Chapter IV
Disaster Medical Operations—Part 2

In this chapter you will learn about:

- **Patient evaluation:** How to perform a head-to-toe patient evaluation in order to identify and treat injuries.
- **Disaster medical treatment areas:** How to establish them and what their functions are.
- **Basic first aid treatment:** How to
  - Treat burns.
  - Dress and bandage wounds.
  - Treat fractures, sprains, and strains.
  - Apply splints to hands, arms, and legs.
  - Treat hypothermia and frostbite.
- **Public health considerations:** Public health concerns related to sanitation, hygiene, and water purification.

Introduction

Overview

Chapter III described triage—the evaluation and prioritizing of patients into treatment groups and the provision of immediate life-saving measures. From triage, live patients are transported to the immediate and delayed treatment areas as needed, and the dead are transported to the morgue. As patients are brought to the treatment areas, medical operations personnel:

- Perform additional triage as needed.
- Give patients a thorough head-to-toe assessment to determine the extent of injuries.
- Render all possible first aid until professional care can be obtained.
- Take appropriate sanitation measures.

This chapter will introduce disaster medical operations and describe the factors involved in establishing treatment areas. It will also present the processes to follow for completing a head-to-toe assessment and train you to provide immediate treatment for:

- Burns.
- Open wounds.
- Fractures, sprains, and strains.
- Hypothermia.
- Frostbite.

Overview (Continued)

This chapter will also describe public health considerations surrounding disaster medical operations and provide basic information that you will need to prepare for medical operations in a disaster. Your instructor may present additional information during the classroom session. Be sure to take careful notes.

Organization Of Disaster Medical Operations

Within medical operations, there are five major subfunctions:

- Triage
- Transport
- Treatment
- Morgue
- Supply

These functions are shown in the figure on the next page.

Organization Of Disaster Medical Operations *(Continued)*

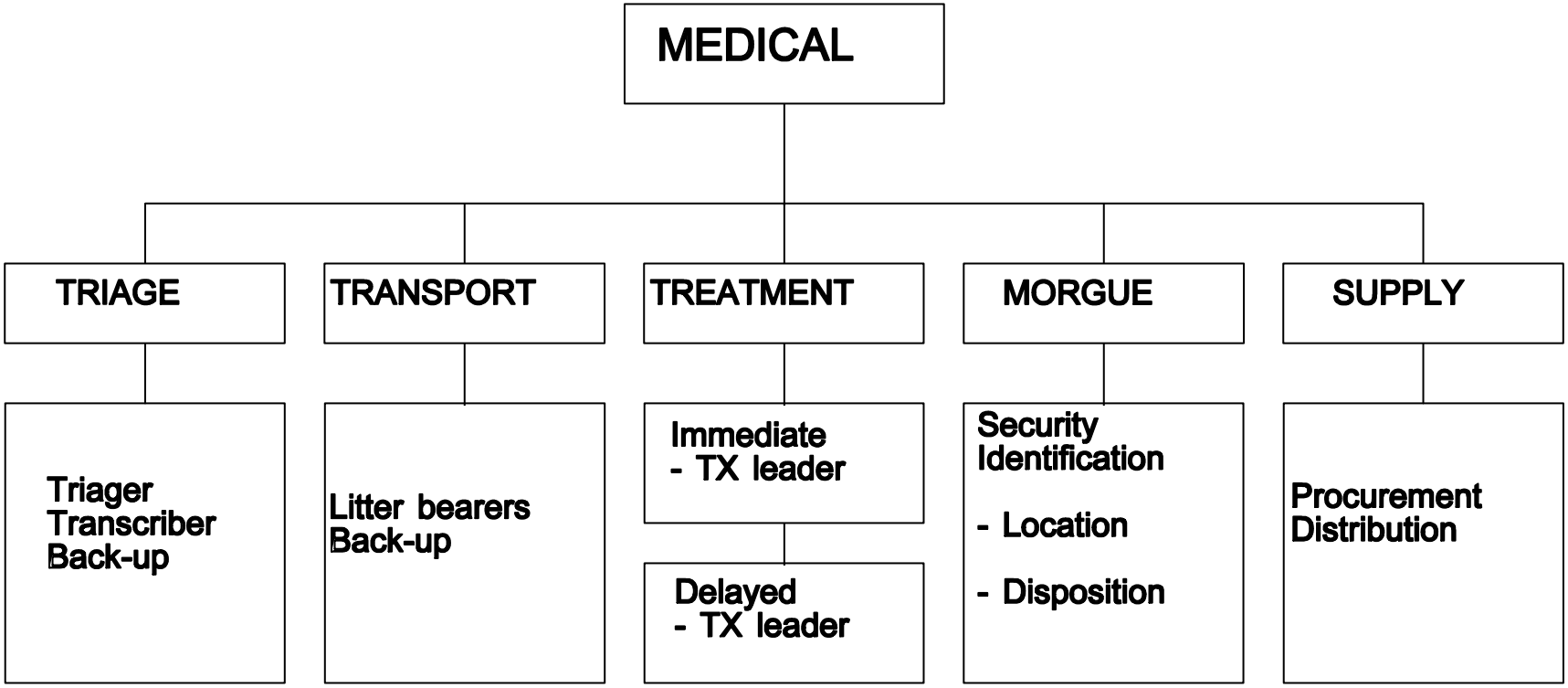

Figure IV-1. Disaster Medical Operations Organization

Major Causes Of Injury

Injury, or *trauma*, can result from the body being hit by flying debris or collapsing building materials, being thrown against an object, or falling onto a surface. The energy of impact may cause damage to soft tissues, bones, organs, and other body structures.

Injuries may include the following:

- *Penetrating injury* (an injury that breaks the skin at a small point of contact). Penetrating injuries include lacerations (open wounds) and impaled objects.

- *Blunt trauma* (damage to deeper tissues by impact over a larger area). Blunt trauma can cause internal bleeding, organ rupture, bruising, fractures, brain injury, and other injuries.

- *Crushing injury* (force applied to the body over a relatively long period of time).

As a worker in disaster medical operations, you may give first aid to victims with a wide range of injuries.

Conducting Head-To-Toe Assessments

Objective

Among the first steps when a patient is receiving medical treatment is to conduct a triage for airway, bleeding, and shock. Then do a size-up—that is, conduct a thorough head-to-toe assessment. This can be done in place in a lightly damaged building. If the building is more heavily damaged, the victim should be moved to a safe zone for the head-to-toe assessment. The objectives of this assessment are to determine, as clearly as possible, the extent of injuries and the type of treatment that is needed, and to document the injuries.

This section will provide you with the basic information you need to conduct head-to-toe assessments under emergency conditions.

Assessment Procedures

Head-to-toe assessments must be performed for all victims, even those that are awake. Assessments should be both *verbal* (if the patient is able to speak) and *hands-on.* Whenever possible, ask the person about any injuries, pain, bleeding, or other symptoms that he or she is aware of. If the victim is conscious, ask permission to conduct the assessment. Pay careful attention. Look, listen, and feel for anything unusual.

> All rescuers in medical operations must wear a helmet, goggles, mask, latex gloves, and boots.

Assessment Procedures *(Continued)*

When conducting triage during a disaster, it is essential to document the number of victims in each category of triage (immediate, delayed, and dead) and where these victims are located in the treatment area. See the figure below for an example of this kind of documentation. Such a record can be given to professional responders when they arrive so that no time is lost getting immediate care to those who need it.

STATUS	LOCATION			
	A	B	C	D
I	|	|||	Ø	|
D	Ø	||	𝍸	|||
Dead	|||	𝍸 ||	|	Ø

Figure IV-2. Sample Triage Documentation

What To Check

Perform the assessment systematically (always in the same order), checking body parts from the top to the bottom. Always assess the victim by examining the:

1. Head
2. Neck
3. Shoulders
4. Chest
5. Arms
6. Abdomen
7. Pelvis
8. Legs
9. Back

Completing your assessment in the same way every time will allow you to complete your assessment more quickly and accurately. Always perform an entire assessment before beginning any treatment. Treat victims as if they have a spinal injury until you are certain they do not.

What To Look For

As you conduct your assessment, look for anything that might indicate an injury. The most common injuries include lacerations, fractures, and bruises, but anything out of the ordinary might indicate an injury. Look especially for:

- How the person may have gotten hurt (the mechanism of injury), to help determine injuries.
- Signs of shock.
- Airway obstructions.
- Labored, shallow, or otherwise difficult breathing.

What To Look For (Continued)

- Excessive bleeding.
- Bruising.
- Swelling.
- Severe pain.
- Disfigurement.

Be sure to check your own hands during the assessment for any signs of patient bleeding.

Once you have completed your assessment, *provide immediate treatment* for victims tagged "I." During treatment, reclassify victims if necessary. Also, as you record medical information, try to document who the person is.

> Complete your head-to-toe assessment. Do not become fixed on one injury.

Closed Head, Neck, And Spinal Injuries

If, during a head-to-toe assessment, you encounter a victim with a suspected closed head, neck, or spinal injury, your main objective is to *do no harm*. Minimize movement of the head and spine, while treating any other life-threatening conditions (airway, bleeding, or shock).

Injuries to the head, neck, and spine often occur when victims fall, are hit by flying debris, or have objects fall on them—situations that are common when there is structural collapse. Closed head, neck, and spinal injuries may be life-threatening. They can also cause paralysis, affect speech and memory, and disable the victim in other ways. Any time a head, neck, or spinal injury is even suspected, it should be treated as a head, neck, or spine injury. Talk to the victim to determine symptoms, and to keep the victim calm and still. All unconscious trauma patients should be suspected as having a head, neck, or spinal injury.

Symptoms

If the rescuer is not in immediate danger, check the victim for signs of injury to the head, neck, or spine before moving the victim. The main signs of closed head, neck, or spinal injury are:

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

Stabilizing Head, Neck, Or Spinal Injuries

The process for immobilizing head, neck, or spinal injuries is called in-line stabilization. In-line stabilization means to *keep the spine in a straight line.* Ideally, this is done by carefully fitting a cervical collar on the victim's neck, placing the victim on a back board, and securing the victim so movement is impossible. However, in a disaster situation, ideal equipment and materials are seldom available. Spinal immobilization devices are not intended to be used for lifting or carrying.

Stabilizing Head, Neck, Or Spinal Injuries (Continued)

Head, neck, and spine treatment under emergency conditions may require creativity and will most likely involve:

- *Looking for materials that can be used as a backboard.* For example, a door, table, desktop, or building materials such as sheetrock or lumber can be used as a backboard when necessary.

> When moving victims, use teamwork, communication, proper lifting technique, and in-line stabilization.

- *Looking for items that can be used to stabilize the head on the board.* A towel, blanket, clothing, drapery material, or sandbags tucked snugly on either side of the head will immobilize it in an emergency.

Your instructor will demonstrate in-line stabilization during class. Whenever possible, defer closed head, neck, and spinal injuries to trained emergency medical personnel. Remember the goal when you suspect such injuries: *do no harm*.

The next sections of this chapter will provide you with the information you will need to establish a treatment area, provide treatment, and make the patient more comfortable (through splinting, applying dressings, or providing other treatment). You will also have the opportunity to practice some of the most common treatment techniques during class.

Establishing Treatment Areas

Because time is critical after a disaster, CERT medical operations personnel will need to select a site and set up a treatment area as soon as casualties 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, such as ambulances, trucks, and helicopters.
- Able to grow.

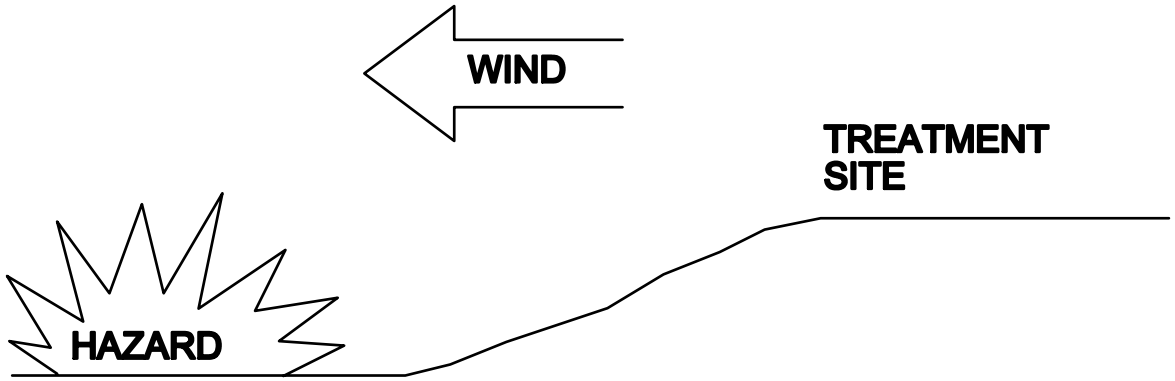

Figure IV-3. Treatment Area Site Selection

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, "DEAD" 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 morgue site should be secure, and away from and not visible from the medical treatment areas.

Patients in the treatment area should be positioned in a head-to-toe configuration, with two to three feet between victims. This system will provide effective use of space, and 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.)

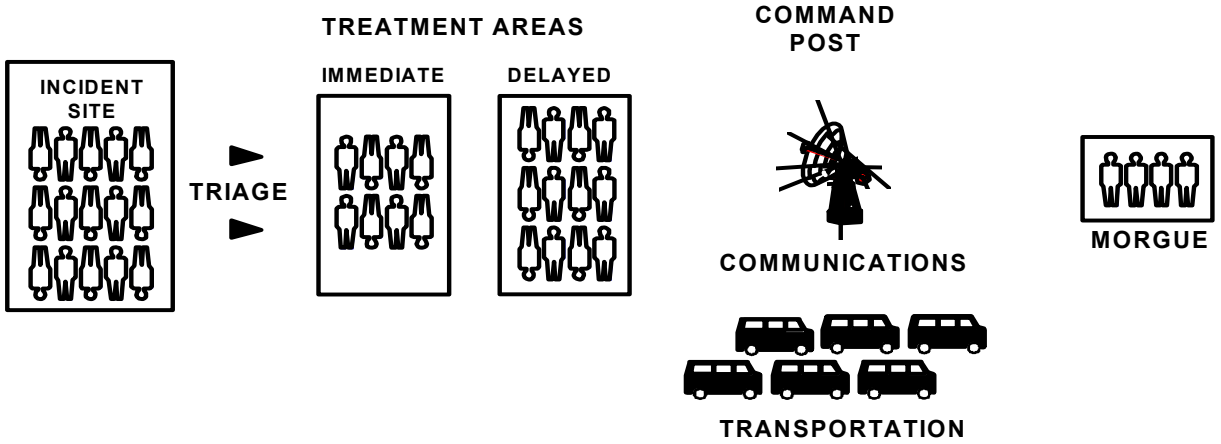

Figure IV-4. Treatment Area Layout

Treatment Area Organization

The CERT team must assign division leaders to maintain control in each of the medical treatment areas. Among the tasks of these division leaders will be ensuring orderly victim placement, and directing assistants to conduct head-to-toe assessments.

Thorough documentation of victims in the treatment area is essential. Documentation should include:

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

Treatment Area Planning

Clearly, advance planning for how treatment areas will be established is crucial. Before disaster strikes, team members should consider:

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

Treating Burns

The objectives of first aid treatment for burns are to stop the burning and cover to reduce pain and infection.

Burns may be caused by heat, chemicals, electrical current, and radiation. The severity of a burn depends on many factors—the temperature of the burning agent, the period of time that the victim was exposed, the area of the body that is burned, how much area is affected, the age of the victim, and the burn depth.

Burn Classifications

The skin contains three layers:

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

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

The critical areas of the body for burns are the:

- Face
- Hands
- Feet
- Genitalia

Burn Classifications (Continued)

Burns are classified as first-, second-, or third-degree depending on their severity. Burn classifications, the skin layers affected, and signs are shown in the table below.

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, and charred (brown or black) • Painful or relatively painless

Table IV-1. Burn Classifications

Burn Treatment

First aid treatment for burn victims involves removing the source of the burn, cooling the burn, and covering it. Guidelines for treating burns include:

- Remove the victim from the burn source. Put out any flames and remove smoldering clothing.
- If skin or clothing is still hot, cool them by immersing in cool water for not longer than 1 minute or covering with clean compresses that have been wrung out in cool water. Possible cooling sources include water from the bathroom or kitchen; garden hose; and soaked towels, sheets, or other cloths. Use clean water. For third-degree burns, do not apply water except to put out flames. Treat all victims of third-degree burns for shock.
- Cover loosely with dry, sterile dressings to keep air out, reduce pain, and prevent infection.
- Elevate burned extremities higher than the heart.

When treating burns:

- Do not use ice, which can cause hypothermia.
- 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.)

With younger people, older people, and people with severe burns, use caution when applying cool dressings. These people are susceptible to hypothermia. A rule of thumb is do not cool more than fifteen percent of body surface area (the size of one arm) at once, to prevent hypothermia.

Wound Care

The objectives of first aid treatment for wounds are to control bleeding and prevent secondary infection. Methods for controlling bleeding were described in Chapter III of this Participant Handbook. Cleaning and bandaging help to prevent infection.

Clean the wound by irrigating with water, flushing with a mild concentration of soap and water, then irrigating with water again. *Do not scrub.* A bulb syringe or hypodermic syringe is useful for irrigating wounds.

After thoroughly cleaning the wound, you will need to apply a dressing and bandage to help to keep the wound clean.

A *dressing* is applied directly to the wound. A *bandage* is used to hold the dressing in place.

To dress and bandage the wound, clean the wound area as described above, place a sterile dressing directly over the wound, and apply a bandage to hold it in place. If the wound is still bleeding, the bandage should place enough pressure on the wound to help control bleeding without interfering with circulation. Check for color, warmth, and sensation to determine if the bandage is too tight. If capillary refill is slow, loosen the dressing.

Your instructor will demonstrate how to apply dressings and bandages.

Use the following rules for dressings and bandages:

- In the absence of active bleeding, dressings must be removed and the wound 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 (pus) from the wound.
  - Red striations from the wound site.

- If there is active bleeding (the dressing is soaked with blood), redress over the existing dressing and maintain pressure and elevation.

Amputations

In an emergency situation, an amputation is the traumatic severing of a limb or other body part. To treat the victim, control bleeding, watch for signs of shock, and treat for shock as necessary.

If a part of the body is severed and can be found, save tissue parts, wrapped in clean material, in a plastic bag if available, and keep the tissue parts cool. Keep the severed part with the victim.

Impaled Objects

You may encounter some victims who have foreign objects lodged in their bodies—usually as the result of flying debris during the disaster event. When a foreign object is impaled in a patient's body:

- Immobilize the affected body part.
- Do *not* attempt to move or remove the object unless the object is occluding 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, Sprains, And Strains

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

Because there are several different types of injuries, however, and your actions depend in part on the type of injury encountered, this section will describe the different types of injuries possible next.

Fractures

A fracture is a complete break, a chip, or a crack in a bone. Fractures are classified as:

- *Closed.* A broken bone with no associated wound. First aid treatment for a closed fracture may require only splinting.

- *Open.* A broken bone with some kind of wound that allows contaminants to enter into or around the fracture site. Open fractures are more dangerous because of the risk of severe bleeding and infection. They are, therefore, a higher priority injury and should be checked more frequently. When treating an open fracture:

  - Do *not* draw the exposed bone ends back into the tissue.
  - Cover the wound with a sterile dressing. Do not irrigate the wound.
  - Cover the exposed bone with a moist 4 x 4 bandage to keep it from drying out.
  - Splint the fracture without disturbing the wound.

Fractures *(Continued)*

Examples of open and closed fractures are shown in Figures IV-5 and IV-6.

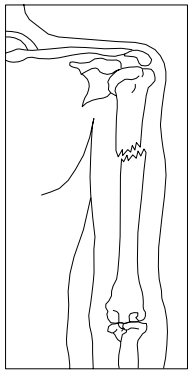

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Figure IV-5. Closed Fracture

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Figure IV-6. Open Fracture

Closed fractures may be described by the degree of displacement of the bone fragments. If the limb is angled, then there is a *displaced fracture*. A displaced fracture may be detected by seeing and feeling the deformity. A *nondisplaced fracture* is difficult to identify without x-rays. The main indicators are usually pain and swelling, which could also indicate a strain or sprain. Therefore, treat areas where there is pain and swelling as a suspected fracture until professional diagnosis and care can be obtained.

Fractures (Continued)

Examples of displaced and nondisplaced fractures are shown in Figures IV-7 and IV-8.

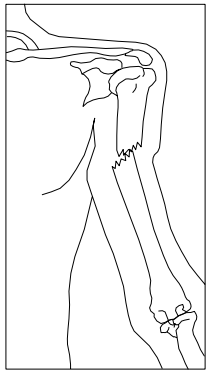

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Figure IV-7. Displaced Fracture

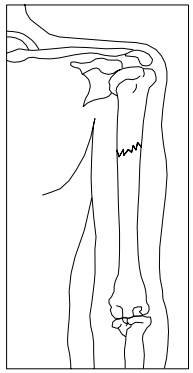

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Figure IV-8. Nondisplaced Fracture

Dislocations

Another common injury in emergency situations is a dislocation. A dislocation is an injury to the ligaments around a joint that is so severe that it results in separation of the bone from its normal position at a joint. Once dislocated, the bones lock in their new position. The joints most commonly dislocated are fingers, shoulders, elbows, hips, and ankles. The signs of a dislocation are similar to those of a fracture, so treat a suspected dislocation like a fracture.

When a dislocation is a possibility, do *not* attempt to relocate the joint. Immobilize the joint until it can be treated by trained medical staff.

Sprains And Strains

A *sprain* is the stretching or tearing of ligaments at a joint and is usually caused by stretching or extending the joint beyond its normal range of motion. A sprain is considered a partial dislocation, although (unlike a full dislocation) the bone is able to fall back into place after the injury. The joints most easily sprained are the ankle, knee, wrist, and fingers. Common symptoms of sprains include:

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

Because the signs of a sprain are similar to those of a nondisplaced fracture, do *not* attempt to treat the injury beyond immobilization and elevation.

A *strain* is the stretching and tearing of muscles or tendons. Strains most often involve the muscles in the neck, back, thigh, or calf. In some cases, a strain is indistinguishable from a sprain or fracture without x-rays or other, more sophisticated diagnostic methods. In these cases, treat the injury as a fracture.

> **CAUTION:** Remove shoes, tight clothing, and jewelry from an injured area to prevent these items from acting as a tourniquet if swelling occurs.

Nasal Injuries

Bleeding from the nose may be caused by:

- Facial injuries (blunt force to the nose).
- Skull fracture.
- Non-trauma-related conditions such as sinus infections, high blood pressure, and bleeding disorders.

A large blood loss from a nosebleed can lead to shock. The actual blood loss may not be evident because some blood goes down the throat and is swallowed. A victim who swallows a lot of blood may become nauseated and vomit. Vomitus that is inhaled into the lungs will result in serious complications.

To control nosebleeds caused by injuries to the nose:

- Control bleeding by:
  - Pinching the nostrils together.
  - Putting pressure on the upper lip just under the nose (e.g., place rolled gauze between the upper lip and gum and press against it with the fingers).
- 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.
- Be sure the victim's airway remains open.
- Keep the victim quiet. Anxiety will increase blood flow.

Splinting

Splinting is the most common method for immobilization in emergency conditions. A variety of materials may be used for first aid splinting. Typically, cardboard is used until professional care can be obtained. (See Figure IV-9 on the following page.) However, other materials that may be available can also be used, including:

- *Soft Materials.* A towel can be rolled into a thick tube shape, placed around the injury, and secured in several places with bandaging materials or cloth strips. (See Figure IV-10 on page IV-28.) A blanket can be used in the same way. A pillow can be wrapped around an injured limb and secured in several places with bandaging materials or cloth strips. (See Figure IV-11 on page IV-28.)

- *Rigid Materials.* A board, metal strip, folded magazine or newspaper, or other rigid item may be used to support the injured part and secured with bandaging materials or strips of cloth. (See Figure IV-12 on page IV-29.)

- *Anatomical Splint.* A fractured bone can be secured to an adjacent unfractured bone by binding the two together in several places (for example, two fingers or two legs).

Your instructor will demonstrate proper techniques for splinting hands and fingers, the humerus (upper arm), and the tibia or fibula (lower leg).

Guidelines for placing and checking splints include:

- *Support* the injured area above and below the site of the injury, including the joints.

- If possible, splint the injury in the position you find it.

- Don't try to realign bones or joints.

- After splinting, check for proper circulation (warmth, feeling, color).

Splinting
(Continued)

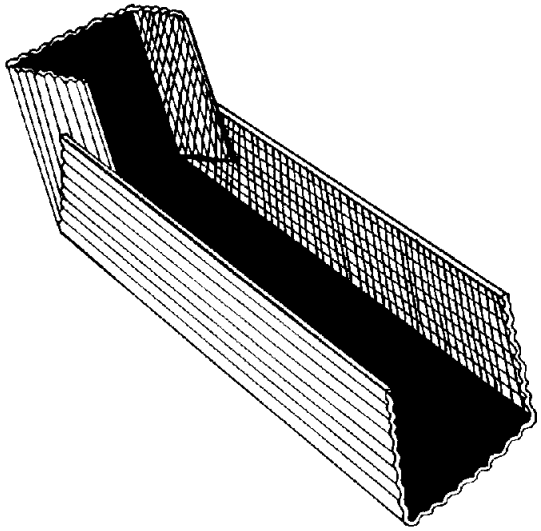

Figure IV-9. Cardboard Splint

Splinting
(Continued)

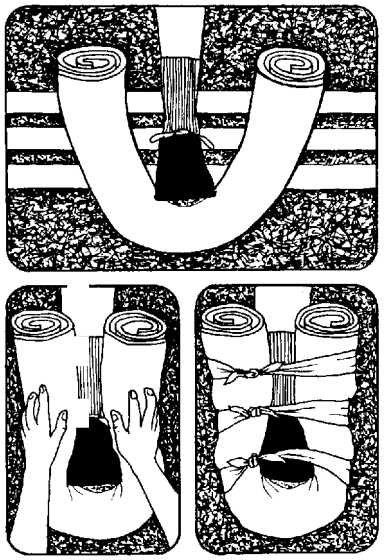

Figure IV-10. Splinting Using A Towel

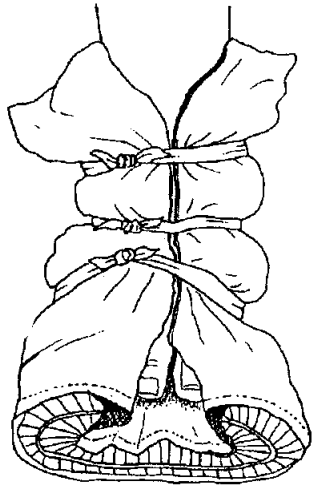

Figure IV-11. Splinting Using A Pillow

Splinting
(Continued)

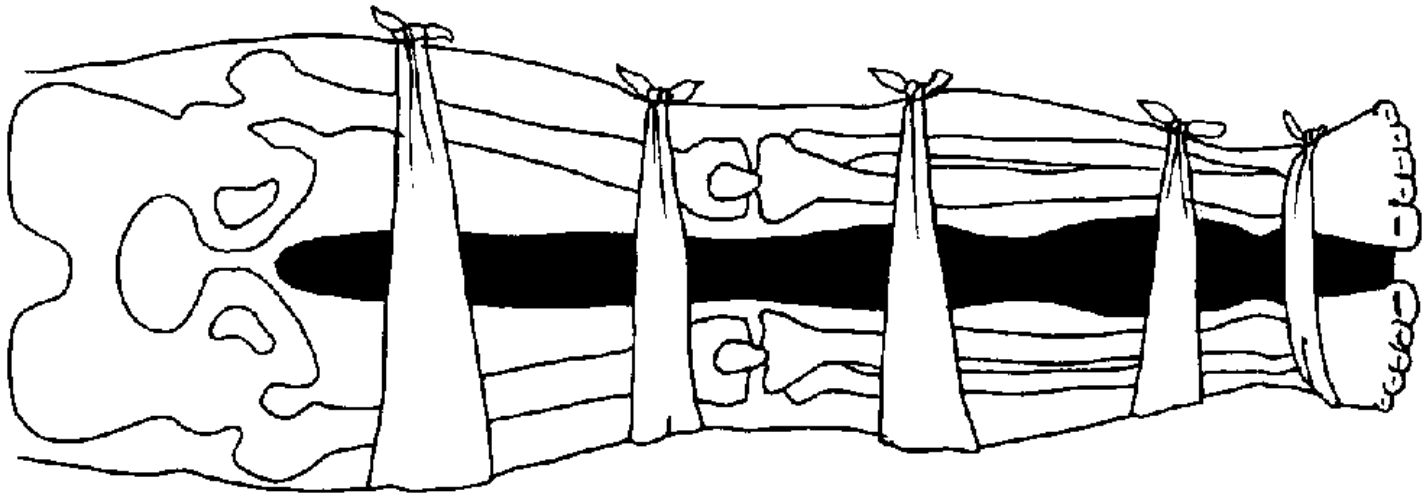

Figure IV-12. Splinting Using A Board

NOTE: Fill in gaps between limbs with soft materials.

Treating Hypothermia

Hypothermia is a condition that occurs when the body temperature drops below normal. Hypothermia may be brought on by exposure to cold air or water or, especially in older people, inadequate food combined with inadequate clothing and/or heat. The primary signs and symptoms of hypothermia are:

- A body temperature of 95^{o} Fahrenheit (37^{o} Celsius) or less.
- Redness or blueness of the skin.
- Numbness accompanied by shivering.

In later stages, hypothermia will be accompanied by slurred speech, unpredictable behavior, and/or listlessness.

Because hypothermia can set in within only a few minutes, victims who have been rescued from cold air or water environments should always be treated for hypothermia. To treat for hypothermia:

- Remove wet clothing, and wrap the victim in a blanket or sleeping bag covering the head and neck.
- Protect the victim against the weather.
- If the victim is conscious, provide warm, sweet drinks and food. Do not offer alcohol or massage.
- If the victim is unconscious, place him or her in the recovery position.
- When possible and only when the victim is conscious, place the victim in a warm bath. Do not rewarm the victim too quickly.

Even when he or she appears to be fully recovered, do not allow the victim to walk around. Do not move the victim outdoors without covering the victim's head and face.

Treating Frostbite

Frostbite is caused by a constriction of the blood vessels in the extremities as the body acts to maintain warmth to the vital organs. Victims who have been exposed to freezing or below-freezing weather may experience frostbite on exposed areas of skin, and on the extremities even when they are covered. The main symptoms of frostbite include:

- Coldness, stiffness, and a "prickly" sensation. (As the area becomes numb, all sensation will disappear.)
- Hardness of the skin.
- Bluish-white discoloration of the affected areas.

To treat victims for frostbite:

- Transport the victim to shelter as soon as possible.
- Remove clothing and jewelry from the affected areas.
- Warm the frostbitten areas with skin-to-skin contact. Do *not* warm the area by placing the victim in front of a heat source. Do *not* massage the affected areas.
- When warmth returns to the affected area, it may develop small blood blisters. Do *not* break the blisters.
- If the frostbitten area is an extremity, elevate it above the level of the chest to reduce pain and swelling.

Public Health Considerations

Introduction

When disaster victims are sheltered together for treatment, public health becomes a concern. Measures must be taken, both by individual medical workers and on a programmatic basis, to avoid the spread of disease through proper hygiene, sanitation, and water purification. Minimizing the spread of disease in the medical operation involves:

- Maintaining proper hygiene.
- Maintaining proper sanitation.
- Purifying water.

Your instructor may add to the guidance suggested in this section. If so, be sure to take careful notes.

Maintaining Hygiene

Maintenance of proper hygiene is critical even under the makeshift conditions encountered in a disaster. Careful attention must be paid to hygiene throughout both triage and treatment to avoid contamination, minimize the risk of infection, and minimize the risk of spreading disease. Some steps that are central to maintaining hygiene include:

- Washing hands frequently with soap and water.
- Wearing latex gloves at all times.
- Changing gloves after examining and/or treating each patient. Under extreme field conditions, use rubber gloves, sterilizing them between victims by washing them in a bleach-and-water solution (1 part bleach to 10 parts water).

Maintaining Hygiene (Continued)

- Wear a mask and goggles.
- Keeping dressings and bandages sterile.
- Avoiding contact with bodily fluids.

Hygiene considerations are an essential part of planning for disaster medical operations and should be emphasized during exercises.

Maintaining Sanitation

Poor sanitation is a major cause of illness, disease, and death. Maintain sanitary conditions during disaster medical operations by:

- Controlling the disposal of bacterial sources (e.g., latex gloves, dressings, etc.).
- Putting waste products in plastic bags and burying them in a designated, well-marked location.
- Burying human waste.

Again, proper sanitation measures should be included in planning and exercise operations.

Water Purification

In the aftermath of a disaster, potable water is often not available—or not available in the quantities required. If potable water supplies have been exhausted or are otherwise not available, purify water for drinking, cooking, and medical use by boiling (rolling boil for 10 minutes), using water purification tablets, or using unscented liquid bleach (16 drops per gallon of water; 1 teaspoon per 5 gallons. After adding bleach, shake or stir the water and let it stand 30 minutes before drinking or other use.).

Summary

Introduction

Disaster medical operations are organized under the CERT Commander. Within medical operations, there are five subfunctions:

- Triage
- Transport
- Treatment
- Morgue
- Supply

After completing triage, victims are sent to treatment areas for:

- Additional triage.
- Further assessment.
- Immediate first aid treatment.

Conducting Head-To-Toe Assessments

Head-to-toe assessments should be both verbal and hands-on. Always perform head-to-toe assessments in the same way, beginning with the head and moving toward the victim's feet.

When conducting head-to-toe assessments, look for anything that might indicate an injury, including:

- Signs of shock.
- Excessive bleeding.
- Bruising or swelling.
- Severe pain.
- Disfigurement.

Always wear latex gloves during assessments and check your own hands for signs of victim bleeding.

The main objective in treating suspected closed head, neck, or spinal injuries is to not cause additional injury. Treat any suspected closed head, neck, or spinal injury as if it were such an injury by using in-line stabilization.

Establishing Treatment Areas

Treatment areas must be established as soon as casualties are confirmed and 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, such as ambulances, trucks, and helicopters.
- Able to grow.

The treatment area must be clearly delineated. Activities there must be well organized and thoroughly documented.

Treating Burns

Burns are classified as first-, second-, or third-degree depending on severity and the depth of skin layers affected. Treatment for burns involves removing the source of the burn, cooling the burn, and covering it. Do *not* use ice or apply antiseptics or ointments to a burn, and do *not* remove shreds of tissue or break blisters. For third-degree burns, always treat for shock.

Wound Care

The main emergency treatment for wounds consists of controlling bleeding, cleaning, and bandaging. Clean the wound with soap and water. Then apply a dressing on the wound area and secure with a bandage. In the absence of active bleeding, dressings must be removed and the wound checked at least every 4 to 6 hours. If there is active bleeding, a new dressing should be placed over the existing dressing, and pressure and elevation should be maintained.

Treating Fractures, Sprains, And Strains

Fractures, sprains, and strains may have similar signs, and exact diagnosis may not be possible without x-rays or other diagnostic measures. Treat fractures, sprains, and strains by immobilizing the affected area using a splint.

Splints can be made from soft or rigid materials, depending on what is available in the immediate treatment area. In some cases, splints may be made by binding two fingers or legs together in several places to immobilize them.

Public Health Considerations

Public health is always a concern in the aftermath of a disaster event. To safeguard public health, take measures to maintain proper hygiene and sanitation and purify water as necessary. All three measures should be thoroughly planned in advance and practiced during disaster exercises.

Preparing For Disaster Medical Operations

In these lessons you have learned some basic lifesaving and first aid techniques to be used in disaster medical operations. This training is only a first step. There is much that cannot be covered within the time constraints of this course. You can enhance your effectiveness as an emergency response team member through practice and continuing education.

- *Practice.* Disaster response teams must work effectively as a team, and each person must know and be comfortable with his or her role. Plan to participate in refresher course simulations as often as they are offered.

- Continuing *Education.* First aid training is an area in which everyone should have a solid foundation of knowledge and skills. This is especially true of disaster workers. To continue developing into an effective rescuer, you should seek supplemental training in skills related to disaster medical operations. Many classes such as Standard and Advanced First Aid, CPR, and Emergency Medical Technician training are available at local American Red Cross chapters and community colleges.

Assignment

Before the next session:

- Read and become familiar with Chapter V: Light Search And Rescue Operations.

Assignment (Continued)

Obtain the following search and rescue safety equipment. Be sure all items have been acquired in time for Session VII.

- Helmet or hardhat
- Goggles
- Leather work gloves
- Sturdy work shoes (preferably steel-toed)
- Clothing appropriate for expected weather conditions (e.g., rain or cold)
- Dust mask
- Whistle (e.g., Clog rescue whistle)

Additional Reading

The references below are available if you would like to know more about the information in this chapter.

California Specialized Training Institute. Disaster Medical Operations. Sacramento, CA: Office Of The State Fire Marshal, 1987.

Grant, Murry Jr., Bergeron, Brady. Brady Emergency Care, Fifth Edition. Prentice Hall, Englewood Cliffs, NJ: 1990.

Heckman, James D. (Ed.). Emergency Care And Transportation Of The Sick And Injured, Fifth Edition. American Academy of Orthopaedic Surgeons, Park Ridge, IL: 1992.

Reader's Digest Action Guide: What To Do In An Emergency. Reader's Digest Association, Pleasantville, NY: 1988.

U.S. Department Of Mine Safety. First Aid. U.S. Government Printing Office, Washington, DC: 1986.

U.S. Department Of The Navy. Self-Care/Buddy-Care. U.S. Government Printing Office, Washington, DC: 1988.

The American Red Cross also provides resources on this subject. Contact your local chapter for information.