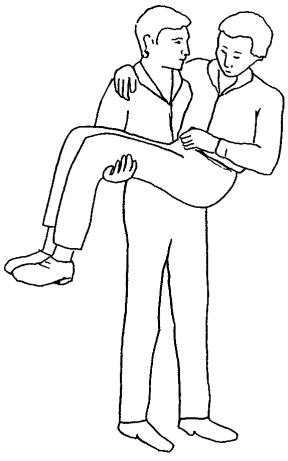
- Self-removal or assist
- Lifts and drags

It is usually best to allow an ambulatory victim to extricate himself or herself. However, sometimes ambulatory victims are not as strong and uninjured as they think that they are. When victims become free from entrapment, they may need assistance to exit the structure.

If safety and time permit, you should not use lifts and drags to remove victims when closed-head or spinal injury is suspected. In such cases, the spine must be stabilized using a backboard. Doors, tables, and similar materials can be used as improvised backboards. The backboard must be able to carry the person, and proper lifting techniques must be used. When moving victims, rescuers must use teamwork and communication, and keep the victim's spine in a straight line. Remember, rescuer safety and the condition of the building will dictate the approach.

There are several types of lifts and carries. For example, if the rescuer is physically able and the victim is small, he or she may use the one-person arm carry to lift and carry the victim by:

- Reaching around the victim's back and under the knees.
- Lifting the victim while keeping the rescuer's back straight and lifting with the legs.



One-Person Arm Carry

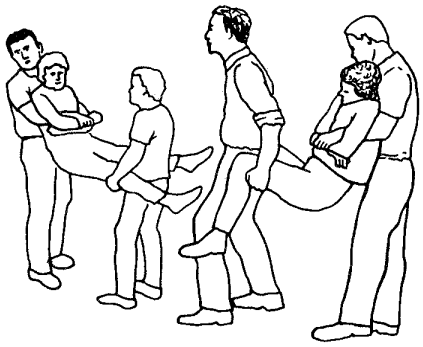
One-Person Arm Carry, which shows the rescuer holding the victim around the victim's back and under the knees.

Note: Consider the size of the victim and the distance he or she needs to be carried before using this carry.

LIFTS AND CARRIES (CONTINUED)

Victim removal is easier when multiple rescuers are available. With two rescuers, a victim may be removed using a two-person lift.

- Rescuer 1: Squat at the victim's head and grasp the victim from behind around the midsection. Reach under the arms and grasp the victim's forearms.
- Rescuer 2: Squat between the victim's knees, facing either toward or away from the victim. Grasp the outside of the victim's legs at the knees.
- Both rescuers: Rise to a standing position, keeping backs straight and lifting with the legs. Walk the victim to safety.



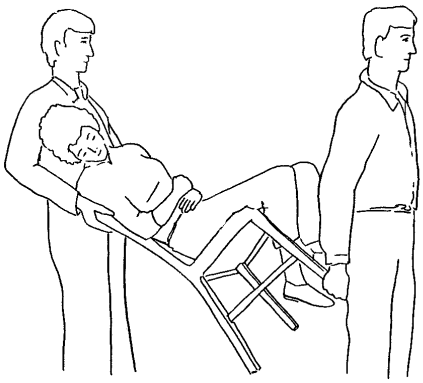
Two-Person Carry

Two-Person Carry in which rescuer 1 squats at the victim's head and grasps the victim from behind at the midsection. Rescuer 2 squats between the victim's knees, grasping the outside of the knees. Both rescuers rise to a standing position.

LIFTS AND CARRIES (CONTINUED)

Two rescuers can also remove a victim by seating him or her on a chair:

- Rescuer 1: Facing the back of the chair, grasp the back uprights.
- Rescuer 2: Facing away from the victim, reach back and grasp the two front legs of the chair.
- Both rescuers: Tilt the chair back, lift, and walk out.



Chair Carry

Chair Carry in which the victim is placed in a chair and tilted backward as rescuers lift the victim. This carry requires two rescuers.

LIFTS AND CARRIES (CONTINUED)

You can use the blanket carry for victims who cannot be removed by other means. The blanket carry requires at least six rescuers to ensure stability for the victim, and one rescuer must be designated the lead person:

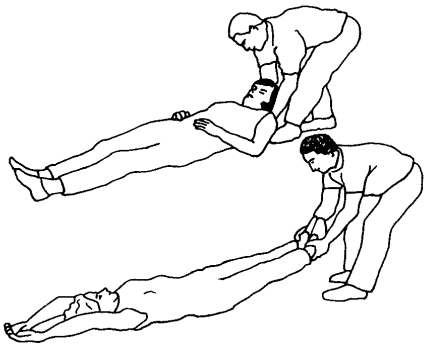
- Step 1: Lay a blanket next to the victim.
- Step 2: Tuck the blanket under the victim, and roll the victim into the center of the blanket.
- Step 3: With three rescuers squatting on each side and grasping a "handle," the lead person checks the team for even weight distribution and correct lifting position.
- Step 4: The lead person calls out, "Ready to lift on the count of three: One, two, three, *lift.*"
- Step 5: The team lifts and stands in unison— keeping the victim level—and carries the victim feet first.

The team must also lower the victim together, using the following steps:

- Step 1: The lead person calls out, "Ready to lower on the count of three: One, two, three, *lower.*"
- Step 2: The team lowers the victim in unison, exercising caution to keep the victim level.

A variety of materials—such as blankets—can be used as improvised stretchers.

Rescuers can also drag a victim out of a confined area by grasping either under the arms or by the feet and pulling across the floor. However, unless there is no other way to remove the victim and the victim's removal is time critical, you should not use this drag when debris may cause additional injury.



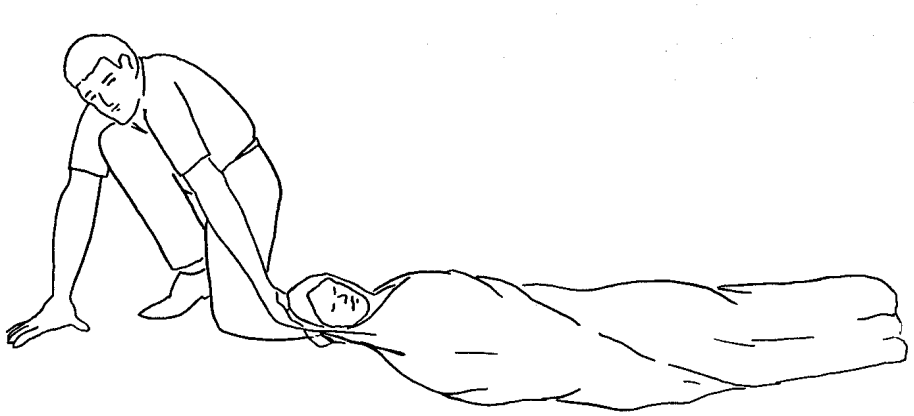
Correct Drag Techniques

Correct Drag Technique, showing the rescuer grasping the victim by either the feet or shoulders and dragging him or her clear of the hazard.

LIFTS AND CARRIES (CONTINUED)

When necessary, one rescuer can use the blanket drag by following these steps:

- Step 1: Wrap the victim in a blanket.
- Step 2: Squat down and grasp an edge of the blanket.
- Step 3: Drag the victim across the floor.



Blanket Drag

Blanket Drag, showing the victim wrapped in a blanket with the rescuer squatting at the victim's head. The rescuer grasps the blanket behind the victim's head and drags him or her clear of the hazard.

EXERCISE: REMOVING VICTIMS

Only move patients when…

- The surroundings pose immediate danger
- You can do so without causing further harm
- You must transport the patient to get more advanced care

CONDUCTING HEAD-TO-TOE ASSESSMENT

The first steps that you will take when working with a victim will be to conduct a triage and rapid treatment. After all victims in an area have been triaged CERT members will begin a thorough head-to-toe assessment of the victim's condition.

During triage, you looked for "the killers." ***See Unit 3, Triage, for more information on "killers"***

- Airway obstruction.
- Excessive bleeding.
- Signs of shock.

A head-to-toe assessment goes beyond the "killers" to try to gain more information to determine the nature of the victim's injury. During a head-to-toe assessment, look for the following:

- Bruising.
- Swelling.
- Severe pain.
- Disfigurement.

A head-to-toe assessment can be done in place in a lightly damaged building. If the building is moderately damaged, the victim should be moved to a safe zone or to the treatment area for the head-to-toe assessment.

The objectives of a head-to-toe assessment are to:

- Determine, as clearly as possible, the extent of injuries.
- Determine what type of treatment is needed.
- Document injuries.

Note: Always be aware of your surroundings and the possible "mechanism of injury" to the victim. Remember, your safety is #1.

OBTAINING CONSENT

Before giving care to a conscious patient, you must first get consent. To get consent:

- State your name
- Tell the patient you are trained in First Aid
- Ask the patient if you can help
- Explain what you think may be wrong
- Explain what you plan to do

If the patient does not give consent, do not give care.

A patient who is unconscious, confused, or seriously ill may not be able to grant consent. In such cases, consent is implied. Implied consent means that the victim would agree to the care if he or she could.

CONDUCTING HEAD-TO-TOE ASSESSMENT (CONTINUED)

Always wear safety equipment when conducting head-to-toe assessments.

Head-to-toe assessments should be:

- Conducted on all victims, even those who seem all right. Everyone gets a tag.
- Verbal (if the patient is able to speak).
- Hands-on.

Conduct head-to-toe assessments systematically, checking body parts from the top to the bottom for continuity of bones and soft tissue injuries in the following order:

1. Head, eyes, ears, nose, mouth
2. Neck
3. Shoulders
4. Chest
5. Abdomen
6. Pelvis
7. Arms, hands
8. Legs, feet
9. Back

First recheck RPMs to identify any life-threatening changes to condition.

***Let the victim know what you're doing at all times*.**
"I'm checking your neck for any injuries…etc"

Never move a body part! Ask the victim if they can move it.

Completing the assessment in the same way every time will make the procedure quicker and more accurate.

Check your own hands for patient bleeding as you complete the head-to-toe assessment.

Perform an entire assessment before beginning any treatment. Also, treat all unconscious victims as if they have a spinal injury. *Minimize patient movement.*

Whenever possible, you should ask the person about any injuries, pain, bleeding, or other symptoms. If the victim is conscious, CERT members should always ask permission to conduct the assessment. The victim has the right to refuse treatment. Then:

- Pay careful attention.
- Look, listen, and feel for anything unusual.

CONDUCTING HEAD-TO-TOE ASSESSMENT (CONTINUED)

CLOSED-HEAD, NECK, AND SPINAL INJURIES

When conducting head-to-toe assessments, rescuers may come across victims who have or may have suffered closed-head, neck, or spinal injuries.

The main objective when CERT members encounter suspected injuries to the head or spine is to do no harm. You should minimize movement of the head and spine, while treating any other life-threatening conditions.

The signs of a closed-head, neck, or spinal injury most often include:

- Change in consciousness.
- Inability to move one or more body parts.
- Severe pain or pressure in the head, neck, or back.
- Tingling or numbness in extremities.
- Difficulty breathing or seeing.
- Heavy bleeding, bruising, or deformity of the head or spine.
- Blood or fluid in the nose or ears.
- Bruising behind the ear.
- "Raccoon" eyes (bruising around eyes).
- "Uneven" pupils.
- Seizures.
- Nausea or vomiting.
- Victim found under collapsed building material or heavy debris.

DOCUMENTATION OF VICTIMS

Thoroughly document victims in treatment area, including:

- Available identifying information
- Description of victim: age, sex, height, weight, hair, eyes
- Clothing
- Injuries
- Treatment
- Transfer location

CONDUCTING HEAD-TO-TOE ASSESSMENT (CONTINUED)

If the victim is exhibiting any of these signs, he or she should be treated as having a closed-head, neck, or spinal injury.

Keep the spine in a straight line when doing the head-to-toe assessment.

In an extreme emergency, ideal equipment is rarely available, so the CERT members may need to be creative by:

- Looking for materials that can be used as a backboard—a door, desktop, building materials—anything that might be available.
- Looking for items that can be used to stabilize the head on the board—towels, draperies, or sandbags—by tucking them snugly on either side of the head to immobilize it.

EXERCISE: CONDUCTING HEAD-TO-TOE ASSESSMENT

Purpose: This exercise allows you to practice conducting head-to-toe assessments.

Instructions: Follow the steps below to complete this exercise:

1. Work in two-person teams of victim and rescuer.
2. Victims should lie on the floor on their backs and close their eyes.
3. The rescuer should conduct a head-to-toe assessment on the victim following the procedure demonstrated earlier.
4. After the rescuer has made at least two observed head-to-toe assessments, the victim and rescuer should change roles.

Handout #3
Head to Toe Assessment

TREATING BURNS

The objectives of first aid treatment for burns are to:

- Cool the burned area.
- Cover with a sterile cloth to reduce the risk of infection (by keeping fluids in and germs out).

Burns may be caused by heat, chemicals, electrical current, and radiation. The severity of a burn depends on the:

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

BURN CLASSIFICATIONS

The skin has three layers:

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

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

Burns are classified as first, second, or third degree depending on their severity.

TREATING BURNS (CONTINUED)

Burn Classifications

Classification	Skin Layers Affected	Signs
1st Degree	▪ Epidermis (superficial)	▪ Reddened, dry skin ▪ Pain ▪ Swelling (possible)
2nd Degree	▪ Epidermis ▪ Partial destruction of dermis	▪ Reddened, blistered skin ▪ Wet appearance ▪ Pain ▪ Swelling (possible)
3rd Degree (Full Thickness Burns)	▪ Complete destruction of epidermis and dermis ▪ Possible subcutaneous damage (destroys all layers of skin and some or all underlying structures)	▪ Whitened, leathery, or charred (brown or black) ▪ Painful or relatively painless

Guidelines for treating burns include:

- Removing the victim from the burning source. Put out any flames and remove smoldering clothing unless it is stuck to the skin.
- Cooling skin or clothing, if they are still hot, by immersing them in cool water for <u>not more</u> than 1 minute or covering with clean compresses that have been wrung out in cool water. Cooling sources include water from the bathroom or kitchen; garden hose; and soaked towels, sheets, or other cloths. **Treat all victims of third-degree burns for shock.**
- Covering loosely with dry, sterile dressings to keep air out and prevent infection.
- Elevating burned extremities higher than the heart.
- <u>Do not</u> use ice. Ice causes vessel constriction.
- <u>Do not</u> apply antiseptics, ointments, or other remedies.
- <u>Do not</u> remove shreds of tissue, break blisters, or remove adhered particles of clothing. (Cut burned-in clothing around the burn.)

Infants, young children, and older persons, and persons with severe burns, are more susceptible to hypothermia. Therefore, rescuers should use caution when applying cool dressings on such persons. A rule of thumb is do not cool more than 15 percent of the body surface area (the size of one arm) at once, to prevent hypothermia.

TREATING BURNS (CONTINUED)

Chemical Burns

- Protect yourself
- Flush with water for 15 minutes

Electrical Burns

- Make sure power is off before touching patient
- Check ABC's
- Treat any electrical burn as a wound and look for entrance and exit wounds

WOUND CARE

This section will focus on cleaning and bandaging to control infection:

The objectives of treatment for wounds are to:

- Control bleeding.
- Prevent secondary infection.

The focus of this section is on cleaning and bandaging, which will help to control infection.

Wounds should be cleaned by irrigating with water, flushing with a mild concentration of soap and water, then irrigating with water again.

You should not scrub the wound. A bulb syringe is useful for irrigating wounds. In a disaster, a turkey baster may also be used.

When the wound is thoroughly cleaned, you will need to apply a dressing and bandage to help keep it clean and control bleeding.

Note: The difference between a dressing and a bandage is that:

- A dressing is applied directly to the wound
- A bandage holds the dressing or body parts in place

WOUND CARE (CONTINUED)

Follow these rules:

1. In the absence of active bleeding, dressings must be removed and the wound must be flushed and checked for signs of infection at least every 4 to 6 hours.

   Signs of possible infection include:

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

2. Control bleeding with **Direct Pressure** - The bandage should place enough pressure on the wound to help control bleeding without interfering with circulation. If still bleeding, **Elevate** the wound and if still bleeding, use a **Pressure Point.**

3. If there is still active bleeding (i.e., if the dressing is soaked with blood), redress over the existing dressing and maintain pressure and elevation to control bleeding.

4. Check for feeling, warmth and color.

AMPUTATIONS

The main treatments for an amputation (the traumatic severing of a limb or other body part) are to:

- Control bleeding.
- Treat shock.

IMPALED OBJECTS

You may also encounter some victims who have foreign objects lodged in their bodies—usually as the result of flying debris during the disaster.

When a foreign object is impaled in a patient's body, 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. Wrap bulky dressings around the object to keep it from moving.

TREATING FRACTURES, DISLOCATIONS, SPRAINS, AND STRAINS

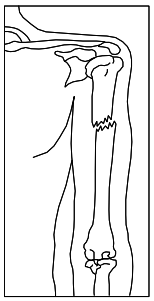
The objective when treating a suspected fracture, sprain, or strain is to immobilize the injury and the joints immediately above and below the injury site.

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:

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



Closed Fracture

Closed Fracture in which the fracture does not puncture the skin.

Open Fracture

Open Fracture in which the bone protrudes through the skin.

Open fractures are more dangerous because of the risk of severe bleeding and infection. Therefore, they are a higher priority and need to be checked more frequently.

When treating an open fracture:

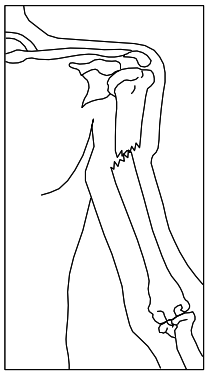
- Do not draw the exposed bone ends back into the tissue.
- Do not irrigate the wound.

You should:

- Cover the wound with a sterile dressing.
- Splint the fracture without disturbing the wound.
- Place a moist 4" x 4" dressing over the bone end to keep it from drying out.

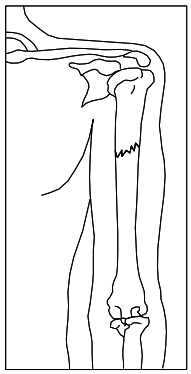
Displaced fractures may be described by the degree of displacement of the bone fragments. If the limb is angled, then there is a displaced fracture.

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



Displaced Fracture

Displaced fracture in which the fractured bone is no longer aligned.



Nondisplaced Fracture

Nondisplaced fracture, in which the fractured bone remains aligned.

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 fracture, and a suspected dislocation should be treated like a fracture.

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

SPRAINS AND STRAINS

A sprain involves a stretching or tearing of ligaments at a joint and is usually caused by stretching or extending the joint beyond its normal limits.

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.

The most common signs of a sprain are:

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

The signs of a sprain are similar to those of a nondisplaced fracture. Therefore, do not try to treat the injury other than by immobilization and elevation.

A strain involves a stretching and/or tearing of muscles or tendons. Strains most often involve the muscles in the neck, back, thigh, or calf.

In some cases, strains may be difficult to distinguish from sprains or fractures. When uncertain whether an injury is a strain, sprain, or fracture, treat the injury as if it is a fracture.

TREATING FRACTURES, DISLOCATIONS, SPRAINS, AND STRAINS (CONTINUED)

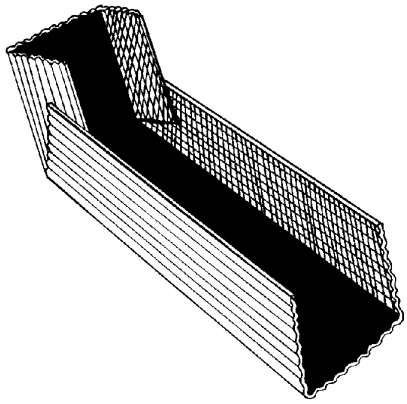
SPLINTING

Splinting is the most common procedure for immobilizing an injury.

Cardboard is the material typically 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.
- Rigid materials. A board, metal strip, folded magazine or newspaper, or other rigid item.

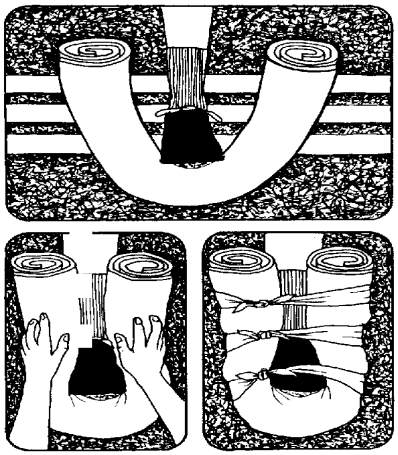
Anatomical splints may also be created by securing a fractured bone to an adjacent unfractured bone. Anatomical splints are usually reserved for fingers and toes but, in an emergency, legs may also be splinted together.



Cardboard Splint

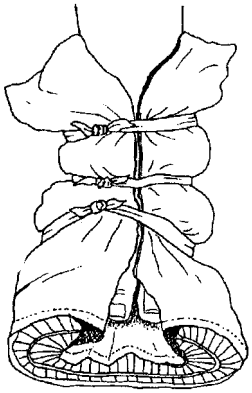
Cardboard Splint in which the edges of the cardboard are turned up to form a "mold" in which the injured limb can rest.

SPLINTING (CONTINUED)



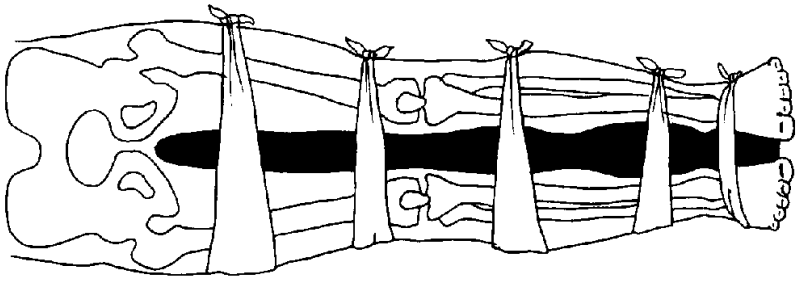
Splinting Using a Towel

Splinting using a towel, in which the towel is rolled up and wrapped around the limb, then tied in place.



Pillow Splint

Pillow splint, in which the pillow is wrapped around the limb and tied.



Splinting Using A Blanket

Splinting using a blanket in which the victim's legs are immobilized by tying blankets at intervals from mid-thigh to feet.

The guidelines for splinting include:

1. Support the injured area above and below the site of the injury, including the joints.
2. If possible, splint the injury in the position that you find it.
3. Don't try to realign bones or joints.
4. After splinting, check for proper circulation (warmth, feeling, and color).
5. Immobilize above and below the injury.

SPLINTING (CONTINUED)

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

EXERCISE: SPLINTING

Purpose: This exercise allows you to practice the procedures for splinting.

Instructions: Follow the steps below to complete this exercise:

1. Working in two-person teams, one person will be the victim and one person will be the rescuer.
2. Victims should lie on the floor on their backs or sit in a chair.
3. The rescuer should apply a splint on the victim's upper arm using the procedure demonstrated earlier. Then, the rescuer should apply a splint to the victim's lower leg.
4. The victim and the rescuer should change roles.

NASAL INJURIES

Bleeding from the nose can be caused by:

- Blunt force to the nose.
- Skull fracture.
- Nontrauma-related conditions such as sinus infections, high blood pressure, and bleeding disorders.

A large blood loss from a nosebleed can lead to shock. Actual blood loss may not be evident because the victim will swallow some amount of blood.

Victims who have swallowed large amounts of blood may become nauseated and vomit.

The methods for controlling nasal bleeding include:

- Pinching the nostrils together.
- Putting pressure on the upper lip just under the nose.

NASAL INJURIES (CONTINUED)

While treating for nosebleeds, you should:

- Have the victim sit with the head slightly forward so that blood trickling down the throat will not be breathed into the lungs. Do not put the head back.
- Ensure that the victim's airway remains open.
- Keep the victim quiet. Anxiety will increase blood flow.

SIGNALS	CARE
HEAT CRAMPS PAINFUL MUSCLE SPASMS, USUALLY IN THE LEGS AND ABDOMEN	• MOVE TO A COOL PLACE • GIVE COOL WATER TO DRINK • HAVE PATIENT LIGHTLY STRETCH MUSCLE AND GENTLY MASSAGE THE AREA
HEAT EXHAUSTION Cool, moist, pale, flushed, or ashen skin Sweating profusely Headache, nausea, dizziness Weakness, exhaustion	• Move patient to a cooler area • Loosen or remove clothing • Circulate air while applying water with a cloth or sponge • If the patient is conscious, give small amounts of cool water to drink – no alcohol
HEAT STROKE Change in level of consciousness High body temperature Red, hot skin that can either be dry or moist Rapid or weak pulse Rapid or shallow breathing	• Same care as heat exhaustion. • Place in a cool bath as long as the patient is conscious and can be continuously observed • Alternatively, moisten the skin with lukewarm water and use a fan to blow cool air across the skin. • Can be life threatening.
HYPOTHERMIA Shivering Slow, irregular pulse Numbness Glassy Stare Apathy or impaired judgement Loss of muscle control, no shivering, or loss of consciousness (late stages)	• Gently move patient to warm place • Check ABCs and care for shock • Remove wet clothing and cover the patient with blankets and plastic sheeting to hold in body heat from shivering • Give sips of warm, sweet drinks – do not give alcohol or caffeine. • Warm the patient slowly and handle carefully • Keep head and neck covered • Do not allow patient to walk around, even if they appear fully recovered
FROSTBITE Loss of feeling and sensation in the extremity Discolored, waxy skin appearance Severe frostbite may include blisters and blue skin	• Same as hypothermia and… • Soak frostbitten area in warm water • Cover with dry, sterile dressings – do not rub anything on the area • Do not rewarm a frostbitten part if there is danger of it refreezing • Do not give alcohol or caffeine

UNIT SUMMARY

To safeguard public health, take measures to maintain proper hygiene and sanitation, and purify water if necessary. All public health measures should be planned in advance and practiced during exercises.

Disaster medical operations includes four subfunctions:

- Triage
- Treatment
- Transport
- Morgue

Head-to-toe assessments should be verbal and hands-on. Always conduct head-to-toe assessments in the same way—beginning with the head and moving toward the feet. If injuries to the head, neck, or spine are suspected, the main objective is to not cause additional injury. Use in-line stabilization and a backboard if the victim must be moved.

Treatment areas must be established as soon as casualties are confirmed. Treatment areas should be:

- In a safe area that is close to, but uphill and upwind from, the hazard area.
- Accessible by transportation vehicles.
- Expandable.

Burns are classified as first, second, or third degree depending on severity and the depth of skin layers involved. Treatment for burns involves removing the source of the burn, cooling the burn, and covering it. For third-degree burns, always treat for shock.

The main first aid treatment for wounds consists of:

- Controlling bleeding.
- Cleaning.
- Dressing and bandaging.

  In the absence of active bleeding, dressings must be removed and the wound checked for infection at least every 4 to 6 hours. If there is active bleeding, a new dressing should be placed <u>over</u> the existing dressing.

UNIT SUMMARY (CONTINUED)

Fractures, sprains, and strains may have similar signs, and diagnosis may not be possible under disaster conditions. Treat suspected fractures, sprains, and strains by immobilizing the affected area using a splint.

HOMEWORK ASSIGNMENT

Read and familiarize yourself with Unit 4: Safety Assessment and Light Search & Rescue before the next session.

Prepare your own first aid kit.