CHAPTER 4
FIRST AID FOR FRACTURES

INTRODUCTION

A fracture is any break in the continuity of a bone. Fractures can cause total disability or in some cases death. On the other hand, they can most often be treated so there is complete recovery. A great deal depends upon the first aid the individual receives before he is moved. First aid includes immobilizing the fractured part in addition to applying lifesaving measures. *The basic splinting principle is to immobilize the joints above and below any fracture.*

4-1. Kinds of Fractures

See figure 4-1 for detailed illustration.

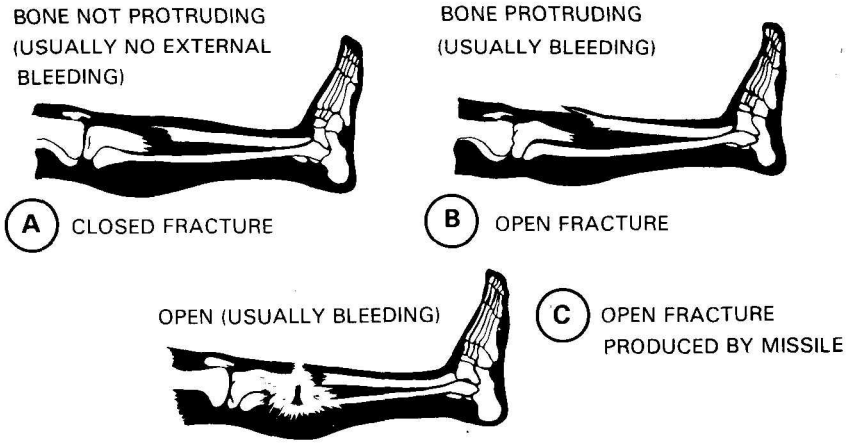


Figure 4-1. Kinds of fractures (Illustrated A thru C).

a. Closed Fracture. A closed fracture is a broken bone that does not break the overlying skin. Tissue beneath the skin may be damaged. A *dislocation* is when a joint, such as a knee, ankle, or shoulder, is not in proper position. A *sprain* is when the connecting tissues of the joints have been torn. *Dislocations* and *sprains* should be treated as *closed fractures.*

b. Open Fracture. An open fracture is a broken bone that breaks (pierces) the overlying skin. The broken bone may come through the skin,

or a missile such as a bullet or shell fragment may go through the flesh and break the bone. An open fracture is contaminated and subject to infection.

4-2. Signs/Symptoms of Fractures *(081-831-1000)*

Indications of a fracture are deformity, tenderness, swelling, pain, inability to move the injured part, protruding bone, bleeding, or discolored skin at the injury site. A sharp pain when the individual attempts to move the part is also a sign of a fracture. DO NOT encourage the casualty to move the injured part in order to identify a fracture since such movement could cause further damage to surrounding tissues and promote shock. If you are not sure whether a bone is fractured, treat the injury as a fracture.

4-3. Purposes of Immobilizing Fractures

A fracture is immobilized to prevent the sharp edges of the bone from moving and cutting tissue, muscle, blood vessels, and nerves. This reduces pain and helps prevent or control shock. In a closed fracture, immobilization keeps bone fragments from causing an open wound and prevents contamination and possible infection. *Splint to immobilize.*

4-4. Splints, Padding, Bandages, Slings, and Swathes *(081-831-1034)*

a. Splints. Splints may be improvised from such items as boards, poles, sticks, tree limbs, rolled magazines, rolled newspapers, or cardboard. If nothing is available for a splint, the chest wall can be used to immobilize a fractured arm and the uninjured leg can be used to immobilize (to some extent) the fractured leg.

b. Padding. Padding may be improvised from such items as a jacket, blanket, poncho, shelter half, or leafy vegetation.

c. Bandages. Bandages may be improvised from belts, rifle slings, bandoleers, kerchiefs, or strips torn from clothing or blankets. Narrow materials such as wire or cord should not be used to secure a splint in place.

d. Slings. A sling is a bandage (or improvised material such as a piece of cloth, a belt, and so forth) suspended from the neck to support an upper extremity. Also, slings may be improvised by using the tail of a coat or shirt, and pieces torn from such items as clothing and blankets. The triangular bandage is ideal for this purpose. Remember that the casualty's hand should be higher than his elbow, and the sling should be applied so that the supporting pressure is on the uninjured side.

e. Swathes. Swathes are any bands (pieces of cloth, pistol belts, and so forth) that are used to further immobilize a splinted fracture. Triangular and cravat bandages are often used as or referred to as swathe bandages. The purpose of the swathe is to immobilize, therefore, the swathe bandage is placed above and/or below the fracture—not over it.

4-5. Procedures for Splinting Suspected Fractures *(081-831-1034)*

Before beginning first aid treatment for a fracture, gather whatever splinting materials are available. Materials may consist of splints, such as wooden boards, branches, or poles. Other splinting materials include padding, improvised cravats, and/or bandages, Ensure that splints are long enough to immobilize the joint above and below the suspected fracture. If possible, use at least four ties (two above and two below the fracture) to secure the splints. The ties should be nonslip knots and should be tied away from the body on the splint.

★ *a. Evaluate the Casualty (081-831-1000).* Be prepared to perform my necessary lifesaving measures. Monitor the casualty for development of conditions which may require you to perform necessary basic lifesaving measures. These measures include clearing the airway, rescue breathing, preventing shock, and/or bleeding control.

WARNING *(081-831-1000)*

Unless there is immediate life-threatening danger, such as a fire or an explosion, DO NOT move the casualty with a suspected back or neck injury. Improper movement may cause permanent paralysis or death.

WARNING *(081-831-1000)*

In a chemical environment, DO NOT remove any protective clothing. Apply the dressing/splint over the clothing.

b. Locate the Site of the Suspected Fracture. Ask the casualty for the location of the injury. *Does he have any pain? Where is it tender? Can he move the extremity?* Look for an unnatural position of the extremity. Look for a bone sticking out (protruding).

c. Prepare the Casualty for Splinting the Suspected Fracture (081-831-1034).

(1) Reassure the casualty. Tell him that you will be taking care of him and that medical aid is on the way.

(2) Loosen any tight or binding clothing.

(3) Remove all the jewelry from the casualty and place it in the casualty's pocket. Tell the casualty you are doing this because if the jewelry is not removed at this time and swelling occurs later, further bodily injury can occur.

NOTE

Boots should not be removed from the casualty unless they are needed to stabilize a neck injury, or there is actual bleeding from the foot.

d. Gather Splinting Materials (081-831-1034). If standard splinting materials (splints, padding, cravats, and so forth) are not available, gather improvised materials. Splints can be improvised from wooden boards, tree branches, poles, rolled newspapers or magazines. Splints should be long enough to reach beyond the joints above and below the suspected fracture site. Improvised padding, such as a jacket, blanket, poncho, shelter half, or leafy vegetation may be used. A cravat can be improvised from a piece of cloth, a large bandage, a shirt, or a towel. Also, to immobilize a suspected fracture of an arm or a leg, parts of the casualty's body may be used. For example, the chest wall may be used to immobilize an arm; and the uninjured leg may be used to immobilize the injured leg.

NOTE

If splinting material is not available and suspected fracture CANNOT be splinted, then swathes, or a combination of swathes and slings can be used to immobilize an extremity.

e. Pad the Splints (081-831-1034). Pad the splints where they touch any bony part of the body, such as the elbow, wrist, knee, ankle, crotch, or armpit area. Padding prevents excessive pressure to the area.

f. Check the Circulation Below the Site of the Injury (081-831-1034).

(1) Note any pale, white, or bluish-gray color of the skin which may indicate impaired circulation. Circulation can also be checked

by depressing the toe/fingernail beds and observing how quickly the color returns. A slower return of pink color to the injured side when compared with the uninjured side indicates a problem with circulation. Depressing the toe/fingernail beds is a method to use to check the circulation in a dark-skinned casualty.

(2) Check the temperature of the injured extremity. Use your hand to compare the temperature of the injured side with the uninjured side of the body. The body area below the injury maybe colder to the touch indicating poor circulation.

(3) Question the casualty about the presence of numbness, tightness, cold, or tingling sensations.

WARNING

Casualties with fractures to the extremities may show impaired circulation, such as numbness, tingling, cold and/or pale to blue skin. These casualties should be evacuated by medical personnel and treated as soon as possible. Prompt medical treatment may prevent possible loss of the limb.

WARNING

If it is an open fracture (skin is broken; bone(s) may be sticking out), DO NOT ATTEMPT TO PUSH BONE(S) BACK UNDER THE SKIN. Apply a field dressing to protect the area. See Task 081-831-1016, *Put on a Field or Pressure Dressing.*

g. Apply the Splint in Place (081-831-1034).

(1) Splint the fracture(s) in the position found. DO NOT attempt to reposition or straighten the injury. If it is an open fracture, stop the bleeding and protect the wound. (See Chapter 2, Section II, for detailed information.) Cover all wounds with field dressings before applying a splint. Remember to use the casualty's field dressing, not your own. If bones are protruding (sticking out), DO NOT attempt to push them back under the skin. Apply dressings to protect the area.

(2) Place one splint on each side of the arm or leg. Make sure that the splints reach, if possible, beyond the joints above and below the fracture.

(3) Tie the splints. Secure each splint in place *above* and *below* the fracture site with improvised (or actual) cravats. Improvised cravats, such as strips of cloth, belts, or whatever else you have, may be used. With minimal motion to the injured areas, place and tie the splints with the bandages. *Push cravats* through and under the natural body curvatures (spaces), and then gently position improvised cravats and tie in place. Use nonslip knots. Tie all knots on the splint away from the casualty (Figure 4-2). DO NOT tie cravats directly over suspected fracture/dislocation site.

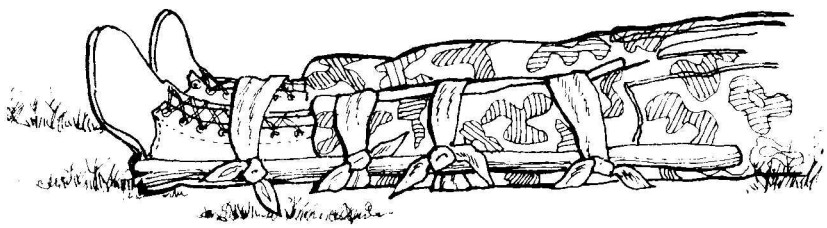


Figure 4-2. Nonslip knots tied away from casualty.

h. Check the Splint for Tightness (081-831-1034).

(1) *Check* to be sure that bandages are tight enough to securely hold splinting materials in place, but not so tight that circulation is impaired.

(2) *Recheck* the circulation after application of the splint. Check the skin color and temperature. This is to ensure that the bandages holding the splint in place have not been tied too tightly. A finger tip check can be made by inserting the tip of the finger between the wrapped tails and the skin.

(3) *Make* any adjustment without allowing the splint to become ineffective.

i. Apply a Sling if Applicable (081-831-1034). An improvised sling may be made from any available nonstretching piece of cloth, such as a fatigue shirt or trouser, poncho, or shelter half. Slings may also be improvised using the tail of a coat, belt, or a piece of cloth from a blanket or some clothing. See Figure 4-3 for an illustration of a shirt tail used for

support. A pistol belt or trouser belt also may be used for support (Figure 4-4). A sling should place the supporting pressure on the casualty's uninjured side. The supported arm should have the hand positioned slightly higher than the elbow.

Figure 4-3. Shirt tail used for support.

Figure 4-4. Belt used for support.

(1) Insert the splinted arm in the center of the sling (Figure 4-5).

Figure 4-5. Arm inserted in center of improvised sling.

(2) Bring the ends of the sling up and tie them at the side (or hollow) of the neck on the uninjured side (Figure 4-6).

Figure 4-6. Ends of improvised sling tied to side of neck.

(3) Twist and tuck the corner of the sling at the elbow (Figure 4-7).

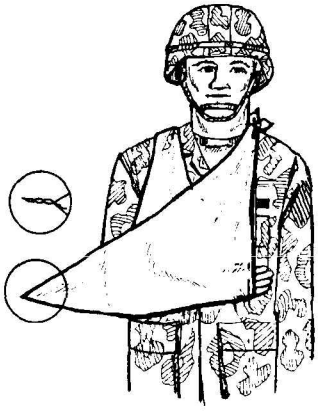


Figure 4-7. Corner of sling twisted and tucked at elbow.

j. Apply a Swathe if Applicable (081-831-1034). You may use any large piece of cloth, such as a soldier's belt or pistol belt, to improvise a swathe. A swathe is any band (a piece of cloth) or wrapping used to further immobilize a fracture. When splints are unavailable, swathes, or a combination of swathes and slings can be used to immobilize an extremity.

WARNING *(081-831-1034)*

The swathe should not be placed directly on top of the injury, but positioned either above and/or below the fracture site.

(1) Apply swathes to the injured arm by wrapping the swathe over the injured arm, around the casualty's back and under the arm on the uninjured side. Tie the ends on the uninjured side (Figure 4-8).

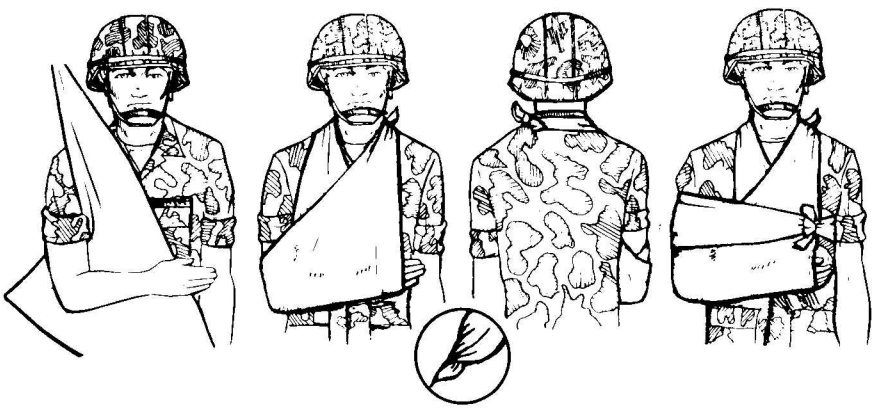
Figure 4-8. Arm immobilized with strip of clothing.

(2) A swathe is applied to an injured leg by wrapping the swathe(s) around both legs and securing it on the uninjured side.

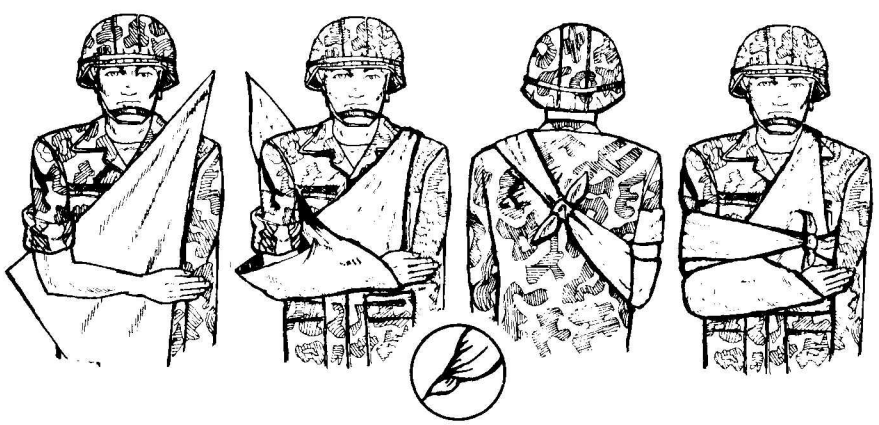
k. Seek Medical Aid. Notify medical personnel, watch closely for development of life-threatening conditions, and if necessary, continue to evaluate the casualty.

4-6. Upper Extremity Fractures *(081-831-1034)*

Figures 4-9 through 4-16 show how to apply slings, splints, and cravats (swathes) to immobilize and support fractures of the upper extremities. *Although the padding is not visible in some of the illustrations, it is always preferable to apply padding along the injured part for the length of the splint and especially where it touches any bony parts of the body.*



METHOD 1



METHOD 2

Figure 4-9. Application of triangular bandage to form sling (two methods).

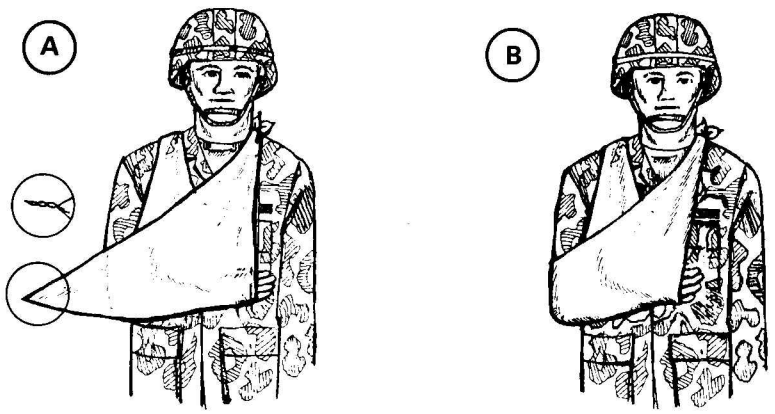


Figure 4-10. Completing sling sequence by twisting and tucking the corner of the sling at the elbow (Illustrated A and B).

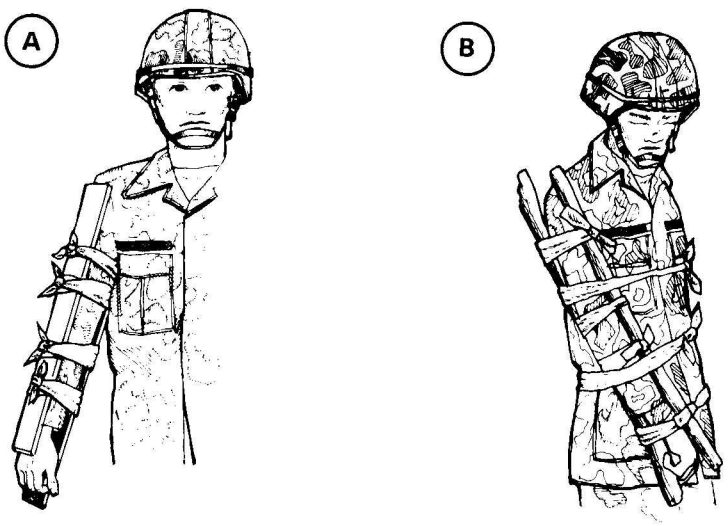


Figure 4-11. Board splints applied to fractured elbow when elbow is not bent (two methods) (081-831-1034) (Illustrated A and B).

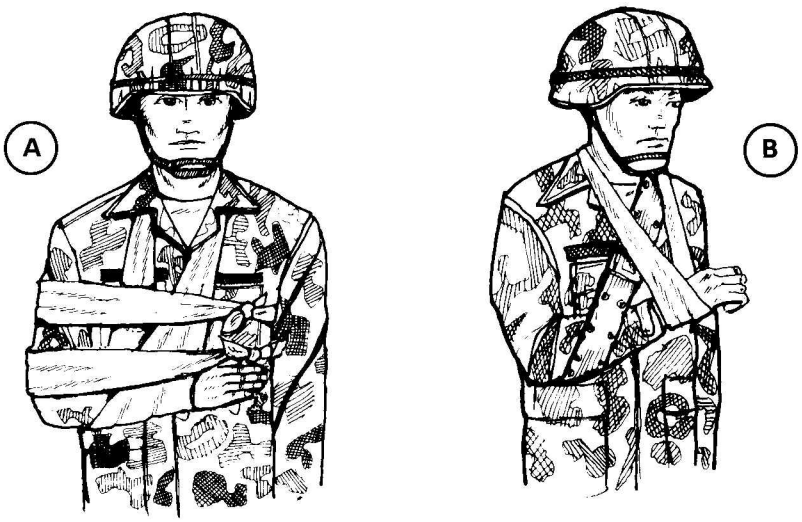


Figure 4-12. Chest wall used as splint for upper arm fracture when no splint is available (Illustrated A and B).

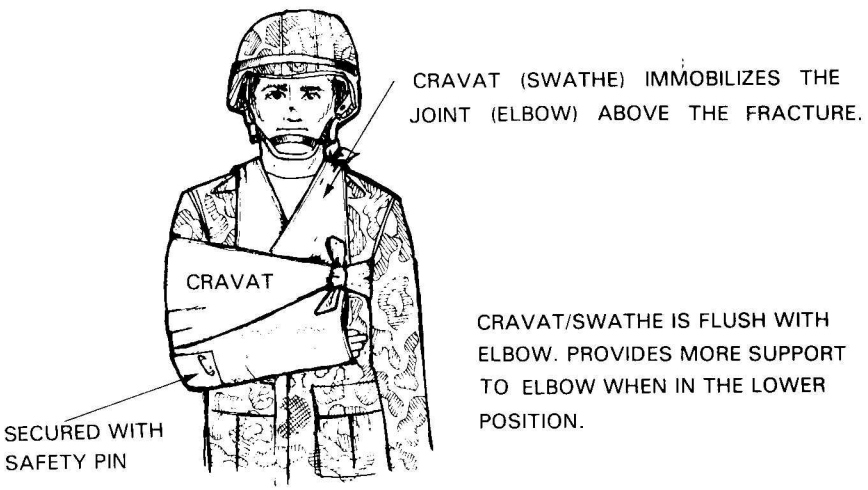


Figure 4-13. Chest wall, sling, and cravat used to immobilize fractured elbow when elbow is bent.

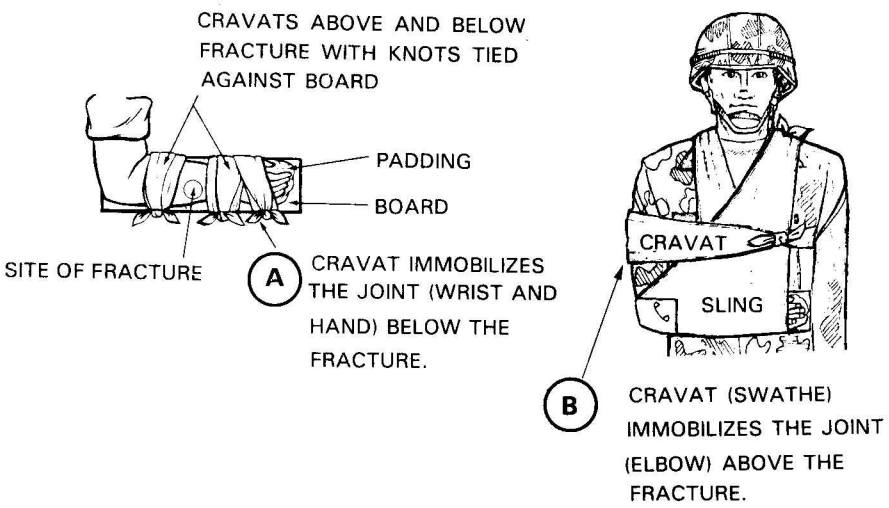


Figure 4-14. Board splint applied to fractured forearm (Illustrated A and B).

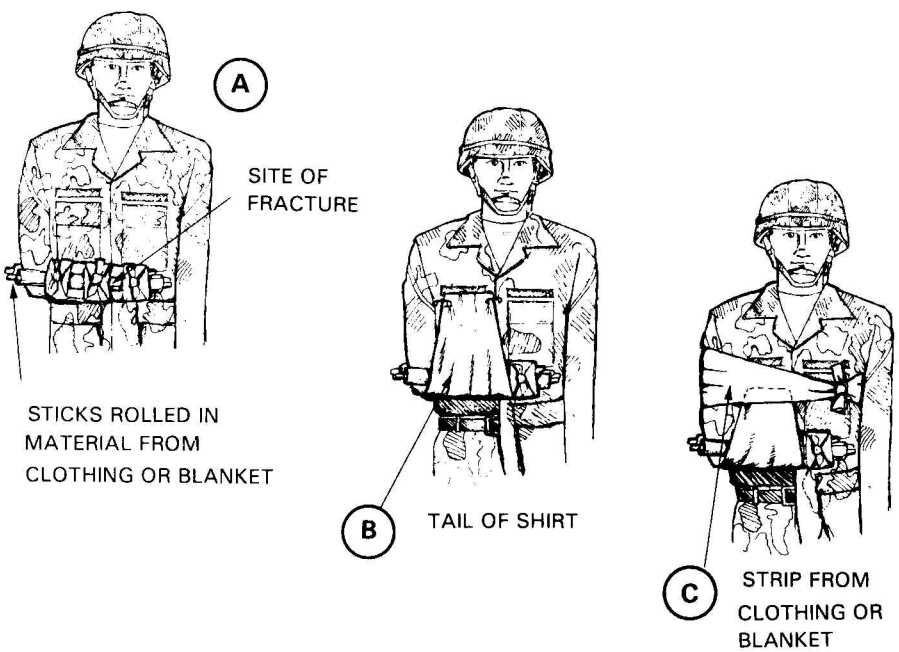


Figure 4-15. Fractured forearm or wrist splinted with sticks and supported with tail of shirt and strips of material (Illustrated A thru C).

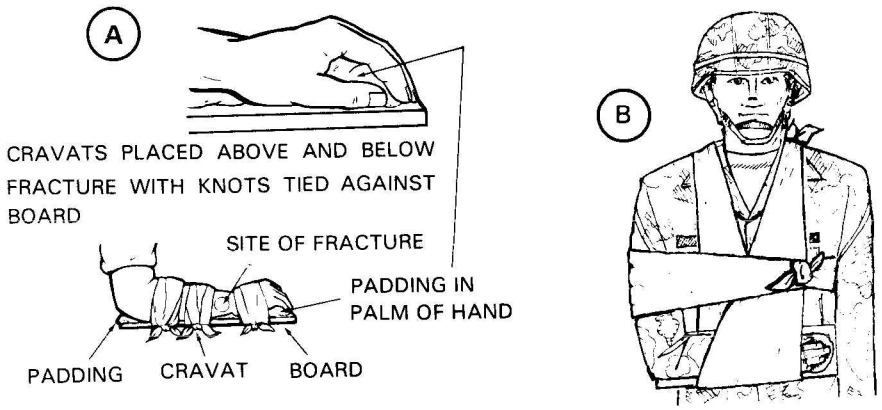


Figure 4-16. Board splint applied to fractured wrist and hand (Illustrated A thru C).

4-7. Lower Extremity Fractures *(081-831-1034)*

Figures 4-17 through 4-22 show how to apply splints to immobilize fractures of the lower extremities. *Although padding is not visible in some of the figures, it is preferable to apply padding along the injured part for the length of the splint and especially where it touches any bony parts of the body.*

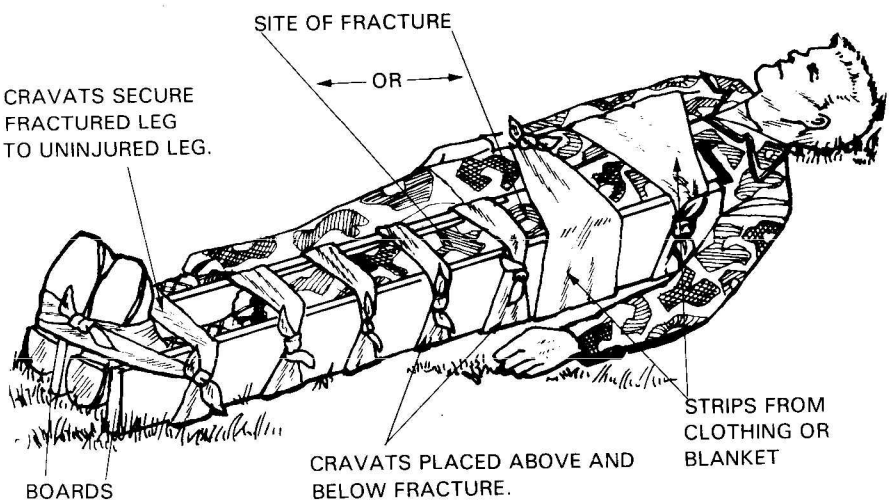


Figure 4-17. Board splint applied to fractured hip or thigh (081-831-1034).

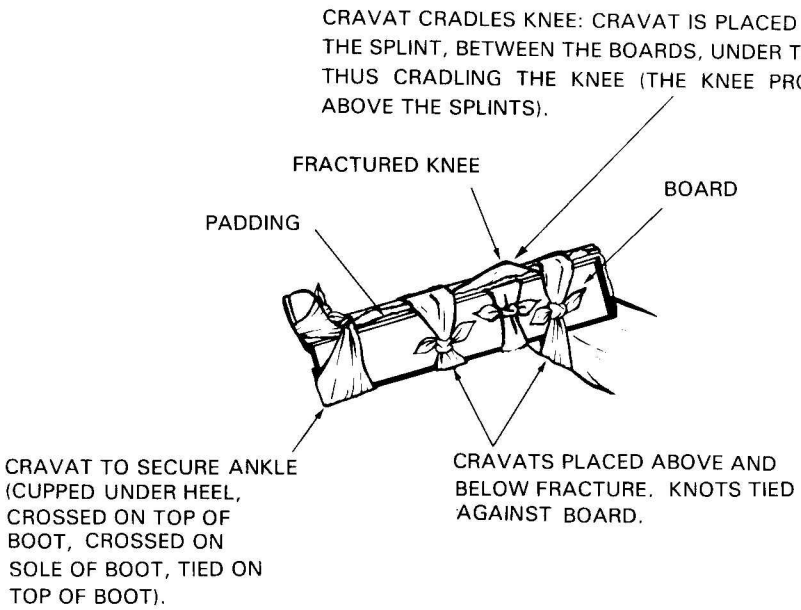


Figure 4-18. Board splint applied to fractured or dislocated knee (081-831-1034).

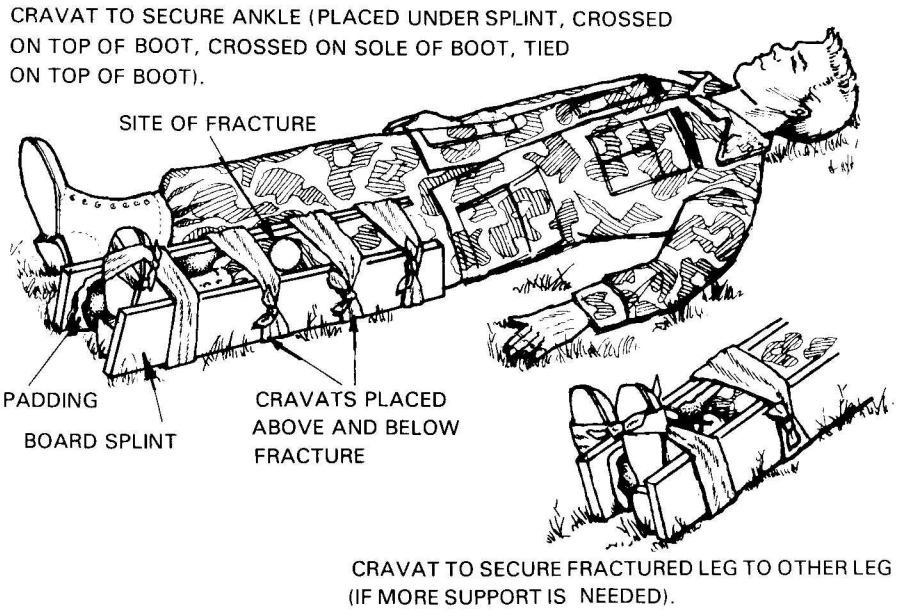


Figure 4-19. Board splint applied to fractured lower leg or ankle.

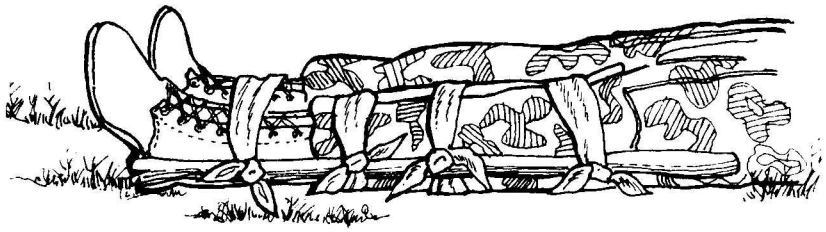


Figure 4-20. Improvised splint applied to fractured lower leg or ankle.

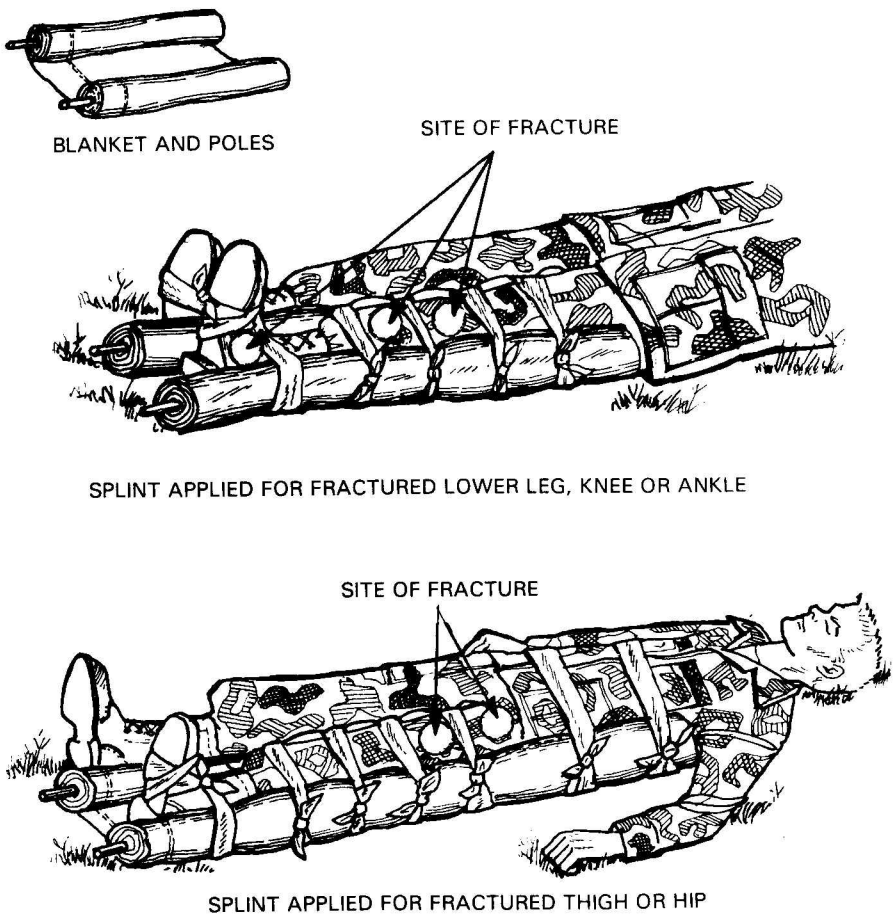


Figure 4-21. Poles rolled in a blanket and used as splints applied to fractured lower extremity.

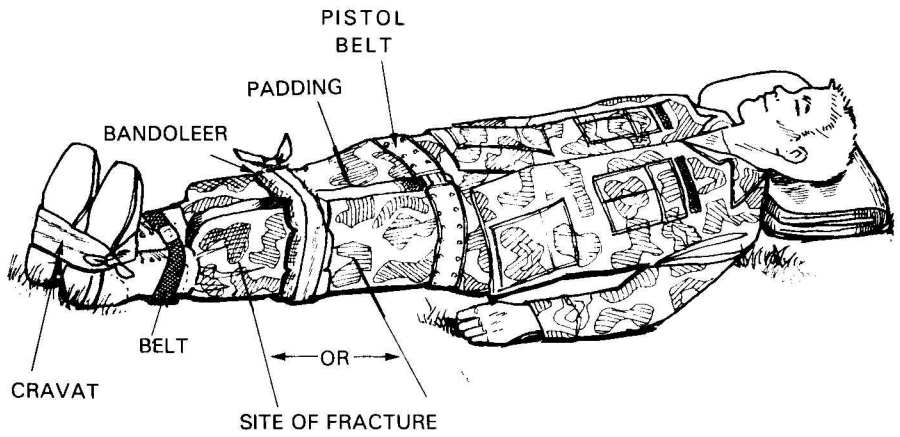


Figure 4-22. Uninjured leg used as splint for fractured leg (anatomical splint).

4-8. Jaw, Collarbone, and Shoulder Fractures

a. Apply a cravat to immobilize a fractured jaw as illustrated in Figure 4-23. Direct all bandaging support to the top of the casualty's head, not to the back of his neck. If incorrectly placed, the bandage will pull the casualty's jaw back and interfere with his breathing.

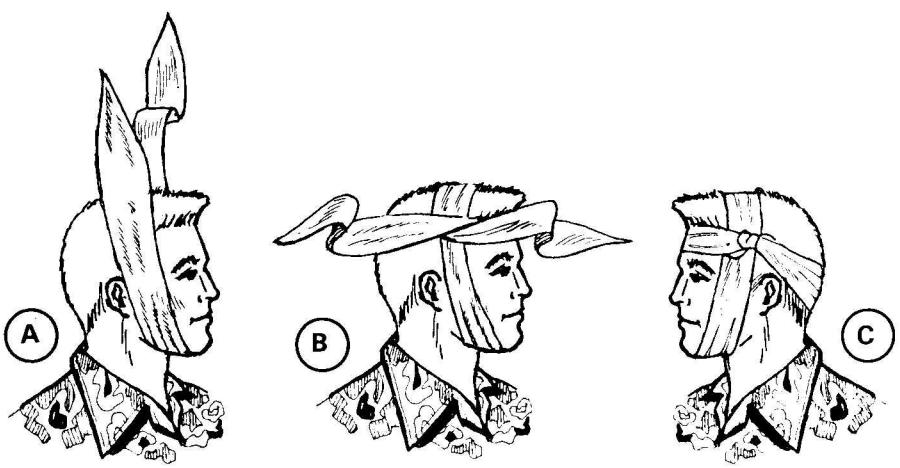


Figure 4-23. Fractured jaw immobilized (Illustrated A thru C).

CAUTION

Casualties with lower jaw (mandible) fractures cannot be laid flat on their backs because facial muscles will relax and may cause an airway obstruction.

b. Apply two belts, a sling, and a cravat to immobilize a fractured collarbone, as illustrated in Figure 4-24.

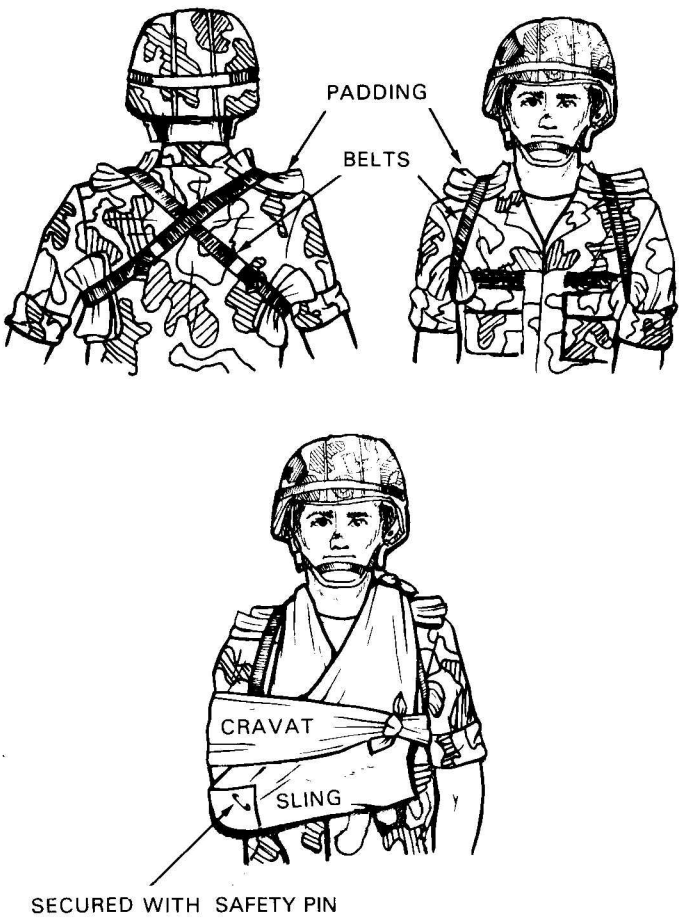


Figure 4-24. Application of belts, sling, and cravat to immobilize a collarbone.

c. Apply a sling and a cravat to immobilize a fractured or dislocated shoulder, using the technique illustrated in Figure 4-25.

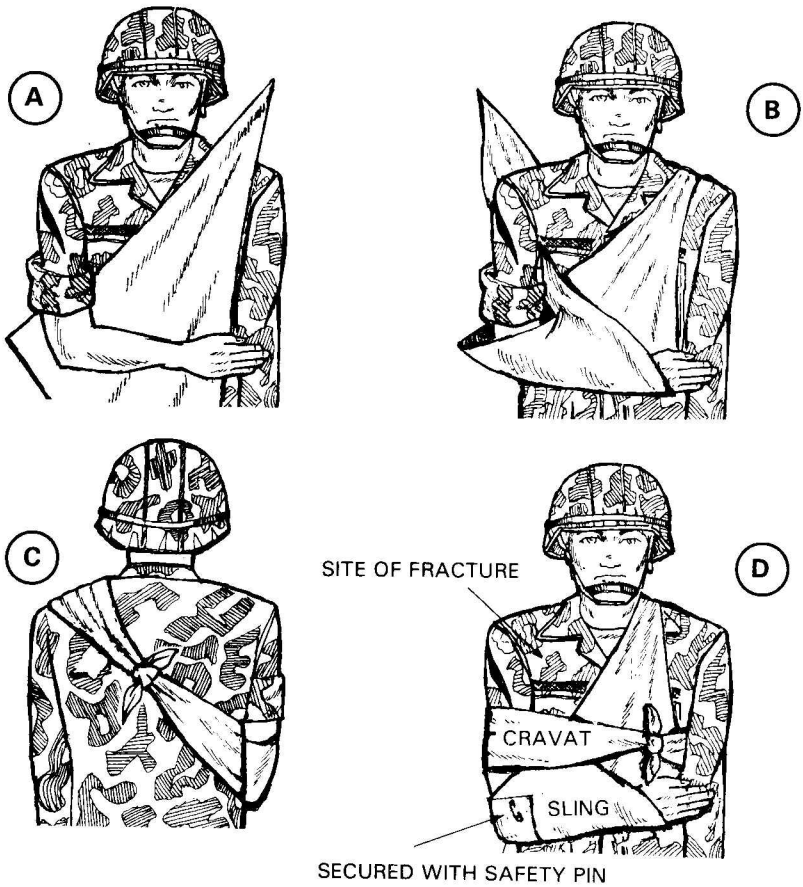


Figure 4-25. Application of sling and cravat to immobilize a fractured or dislocated shoulder (Illustrated A thru D).

4-9. Spinal Column Fractures *(081-831-1000)*

It is often impossible to be sure a casualty has a fractured spinal column. Be suspicious of any back injury, especially if the casualty has fallen or if his back has been sharply struck or bent. If a casualty has received such an injury and does not have feeling in his legs or cannot move them, you can be reasonably sure that he has a severe back injury which should be

treated as a fracture. Remember, if the spine is fractured, bending it can cause the sharp bone fragments to bruise or cut the spinal cord and result in permanent paralysis (Figure 4-26A). The spinal column must maintain a swayback position to remove pressure from the spinal cord.

a. If the Casualty Is Not to Be Transported (081-831-1000) Until Medical Personnel Arrive—

- Caution him not to move. Ask him if he is in pain or if he is unable to move any part of his body.

- Leave him in the position in which he is found. *DO NOT* move any part of his body.

- Slip a blanket, if he is lying face up, or material of similar size, under the arch of his back to support the spinal column in a swayback position (Figure 4-26 B). If he is lying face down, DO NOT put anything under any part of his body.

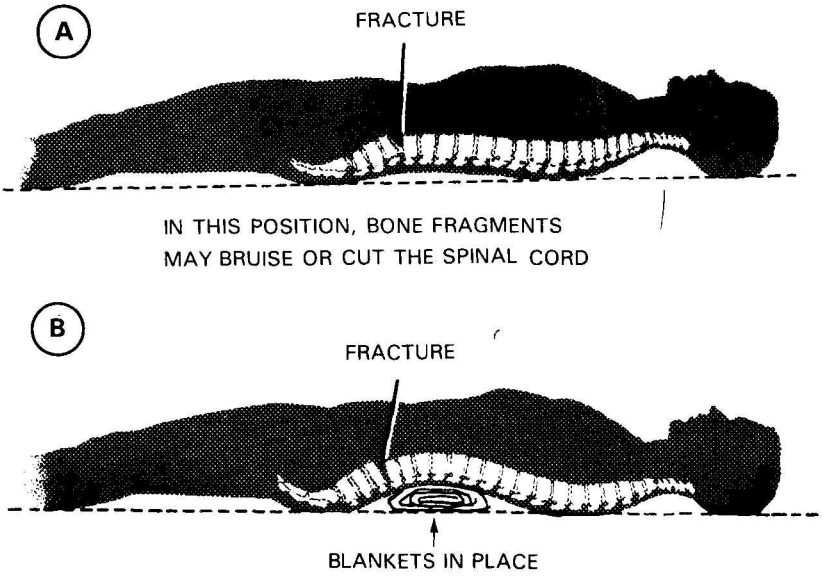


Figure 4-26. Spinal column must maintain a swayback position (Illustrated A and B).

b. If the Casualty Must Be Transported to A Safe Location Before Medical Personnel Arrive—

- And if the casualty is in a face-up position, transport him by litter or use a firm substitute, such as a wide board or a flat door longer than his height. Loosely tie the casualty's wrists together over his waistline, using a cravat or a strip of cloth. Tie his feet together to prevent the accidental dropping or shifting of his legs. Lay a folded blanket across the litter where the arch of his back is to be placed. Using a four-man team (Figure 4-27), place the casualty on the litter without bending his spinal column or his neck.

Figure 4-27. Placing face-up casualty with fractured back onto litter.

o The number *two, three,* and *four* men position themselves on one side of the casualty; all kneel on one knee along the side of the casualty. The number one man positions himself to the opposite side of the casualty. The number *two, three,* and *four* men gently place their hands under the casualty. The number one man on the opposite side places his hands under the injured part to assist.

o When all four men are in position to lift, the number *two* man commands, "PREPARE TO LIFT" and then, "LIFT." All men, in unison, gently lift the casualty about 8 inches. Once the casualty is lifted, the number *one* man *recovers* and *slides* the litter under the casualty, ensuring that the blanket is in proper position. The number *one* man then returns to his original lift position (Figure 4-27).

o When the number *two* man commands, "LOWER CASUALTY," all men, in unison, gently lower the casualty onto the litter.

• And if the casualty is in a face-down position, he must be transported in this same position. The four-man team lifts him onto a regular or improvised litter, keeping the spinal column in a swayback position. If a regular litter is used, first place a folded blanket on the litter at the point where the chest will be placed.

4-10. Neck Fractures *(081-831-1000)*

A fractured neck is extremely dangerous. Bone fragments may bruise or cut the spinal cord just as they might in a fractured back.

a. If the Casualty Is Not to Be Transported (081-831-1000) Until Medical Personnel Arrive—

• Caution him not to move. Moving may cause death.

• Leave the casualty in the position in which he is found. If his neck/head is in an abnormal position, *immediately* immobilize the neck/head. Use the procedure stated below.

o Keep the casualty's head still, if he is lying face up, raise his shoulders slightly, and slip a roll of cloth that has the bulk of a bath towel under his neck (Figure 4-28). The roll should be thick enough to arch his neck only slightly, leaving the back of his head on the ground. DO NOT bend his neck or head forward. DO NOT raise or twist his head.

Immobilize the casualty's head (Figure 4-29). Do this by padding heavy objects such as rocks or his boots and placing them on each side of his head. If it is necessary to use boots, first fill them with stones, gravel, sand, or dirt and tie them tightly at the top. If necessary, stuff pieces of material in the top of the boots to secure the contents.

Figure 4-28. Casualty with roll of cloth (bulk) under neck.

Figure 4-29. Immobilization of fractured neck.

o DO NOT move the casualty if he is lying face down. Immobilize the head/neck by padding heavy objects and placing them on each side of his head. DO NOT put a roll of cloth under the neck. DO NOT bend the neck or head, nor roll the casualty onto his back.

b. If the Casualty Must be Prepared for Transportation Before Medical Personnel Arrive—

- And he has a fractured neck, at least two persons are needed because the casualty's head and trunk must be moved in unison. The two persons must work in close coordination (Figure 4-30) to avoid bending the neck.

- Place a wide board lengthwise beside the casualty. It should extend at least 4 inches beyond the casualty's head and feet (Figure 4-30 A).

- If the casualty is lying *face up,* the number *one* man steadies the casualty's head and neck between his hands. At the same time the number *two* man positions one foot and one knee against the board to prevent it from slipping, grasps the casualty underneath his shoulder and hip, and gently slides him onto the board (Figure 4-30 B).

- If the casualty is lying *face down,* the number *one* man steadies the casualty's head and neck between his hands, while the number *two* man gently rolls the casualty over onto the board (Figure 4-30 C).

- The number *one* man continues to steady the casualty's head and neck. The number *two* man simultaneously raises the casualty's shoulders slightly, places padding under his neck, and immobilizes the casualty's head (Figures 4-30 D, and E). The head may be immobilized with the casualty's boots, with stones rolled in pieces of blanket, or with other material.

- Secure any improvised supports in position with a cravat or strip of cloth extended across the casualty's forehead and under the board (Figure 4-30 D).

- Lift the board onto a litter or blanket in order to transport the casualty (Figure 4-30 E).

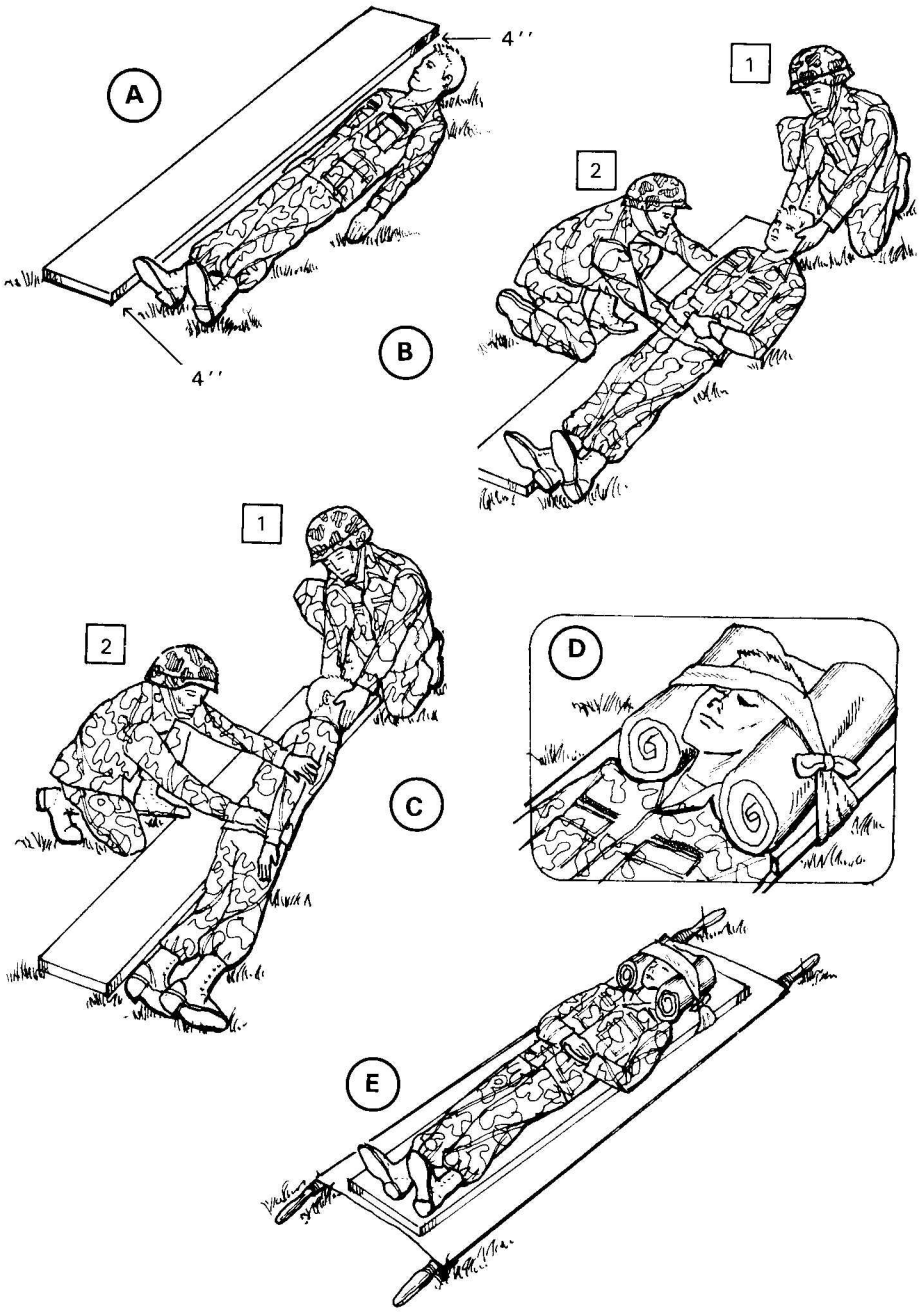


Figure 4-30. Preparing casualty with fractured neck for transportation (Illustrated A thru E).

NOTES

CHAPTER 5
FIRST AID FOR CLIMATIC INJURIES
INTRODUCTION

It is desirable, but not always possible, for an individual's body to become adjusted (acclimatized) to an environment. Physical condition determines the time adjustment, and trying to rush it is ineffective. Even those individuals in good physical condition need time before working or training in extremes of hot or cold weather. Climate-related injuries are usually preventable; prevention is both an individual and leadership responsibility. Several factors contribute to health and well-being in any environment: diet, sleep/rest, exercise, and suitable clothing. These factors are particularly important in extremes of weather. Diet, especially, should be suited to an individual's needs in a particular climate. A special diet undertaken for *any* purpose should be done so with appropriate supervision. This will ensure that the individual is getting a properly balanced diet suited to both climate and personal needs, whether for weight reduction or other purposes. The wearing of specialized protective gear or clothing will sometimes add to the problem of adjusting to a particular climate. Therefore, soldiers should exercise caution and judgment in adding or removing specialized protective gear or clothing.

5-1. Heat Injuries *(081-831-1008)*

Heat injuries are environmental injuries that may result when a soldier is exposed to extreme heat, such as from the sun or from high temperatures. Prevention depends on availability and consumption of adequate amounts of water. Prevention also depends on proper clothing and appropriate activity levels. Acclimatization and protection from undue heat exposure are also very important. Identification of high risk personnel (basic trainees, troops with previous history of heat injury, and overweight soldiers) helps both the leadership and the individual prevent and cope with climatic conditions. Instruction on living and working in hot climates also contributes toward prevention.

NOTE

Salt tablets should not be used in the prevention of heat injury. Usually, eating field rations or liberal salting of the garrison diet will provide enough salt to replace what is lost through sweating in hot weather.

a. Diet. A balanced diet usually provides enough salt even in hot weather. But when people are on reducing or other diets, salt may need to come from other sources. DO NOT use *salt tablets to supplement a diet.* Anyone on a special diet (for whatever purpose) should obtain professional help to work out a properly balanced diet.

b. Clothing.

(1) The type and amount of clothing and equipment a soldier wears and the way he wears it also affect the body and its adjustment to the environment. Clothing protects the body from radiant heat. However, excessive or tight-fitting clothing, web equipment, and packs reduce ventilation needed to cool the body. During halts, rest stops, and other periods when such items are not needed, they should be removed, mission permitting.

(2) The *individual protective equipment* (IPE) protects the soldier from chemical and biological agents. The equipment provides a barrier between him and a toxic environment. However, a serious problem associated with the chemical overgarment is *heat stress.* The body normally maintains a heat balance, but when the overgarment is worn the body sometimes does not function properly. Overheating may occur rapidly. Therefore, strict adherence to *mission oriented protective posture* (MOPP) levels directed by your commander is important. This will keep those heat related injuries caused by wearing the IPE to a minimum. See FM 3-4 for further information on MOPP.

c. Prevention. The ideal fluid replacement is water. The availability of sufficient water during *work or training* in hot weather is very important. The body, which depends on water to help cool itself, can lose more than a quart of water per hour through sweat. Lost fluids must be replaced quickly. Therefore, during these *work or training periods,* you should drink at least one canteen full of water every hour. In extremely hot climates or extreme temperatures, drink at least a full canteen of water every half hour, if possible. In such hot climates, the body depends mainly upon sweating to keep it cool, and water intake must be maintained to allow sweating to continue. Also, keep in mind that a person who has suffered one heat injury is likely to suffer another. Before a heat injury casualty returns to work, he should have recovered well enough not to risk a recurrence. Other conditions which may increase heat stress and cause heat injury include infections, fever, recent illness or injury, overweight, dehydration, exertion, fatigue, heavy meals, and alcohol. In all this, *note that salt tablets should not be used as a preventive measure.*

d. Categories. Heat injury can be divided into three categories: heat cramps, heat exhaustion, and heatstroke.

e. First Aid. Recognize and give first aid for heat injuries.

WARNING

Casualty should be continually monitored for development of conditions which may require the performance of necessary basic lifesaving measures, such as: clearing the airway, performing mouth-to-mouth resuscitation, preventing shock, and/or bleeding control.

★ CAUTION

DO NOT use salt solution in first aid procedures for heat injuries.

(1) *Check the casualty for signs and symptoms of heat cramps (081-831-1008).*

- *Signs/Symptoms.* Heat cramps are caused by an imbalance of chemicals (called electrolytes) in the body as a result of excessive sweating. This condition causes the casualty to exhibit:
  - o Muscle cramps in the extremities (arms and legs).
  - o Muscle cramps of the abdomen.
  - o Heavy (excessive) sweating (wet skin).
  - o Thirst.
- *Treatment.*
  - o Move the casualty to a cool or shady area (or improvise shade).
  - o Loosen his clothing (if not in a chemical environment).
  - o Have him slowly drink at least one canteen full of cool water.
  - o Seek medical aid should cramps continue.

WARNING

DO NOT loosen the casualty's clothing if in a chemical environment.

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(2) *Check the casualty for signs and symptoms of heat exhaustion (081-831-1008).*

- *Signs/Symptoms which occur* ***often.*** Heat exhaustion is caused by loss of water through sweating without adequate fluid replacement. It can occur in an otherwise fit individual who is involved in tremendous physical exertion in any hot environment. The signs and symptoms are similar to those which develop when a person goes into a state of shock.

o Heavy (excessive) sweating with pale, moist, cool skin.

o Headache.

o Weakness.

o Dizziness.

o Loss of appetite.

Signs/Symptoms which occur ***sometimes.***

o Heat cramps.

o Nausea—with or without vomiting.

o Urge to defecate.

o Chills (gooseflesh).

o Rapid breathing.

o Tingling of hands and/or feet.

o Confusion.

- *Treatment.*

o Move the casualty to a cool or shady area (or improvise shade).

o Loosen or remove his clothing and boots (unless in a chemical environment). Pour water on him and fan him (unless in a chemical environment).

o Have him slowly drink at least one canteen full of cool water.

o Elevate his legs.

o If possible, the casualty should not participate in strenuous activity for the remainder of the day.

o Monitor the casualty until the symptoms are gone, or medical aid arrives.

(3) *Check the casualty for signs and symptoms of heatstroke (sometimes called "sunstroke") (081-831-1008).*

WARNING

Heatstroke must be considered a medical emergency which may result in death if treatment is delayed.

● *Signs/Symptoms.* A casualty suffering from heatstroke has usually worked in a very hot, humid environment for a prolonged time. It is caused by failure of the body's cooling mechanisms. Inadequate sweating is a factor. The casualty's skin is red (flushed), hot, and dry. He may experience weakness, dizziness, confusion, headaches, seizures, nausea (stomach pains), and his respiration and pulse may be rapid and weak. Unconsciousness and collapse may occur suddenly.

● *Treatment.* Cool casualty immediately by—

o Moving him to a cool or shaded area (or improvise shade).

o Loosening or removing his clothing (except in a chemical environment).

★ o Spraying or pouring water on him; fanning him to permit a coolant effect of evaporation.

o Massaging his extremities and skin which increases the blood flow to those body areas, thus aiding the cooling process.

o Elevating his legs.

o Having him slowly drink at least one canteen full of water if he is conscious.

NOTE

Start cooling casualty *immediately.* Continue cooling while awaiting transportation and during the evacuation.

• *Medical aid.* Seek medical aid because the casualty should be transported to a medical treatment facility as soon as possible. Do not interrupt cooling process or lifesaving measures to seek help.

• Casualty should be continually monitored for development of conditions which may require the performance of necessary basic lifesaving measures, such as clearing the airway, mouth-to-mouth resuscitation, preventing shock, and/or bleeding control.

f. Table. See Table 5-1 for further information.

Table 5-1. Sun or Heat Injuries (081-831-1008)

INJURIES	SIGNS/SYMPTOMS	FIRST AID*
Heat cramps	The casualty experiences muscle cramps of arms, legs, and/or stomach. The casualty may also have heavy sweating (wet skin) and extreme thirst.	1. Move the casualty to a shady area or improvise shade and loosen his clothing.+ 2. Give him large amounts of cool water slowly. 3. Monitor the casualty and give him more water as tolerated. 4. Seek medical aid if the cramps continue.
Heat exhaustion	The casualty *often* experiences profuse (heavy) sweating with pale, moist, cool skin; headache, weakness, dizziness, and/or loss of appetite.	1. Move the casualty to a cool, shady area or improvise shade and loosen/remove his clothing.+ 2. Pour water on him and fan him to permit coolant effect of evaporation. 3. Have him slowly drink at least one canteen full of water.

Table 5-1. Continued.

Heat exhaustion *Continued.*	The casualty *sometimes* experiences heat cramps, nausea (with or without vomiting), urge to defecate, chills (gooseflesh), rapid breathing, confusion, and tingling of the hands and/or feet.	4. Elevate the casualty's legs. 5. Seek medical aid if symptoms continue; monitor the casualty until the symptoms are gone or medical aid arrives.
Heatstroke# **(sunstroke)**	The casualty stops sweating (red [flushed] hot, dry skin). He first may experience headache, dizziness, nausea, fast pulse and respiration, seizures, and mental confusion. He may collapse and suddenly become unconscious. *THIS IS A MEDICAL EMERGENCY.*	1. Move the casualty to a cool, shady area or improvise shade and loosen or remove his clothing, remove the outer garments and protective clothing if the situation permits.+ ★2. Start cooling the casualty immediately. Spray or pour water on him. Fan him. Massage his extremities and skin. 3. Elevate his legs. 4. If conscious, have him slowly drink at least one canteen full of water. 5. SEEK MEDICAL AID. CONTINUE COOLING WHILE AWAITING TRANSPORT AND DURING EVACUATION. EVACUATE AS SOON AS POSSIBLE. PERFORM ANY NECESSARY LIFESAVING MEASURES.

*The *first aid procedure* for heat related injuries caused by wearing *individual protective equipment* is to move the casualty to a clean area and give him water to drink.

+When in a chemical environment, DO NOT loosen/remove the casualty's clothing.

#Can be fatal if not treated promptly and correctly.

5-2. Cold Injuries *(081-831-1009)*

Cold injuries are most likely to occur when an unprepared individual is exposed to winter temperatures. They can occur even with proper planning and equipment. The cold weather and the type of combat operation in which the individual is involved impact on whether he is likely to be injured and to what extent. His clothing, his physical condition, and his mental makeup also are determining factors. However, cold injuries can usually be prevented. Well-disciplined and well-trained individuals can be protected even in the most adverse circumstances. They and their leaders must know the hazards of exposure to the cold. They must know the importance of personal hygiene, exercise, care of the feet and hands, and the use of protective clothing.

a. Contributing Factors.

(1) *Weather.* Temperature, humidity, precipitation, and wind modify the loss of body heat. Low temperatures and low relative humidity-dry cold—promote frostbite. Higher temperatures, together with moisture, promote immersion syndrome. Windchill accelerates the loss of body heat and may aggravate cold injuries. These principles and risks apply equally to both men and women.

(2) *Type of combat operation.* Defense, delaying, observation-post, and sentinel duties do create to a greater extent—fear, fatigue, dehydration, and lack of nutrition. These factors further increase the soldier's vulnerability to cold injury. Also, a soldier is more likely to receive a cold injury if he is—

- Often in contact with the ground.
- Immobile for long periods, such as while riding in a crowded vehicle.
- Standing in water, such as in a foxhole.
- Out in the cold for days without being warmed.
- Deprived of an adequate diet and rest.
- Not able to take care of his personal hygiene.

(3) *Clothing.* The soldier should wear several layers of loose clothing. He should dress as lightly as possible consistent with the weather to reduce the danger of excessive perspiration and subsequent chilling. It is better for the body to be slightly cold and generating heat than excessively warm and sweltering toward dehydration. He should

remove a layer or two of clothing before doing any hard work. He should replace the clothing when work is completed. Most cold injuries result from soldiers having too few clothes available when the weather suddenly turns colder. Wet gloves, shoes, socks, or any other wet clothing add to the cold injury process.

CAUTION

In a chemical environment DO NOT take off protective chemical gear.

(4) *Physical makeup.* Physical fatigue contributes to apathy, which leads to inactivity, personal neglect, carelessness, and reduced heat production. In turn, these increase the risk of cold injury. Soldiers with prior cold injuries have a higher-than-normal risk of subsequent cold injury, not necessarily involving the part previously injured.

(5) *Psychological factor.* Mental fatigue and fear reduces the body's ability to rewarm itself and thus increases the incidence of cold injury. The feelings of isolation imposed by the environment are also stressful. Depressed and/or unresponsive soldiers are also vulnerable because they are less active. These soldiers tend to be careless about precautionary measures, especially warming activities, when cold injury is a threat.

b. *Signs/Symptoms.* Once a soldier becomes familiar with the factors that contribute to cold injury, he must learn to recognize cold injury signs/symptoms.

(1) Many soldiers suffer cold injury without realizing what is happening to them. They may be cold and generally uncomfortable. These soldiers *often do not notice* the injured part because it is *already numb* from the cold.

(2) Superficial cold injury usually can be *detected by numbness,* tingling, or "pins and needles" sensations. These signs/symptoms often can be relieved simply by loosening boots or other clothing and by exercising to improve circulation. In more serious cases involving deep cold injury, the soldier often is not aware that there is a problem *until the affected part feels* like a stump or block of wood.

(3) Outward signs of cold injury include *discoloration* of the skin at the site of injury. In light-skinned persons, the skin first reddens and then becomes pale or waxy white. In dark-skinned persons, grayness in the skin is usually evident. An injured foot or hand *feels cold* to the

touch. *Swelling* may be an indication of deep injury. Also note that blisters may occur after rewarming the affected parts. *Soldiers* should work in pairs—buddy teams—to *check each other* for signs of discoloration and other symptoms. Leaders should also be alert for signs of cold injuries.

c. Treatment Considerations. First aid for cold injuries depends on whether they are superficial or deep. Cases of superficial cold injury can be adequately treated by warming the affected part using body heat. *For example,* this can be done by covering cheeks with hands, putting fingertips under armpits, or placing feet under the clothing of a buddy next to his belly. The injured part should NOT be massaged, exposed to a fire or stove, rubbed with snow, slapped, chafed, or soaked in cold water. Walking on injured feet should be avoided. Deep cold injury (frostbite) is very serious and requires more aggressive first aid to avoid or to minimize the loss of parts of the fingers, toes, hands, or feet. The sequence for treating cold injuries depends on whether the condition is life-threatening. That is, **PRIORITY** is given to removing the casualty from the cold. Other-than-cold injuries are treated either simultaneously while waiting for evacuation to a medical treatment facility or while en route to the facility.

NOTE

The injured soldier should be evacuated at once to a place where the affected part can be rewarmed under medical supervision.

d. Conditions Caused by Cold. Conditions caused by cold are chilblain, immersion syndrome (immersion foot/trench foot), frostbite, snow blindness, dehydration, and hypothermia.

(1) *Chilblain.*

- *Signs/Symptoms.* Chilblain is caused by repeated prolonged exposure of bare skin at temperatures from 60°F, to 32°F, or 20°F for acclimated, dry, unwashed skin. The area may be acutely swollen, red, tender, and hot with itchy skin. There may be no loss of skin tissue in untreated cases but continued exposure may lead to infected, ulcerated, or bleeding lesions.

- *Treatment.* Within minutes, the area usually responds to locally applied body heat. Rewarm the affected part by applying firm steady pressure with your hands, or placing the affected part under your arms or against the stomach of a buddy. DO NOT rub or

massage affected areas. Medical personnel should evaluate the injury, because signs and symptoms of tissue damage may be slow to appear.

- *Prevention.* Prevention of chilblain depends cm basic cold injury prevention methods. Caring for and wearing the uniform properly and staying dry (as far as conditions permit) are of immediate importance.

(2) *Immersion syndrome (immersion foot/trench foot).* Immersion foot and trench foot are injuries that result from fairly long exposure of the feet to wet conditions at temperatures from approximately 50° to 32°F. Inactive feet in damp or wet socks and boots, or tightly laced boots which impair circulation are even more susceptible to injury. This injury can be very serious; it can lead to loss of toes or parts of the feet. If exposure of the feet has been prolonged and severe, the feet may swell so much that pressure closes the blood vessels and cuts off circulation. Should an immersion injury occur, dry the feet thoroughly; and evacuate the casualty to a medical treatment facility by the fastest means possible.

- *Signs/Symptoms.* At first, the parts of the affected foot are cold and painless, the pulse is weak, and numbness may be present. Second, the parts may feel hot, and burning and shooting pains may begin. In later stages, the skin is pale with a bluish cast and the pulse decreases. Other signs/symptoms that may follow are blistering, swelling, redness, heat, hemorrhages (bleeding), and gangrene.

- *Treatment.* Treatment is required for all stages of immersion syndrome injury. Rewarm the injured part gradually by exposing it to warm air. DO NOT massage it. DO NOT moisten the skin and DO NOT apply heat or ice. Protect it from trauma and secondary infections. Dry, loose clothing or several layers of warm coverings are preferable to extreme heat. Under no circumstances should the injured part be exposed to an open fire. Elevate the injured part to relieve the swelling. Evacuate the casualty to a medical treatment facility as soon as possible. When the part is rewarmed, the casualty often feels a burning sensation and pain. Symptoms may persist for days or weeks even after rewarming.

- *Prevention.* Immersion syndrome can be prevented by good hygienic care of the feet and avoiding moist conditions for prolonged periods. Changing socks at least daily (depending on environmental conditions) is also a preventive measure. Wet socks can be air dried, then can be placed inside the shirt to warm them prior to putting them on.

(3) *Frostbite.* Frostbite is the injury of tissue caused from exposure to cold, usually below 32°F depending on the windchill factor, duration of exposure, and adequacy of protection. Individuals with a history of cold injury are likely to be more easily affected for an indefinite period. The body parts most easily frostbitten are the cheeks, nose, ears, chin, forehead, wrists, hands, and feet. Proper treatment and management depend upon accurate diagnosis. Frostbite may involve only the skin (superficial), or it may extend to a depth below the skin (deep). Deep frostbite is very serious and requires more aggressive first aid to avoid or to minimize the loss of parts of the fingers, toes, hands, or feet.

WARNING

Casualty should be continually monitored for development of conditions which may require the performance of necessary basic lifesaving measures, such as clearing the airway, performing mouth-to-mouth resuscitation, preventing shock, and/or bleeding control.

- *Progressive signs/symptoms (081-831-1009).*

o *Loss of* sensation, or numb feeling in any par of the body.

o *Sudden blanching* (whitening) of the skin of the affected part, followed by a momentary "tingling" sensation.

o *Redness of* skin in light-skinned soldiers; grayish coloring in dark-skinned individuals.

o *Blister.*

o *Swelling or* tender areas.

o *Loss of* previous sensation of pain in affected area.

o *Pale, yellowish,* waxy-looking skin.

o *Frozen tissue* that feels solid (or wooden) to the touch.

CAUTION

Deep frostbite is a very serious injury and requires immediate first aid and subsequent medical treatment to avoid or minimize loss of body parts.

- *Treatment (081-831-1009).*

o *Face, ears, and nose.* Cover the casualty's affected area with his and/or your bare hands until sensation and color return.

o *Hands.* Open the casualty's field jacket and shirt. (In a chemical environment never remove the clothing.) Place the affected hands under the casualty's armpits. Close the field jacket and shirt to prevent additional exposure.

o *Feet.* Remove the casualty's boots and socks if he does not need to walk any further to receive additional treatment. (Thawing the casualty's feet and forcing him to walk on them will cause additional pain/injury.) Place the affected feet under clothing and against the body of another soldier.

WARNING *(081-831-1009)*

DO NOT attempt to thaw the casualty's feet or other seriously frozen areas if he will be required to walk or travel to receive further treatment. The casualty should avoid walking, if possible, because there is less danger in walking while the feet are frozen than after they have been thawed. Thawing in the field increases the possibilities of infection, gangrene, or other injury.

NOTE

Thawing may occur spontaneously during transportation to the medical facility; this cannot be avoided since the body in general must be kept warm.

In all of the above areas, ensure that the casualty is kept warm and that he is covered (to avoid further injury). *Seek medical treatment as soon as*

possible. Reassure the casualty, protect the affected area from further injury by covering it lightly with a blanket or any dry clothing, and seek shelter out of the wind. Remove/minimize constricting clothing and increase insulation. Ensure that the casualty exercises as much as possible, avoiding trauma to the injured part, and is prepared for pain when thawing occurs. Protect the frostbitten part from additional injury. DO NOT rub the injured part with snow or apply cold water soaks. DO NOT warm the part by massage or exposure to open fire because the frozen part may be burned due to the lack of feeling. DO NOT use ointments or other medications. DO NOT manipulate the part in any way to increase circulation. DO NOT allow the casualty to use alcohol or tobacco because this reduces the body's resistance to cold. Remember, when freezing extends to a depth below the skin, it involves a much more serious injury. Extra care is required to reduce or avoid the chances of losing all or part of the toes or feet. This also applies to the fingers and hands.

- *Prevention.* Prevention of frostbite or any cold injury depends on adequate nutrition, hot meals and warm fluids. Other cold injury preventive factors are proper clothing and maintenance of general body temperature. Fatigue, dehydration, tobacco, and alcoholic beverages should be avoided.

o Sufficient clothing must be worn for protection against cold and wind. Layers of clothing that can be removed and replaced as needed are the most effective. Every effort must be made to keep clothing and body as dry as possible. This includes avoiding any excessive perspiration by removing and replacing layers of clothing. Socks should be changed whenever the feet become moist or wet. Clothing and equipment should be properly fitted to avoid any interference with blood circulation. Improper blood circulation reduces the amount of heat that reaches the extremities. Tight fitting socks, shoes, and hand wear are especially hazardous in very cold climates. The face needs extra protection against high winds, and the ears need massaging from time to time to maintain circulation. Hands may be used to massage and warm the face. By using the buddy system, individuals can watch each other's face for signs of frostbite to detect it early and keep tissue damage to a minimum. A mask or headgear tunneled in front of the face guards against direct wind injury. Fingers and toes should be exercised to keep them warm and to detect any numbness. Wearing windproof leather gloves or mittens and avoiding kerosene, gasoline, or alcohol on the skin are also preventive measures. Cold metal should not be touched with bare skin; doing so could result in severe skin damage.

o Adequate clothing and shelter are also necessary during periods of inactivity.

(4) *Snow blindness.* Snow blindness is the effect that glare from an ice field or snowfield has on the eyes. It is more likely to occur in hazy, cloudy weather than when the sun is shining. Glare from the sun will cause an individual to instinctively protect his eyes. However, in cloudy weather, he may be overconfident and expose his eyes longer than when the threat is more obvious. He may also neglect precautions such as the use of protective eyewear. Waiting until discomfort (pain) is felt before using protective eyewear is dangerous because a deep burn of the eyes may already have occurred.

- *Signs/Symptoms.* Symptoms of snow blindness are a sensation of grit in the eyes with pain in and over the eyes, made worse by eyeball movement. Other signs/symptoms are watering, redness, headache, and increased pain on exposure to light. The same condition that causes snow blindness can cause snowburn of skin, lips, and eyelids. If a snowburn is neglected, the result is the same as a sunburn.

- *Treatment.* First aid measures consist of blindfolding or covering the eyes with a dark cloth which stops painful eye movement. Complete rest is desirable. If further exposure to light is not preventable, the eyes should be protected with dark bandages or the darkest glasses available. Once unprotected exposure to sunlight stops, the condition usually heals in a few days without permanent damage. The casualty should be evacuated to the nearest medical facility.

- *Prevention.* Putting on protective eye wear is essential not only to prevent injury, but to prevent *further* injury if any has occurred. When protective eye wear is not available, an emergency pair can be made from a piece of wood or cardboard cut and shaped to the width of the face. Cut slits for the eyes and attach strings to hold the improvised glasses in place. Slits are made at the point of vision to allow just enough space to see and reduce the risk of injury. Blackening the eyelids and face around the eyes absorbs some of the harmful rays.

(5) *Dehydration.* Dehydration occurs when the body loses too much fluid, salt, and minerals. A certain amount of body fluid is lost through normal body processes. A normal daily intake of food and liquids replaces these losses. When individuals are engaged in any strenuous exercises or activities, an excessive amount of fluid and salt is lost through sweat. This excessive loss creates an imbalance of fluids, and dehydration occurs when fluid and salt are not replaced. It is very important to know that it can be prevented if troops are instructed in its causes, symptoms, and preventive measures. The danger of dehydration is as prevalent in cold regions as it is in hot regions. In *hot weather* the individual is aware of his body losing fluids and salt. He can see, taste, and feel the sweat as it runs down his face, gets into his eyes, and on his lips and tongue, and drips from his body. In *cold weather,* however, it is

extremely difficult to realize that this condition exists. The danger of dehydration in cold weather operations is a serious problem. In cold climates, sweat evaporates so rapidly or is absorbed so thoroughly by layers of heavy clothing that it is rarely visible on the skin. Dehydration also occurs during cold weather operations because drinking is inconvenient. Dehydration will weaken or incapacitate a casualty for a few hours, or sometimes, several days. Because rest is an important part of the recovery process, casualties must take care that limited movement during their recuperative period does not enhance the risk of becoming a cold weather casualty.

- *Signs/Symptoms.* The symptoms of cold weather dehydration are similar to those encountered in heat exhaustion. The mouth, tongue, and throat become parched and dry, and swallowing becomes difficult. The casualty may have nausea with or without vomiting along with extreme dizziness and fainting. The casualty may also feel generally tired and weak and may experience muscle cramps (especially in the legs). Focusing eyes may also become difficult.

- *Treatment.* The casualty should be kept warm and his clothes should be loosened to allow proper circulation. Shelter from wind and cold will aid in this treatment. Fluid replacement, rest, and prompt medical treatment are critical. Medical personnel will determine the need for salt replacement.

- *Prevention.* These general preventive measures apply for both hot and cold weather. Sufficient additional liquids should be consumed to offset excessive body losses of these elements. The amount should vary according to the individual and the type of work he is doing (light, heavy, or very strenuous). Rest is equally important as a preventive measure. Each individual must realize that any work that must be done while bundled in several layers of clothing is extremely exhausting. This is especially true of any movement by foot, regardless of the distance.

(6) *Hypothermia (general cooling).* In intense cold a soldier may become both mentally and physically numb, thus neglecting essential tasks or requiring more time and effort to achieve them. Under some conditions (particularly cold water immersion), even a soldier in excellent physical condition may die in a matter of minutes. The destructive influence of cold on the body is called *hypothermia.* This means bodies lose heat faster than they can produce it. Frostbite may occur without hypothermia when extremities do not receive sufficient heat from central body stores. The reason for this is inadequate circulation and/or inadequate insulation. Nonetheless, hypothermia and frostbite may occur at the same time with exposure to below-freezing temperatures. An example of this is an avalanche accident. Hypothermia

may occur from exposure to temperatures above freezing, especially from immersion in cold water, wet-cold conditions, or from the effect of wind. Physical exhaustion and insufficient food intake may also increase the risk of hypothermia. Excessive use of alcohol leading to unconsciousness in a cold environment can also result in hypothermia. General cooling of the entire body to a temperature below 95°F is caused by continued exposure to low or rapidly dropping temperatures, cold moisture, snow, or ice. Fatigue, poor physical condition, dehydration, faulty blood circulation, alcohol or other drug intoxication, trauma, and immersion can cause hypothermia. Remember, cold affects the body systems slowly and almost without notice. Soldiers exposed to low temperatures for extended periods may suffer ill effects even if they are well protected by clothing.

- *Signs/Symptoms.* As the body cools, there are several stages of progressive discomfort and impairment. A sign/symptom that is noticed immediately is shivering. Shivering is an attempt by the body to generate heat. The pulse is faint or very difficult to detect. People with temperatures around 90°F may be drowsy and mentally slow. Their ability to move may be hampered, stiff, and uncoordinated, but they may be able to function minimally. Their speech may be slurred. As the body temperature drops further, shock becomes evident as the person's eyes assume a glassy state, breathing becomes slow and shallow, and the pulse becomes weaker or absent. The person becomes very stiff and uncoordinated. Unconsciousness may follow quickly. As the body temperature drops even lower, the extremities freeze, and a deep (or core) body temperature (below 85°F) increases the risk of irregular heart action. This irregular heart action or heart standstill can result in sudden death.

- *Treatment.* Except in cases of the most severe hypothermia (marked by coma or unconsciousness, a weak pulse, and a body temperature of approximately 90°F or below), the treatment for hypothermia is directed towards *rewarming the body evenly and without delay.* Provide heat by using a hot water bottle, electric blanket, campfire, or another soldier's body heat. Always call or send for help as soon as possible and protect the casualty immediately with dry clothing or a sleeping bag. Then, move him to a warm place. Evaluate other injuries and treat them. Treatment can be given while the casualty is waiting evacuation or while he is en route. In the case of an accidental breakthrough into ice water, or other hypothermic accident, strip the casualty of wet clothing immediately and bundle him into a sleeping bag. Mouth-to-mouth resuscitation should be started at once if the casualty's breathing has stopped or is irregular or shallow. Warm liquids may be given gradually but must not be forced on an unconscious or semiconscious person because he may choke. The casualty should be transported on a litter because the exertion of walking may aggravate

circulation problems. A physician should immediately treat any hypothermia casualty. *Hypothermia is life-threatening* until normal body temperature has been restored. The treatment of a casualty with *severe* hypothermia is based upon the following principles: stabilize the temperature, attempt to avoid further heat loss, handle the casualty gently, and *evacuate as soon as possible to the nearest medical treatment facility!* Rewarming a severely hypothermic casualty is extremely dangerous in the field due to the great possibility of such complications as rewarming shock and disturbances in the rhythm of the heartbeat.

★ CAUTION

Hypothermia is a *MEDICAL EMERGENCY!* Prompt medical treatment is necessary. Casualties with hypothermic complications should be transported to a medical treatment facility immediately.

CAUTION

The casualty is unable to generate his own body heat. Therefore, merely placing him in a blanket or sleeping bag is not sufficient.

• *Prevention.* Prevention of hypothermia consists of all actions that will avoid rapid and uncontrollable loss of body heat. Individuals should be properly equipped and properly dressed (as appropriate for conditions and exposure). Proper diet, sufficient rest, and general principles apply. Ice thickness must be tested before river or lake crossings. Anyone departing a fixed base by aircraft, ground vehicle, or foot must carry sufficient protective clothing and food reserves to survive during unexpected weather changes or other unforeseen emergencies. Traveling alone is never safe. Expected itinerary and arrival time should be left with responsible parties before any departure in severe weather. Anyone living in cold regions should learn how to build expedient shelters from available materials including snow.

e. Table. See Table 5-2 for further information.

Table 5-2. Cold and Wet Injuries (081-831-1009)

INJURIES	SIGNS/SYMPTOMS	FIRST AID
Chilblain	Red, swollen, hot, tender, itching skin. Continued exposure may lead to infected (ulcerated or bleeding) skin lesions.	1. Area usually responds to locally applied rewarming (body heat). 2. DO NOT rub or massage area. 3. Seek medical treatment.
Immersion foot/ Trench foot	Affected parts are cold, numb, and painless. Parts may then be hot, with burning and shooting pains. Advanced stage: skin pale with bluish cast; pulse decreases; blistering, swelling, heat, hemorrhages, and gangrene may follow.	1. Gradual rewarming by exposure to warm air. 2. DO NOT massage or moisten skin. 3. Protect affected parts from trauma. 4. Dry feet thoroughly, avoid walking. 5. Seek medical treatment.
Frostbite	Loss of sensation, or numb feeling in any part of the body. Sudden blanching (whitening) of the skin of the affected part, followed by a momentary "tingling" sensation. Redness of skin in light-skinned soldiers; grayish coloring in dark-skinned individuals. Blisters. Swelling or tender areas. Loss of previous sensation of pain in affected area. Pale,	1. Warm the area at the first sign of frostbite, using firm, steady pressure of hand, underarm or abdomen. 2. Face, ears, nose—cover area with hands (casualty's own or buddy's). 3. Hand(s)—open field jacket and place casualty's hand(s) against body, then close jacket to prevent heat loss. 4. Feet—casualty's boots/socks removed and exposed feet placed under clothing and against body of another soldier. 5. *Warning:* Do not attempt to thaw the casualty's feet or other seriously frozen areas if he will be required

Table 5-2. Continued.

Frostbite *Continued.*	yellowish, waxy-looking skin. Frozen tissue that feels solid (or wooden) to the touch.	to walk or travel to a medical center in order to receive additional treatment. The possibility of injury from walking is less when the feet are frozen than after they have been thawed. (However, if possible, avoid walking.) Thawing in the field increases the possibility of infection, gangrene, or injury. 6. Loosen or remove constricting clothing and remove any jewelry. 7. Increase insulation (cover with blanket or other dry material). Ensure casualty exercises as much as possible, avoiding trauma to injured part.
Snow Blindness	Eyes may feel scratchy. Watering, redness, headache, and increased pain with exposure to light can occur.	1. Cover the eyes with a dark cloth. 2. Seek medical treatment.
Dehydration	Similar to heat exhaustion. See Table 5-1.	1. Keep warm, loosen clothes. 2. Casualty needs fluid replacement, rest, and prompt medical treatment.
Hypothermia	Casualty is cold. Shivering stops. Core temperature is low. Consciousness may be altered. Uncoordinated movements may occur. Shock and coma may result as	*Mild Hypothermia* 1. Rewarm body evenly and without delay. (Need to provide heat source; casualty's body unable to generate heat). 2. Keep dry, protect from elements.

Table 5-2. Continued.

INJURIES	SIGNS/SYMPTOMS	FIRST AID
Hypothermia *Continued.*	body temperature drops.	3. Warm liquids may be given gradually (to conscious casualties only). ★ 4. Seek medical treatment immediately! *Severe Hypothermia* 1. Stabilize the temperature. 2. Attempt to avoid further heat loss. 3. Handle the casualty gently. 4. Evacuate to the nearest medical treatment facility as soon as possible.

★**CAUTION:** Hypothermia is a *MEDICAL EMERGENCY!* Prompt medical treatment is necessary.

NOTES