

CHAPTER 3

FIRST AID EQUIPMENT, SUPPLIES, RESCUE, AND TRANSPORTATION

This chapter will discuss first aid equipment and supplies, and the rescue and transportation of the injured patient. As a Hospital Corpsman, you will be expected to recognize the uses and application procedures for dressings and bandages, and to be able to identify the protective equipment needed in specific emergencies, along with where and when to use it.

In this chapter, you will learn the phases of a rescue operation and the stages of extrication. You will also learn the precautionary steps that must be taken in special rescue situations. You will learn to recognize the different patient-moving devices and lifting techniques. Additionally, this chapter will familiarize you with the various forms of emergency transportation, and you will learn to identify essential basic life support supplies on Navy ambulances. Finally, this chapter will give you the preparatory, en route, and turnover procedures for patients being transported to medical treatment facilities.

FIRST AID EQUIPMENT AND SUPPLIES

LEARNING OBJECTIVE: *Identify initial equipment and supply needs.*

In a first aid situation, the Corpsman must always be ready to improvise. In many field emergency situations, standard medical supplies and equipment may not be immediately available, or they may run out. When medical supplies and equipment are available, they will probably be found in an ambulance or in the field medical Unit One Bag.

Navy ambulances are stocked in accordance with BUMEDINST 6700.42, *Ambulance Support*. Table 3-1 lists equipment currently required for EMT-Basic level ambulances. Table 3-2 lists the contents of an emergency bag that a Hospital Corpsman might find in an ambulance.

When assigned to Marine Corps Units, Hospital Corpsmen carry their medical equipment and supplies in a special bag. It is referred to as a “Unit One Bag.”

The Unit One Bag is made of nylon, weighs about 9 pounds, has an adjustable carrying strap, and contains four strong compartments. The contents of the Unit One Bag are listed below in table 3–3.

Unique operational requirements or command decisions may modify the make-up of these lists. As a Corpsman, it is up to you to be familiar with the emergency medical equipment at the command, since a call may come at a moment’s notice and you may have to use these items to help save or sustain a life.

DRESSINGS AND BANDAGES

LEARNING OBJECTIVE: *Recognize the uses and application procedures for dressings and bandages.*

There are many different types of dressings and bandages. You should be familiar with the various standard dressings and bandages, their respective functions, and their proper application in first-aid and emergency situations.

DEFINITION OF A DRESSING

A dressing is a sterile pad or compress (usually made of gauze or cotton wrapped in gauze) used to cover wounds to control bleeding and/or prevent further contamination. Dressings should be large enough to cover the entire area of the wound and to extend at least 1" in every direction beyond the edges. If the dressing is not large enough, the edges of the wound are almost certain to become contaminated. Figure 3–1 shows several commonly used styles of dressings.

Any part of a dressing that is to come in direct contact with a wound should be absolutely sterile (that is, free from microorganisms). The dressings that you will find in first aid kits have been sterilized. However, if you touch them with your fingers, your clothes, or any other unsterile object, they are no longer sterile. If you drag a dressing across the victim’s skin or allow it

Table 3-1.—Essential Equipment for Ambulance ETM-Basic Level

ESSENTIAL EQUIPMENT FOR AMBULANCES EMT-BASIC LEVEL		
General Category of Equipment	Detailed Breakdown	Comments
Patient transfer litter	<ul style="list-style-type: none"> • Collapsible-wheeled litter 	
Ventilation and airway equipment	<ul style="list-style-type: none"> • Portable suction apparatus • Portable fixed oxygen equipment • Oxygen administration equipment • Bag-valve mask • Airways • Respirator (optional) 	<ul style="list-style-type: none"> • Wide-bore tubing, rigid pharyngeal curved suction cup • Variable flow regulator, humidifier (on fixed equipment) • Adequate length tubing, masks (adult, child, and infant sizes; transparent, non-rebreathing, venturi and valveless nasal prongs) • Hand-operated, self-reexpanding bag (adult and infant sizes, ≥0.85), accumulator (FiO₂, 0.9), clear mask (adult, child, and infant sizes), valve (clear, easily cleanable, operable in cold weather) • Nasopharyngeal, oropharyngeal (adult, child, and infant sizes) • Volume-cycled valve, on-off operation, 100% oxygen, 40-50 psi pressure
Immobilization devices (splints)	<ul style="list-style-type: none"> • Traction (adult and pediatric sizes) • Extremity immobilization devices • • Backboards (long, short, and clamshell) 	<ul style="list-style-type: none"> • Lower extremity, limb-support slings, padded ankle hitch, padded pelvic support, traction strap • Joint above and joint below fracture, rigid support, appropriate material (cardboard, metal, pneumatic, wood, plastic, etc.) • Joint above and joint below fracture site. Chin strap (should not use for head immobilization), hand holds for moving patient, short (extrication: head-to-pelvis length), long (transport: head-to-feet length)
Bandages	<ul style="list-style-type: none"> • Burn sheets • Triangle bandages • Dressings • Roller bandages <ul style="list-style-type: none"> — Soft — Elastic • Vaseline gauze • Adhesive tape 	<ul style="list-style-type: none"> • Two clean (not sterile) • Eight, three safety pins each • Sterile, large and small • — Sterile, 4" or larger — Nonsterile, 4" or larger • Sterile, 3" × 8" or larger • 2" or larger
Pneumatic Antishock Garment (MAST)	<ul style="list-style-type: none"> • Compartmentalized (legs and abdomen separate), control valves (closed/open), inflation pump, lower leg to lower rib cage (does not include chest) 	
Obstetrical equipment	<ul style="list-style-type: none"> • Sterile obstetrical kit • Aluminum foil roll 	<ul style="list-style-type: none"> • Towels, 4" × 4" dressing, umbilical tape type, bulb syringe, clamps for cords, sterile gloves, blanket • Enough to cover a newborn
Miscellaneous	<ul style="list-style-type: none"> • Sphygmomanometer • Stethoscope • Heavy bandage scissors for cutting clothing, belts, boots, etc. • Mouth gags (commercial or tongue blades covered with gauze) • C-collar • Flashlight 	
Radio communication	<ul style="list-style-type: none"> • Two-way communication (EMT to physician) • Portable cellular telephone (optional) 	<ul style="list-style-type: none"> • Radio UHF (ultra-high frequency) or VHF (very-high frequency)

Table 3-2.—Ambulance Emergency Bag Contents

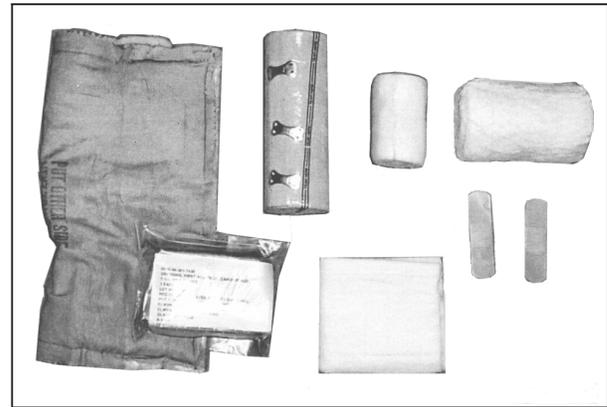
AMBULANCE EMERGENCY BAG CONTENTS		
Regular drip IV tubing	Ambu bag	Syrup of Ipecac
Mini drip IV tubing	Trach adaptor	Ace® wrap
IV extension tubing	Suction tubing	Klings®
19-gauge butterflies	Straight & Y-connector	Arm slings
18-gauge Medicut®	Toomey syringe	Safety pins
16-gauge Medicut®	10cc syringe	Tongue blades
Tourniquet	20-gauge needles	Tape
Adult oxygen mask	Alcohol swabs	Stethoscope
Nasal cannula	Examination gloves	4 x 4's
Oxygen tubing	Sodium Chloride ampules	Lubricant
Airways (various sizes)	Ammonia ampules	Grease pencil

Table 3-3.—Unit One Bag Contents

UNIT ONE BAG CONTENTS	
One roll wire fabric, 5" x 36"	One tourniquet
Two bottles of aspirin, 324 mg, 100s	One pair scissors, bandage
Three packages of morphine inj., 1/4 g, 5s	Six packages of plastic strip bandages, 6s
One bottle tetracaine hydrochloride ophthalmic sol.	Three bottles povidone-iodine solution, 1/2 fl oz
One airway, plastic, adult/child	One thermometer, oral
Two packages atropine inj., 12s	One card of safety pins, medium, 12s
Two muslin triangular bandages	Two books field medical cards
Two medium battle dressings, 7 1/4" x 8"	One surgical instrument set, minor surgery
Eight small battle dressings, 4" x 7"	One pencil, black lead, mechanical
One roll adhesive tape, 3 in x 5 yds	Two packages gauze, rolled, 3 in x 5 yds

to slip after it is in place, the dressing is no longer sterile.

Should an emergency arise when a sterile dressing is not available, the cleanest cloth at hand may be used—a freshly laundered handkerchief, towel, or shirt, for instance. Unfold these materials carefully so that you do not touch the part that goes next to the skin. Always be ready to improvise when necessary, but never put materials directly in contact with wounds if



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Figure 3-1.—Commonly used styles of dressings.

those materials are likely to stick to the wound, leave lint, or be difficult to remove.

DEFINITION OF A BANDAGE

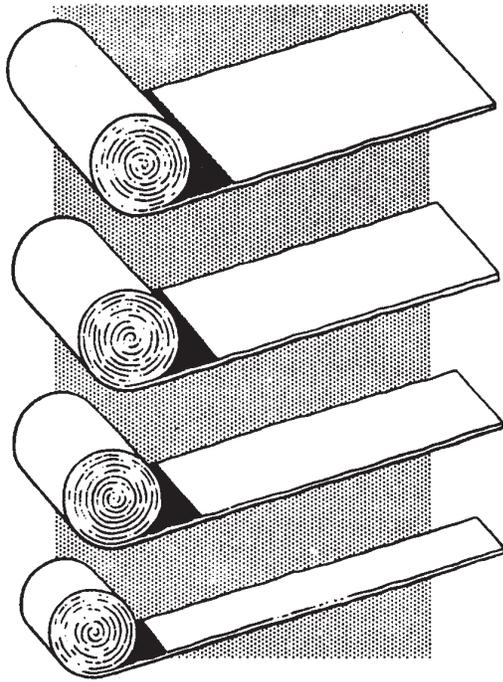
Standard bandages are made of gauze or muslin and are used over a sterile dressing to secure the dressing in place, to close off its edge from dirt and germs, and to create pressure on the wound and control bleeding. A bandage can also support an injured part or secure a splint. The most common types of bandages are the roller and triangular bandages.

Roller Bandage

The roller bandage, shown in figure 3-2, consists of a long strip of material (usually gauze, muslin, or elastic) that is wound into a cylindrical shape. Roller bandages come in various widths and lengths. Most of the roller bandages in the first aid kits have been sterilized, so pieces may be cut off and used as compresses in direct contact with wounds. If you use a piece of roller bandage in this manner, you must be careful not to touch it with your hands or with any other unsterile object.

GENERAL APPLICATION.—In applying a roller bandage, hold the roll in the right hand so that the loose end is on the bottom; the outside surface of the loose or initial end is next applied to and held on the body part by the left hand. The roll is then passed around the body part by the right hand, which controls the tension and application of the bandage. Two or three of the initial turns of a roller bandage should overlie each other to properly secure the bandage (see figure 3-3).

In applying the turns of the bandage, it is often necessary to transfer the roll from one hand to the



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Figure 3-2.—Roller bandages.

other. Bandages should be applied evenly, firmly, but not too tightly. Excessive pressure may cause interference with the circulation and may lead to disastrous consequences. In bandaging an extremity, it is advisable to leave the fingers or toes exposed so the circulation of these parts may be readily observed. It is likewise safer to apply a large number of turns of a bandage, rather than to depend upon a few turns applied too firmly to secure a compress.

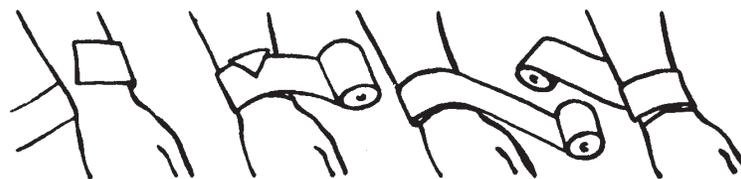
In applying a wet bandage, or one that may become wet, you must allow for shrinkage. The turns of a bandage should completely cover the skin, as any uncovered areas of skin may become pinched between the turns, with resulting discomfort. In bandaging any extremity, it is advisable to include the whole member (arm or leg, excepting the fingers or toes) so that uniform pressure may be maintained throughout. It is also desirable in bandaging a limb that the part is

placed in the position it will occupy when the dressing is finally completed, as variations in the flexion and extension of the part will cause changes in the pressure of certain parts of the bandage.

The initial turns of a bandage on an extremity (including spica bandages of the hip and shoulder) should be applied securely, and, when possible, around the part of the limb that has the smallest circumference. Thus, in bandaging the arm or hand, the initial turns are usually applied around the wrist, and in bandaging the leg or foot, the initial turns are applied immediately above the ankle.

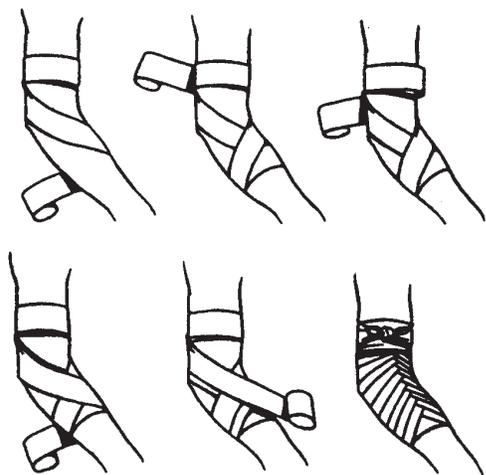
The final turns of a completed bandage are usually secured in the same manner as the initial turns, by employing two or more overlying circular turns. As both edges of the final circular turns are exposed, they should be folded under to present a neat, cufflike appearance. The terminal end of the completed bandage is turned under and secured to the final turns by either a safety pin or adhesive tape. When these are not available, the end of the bandage may be split lengthwise for several inches, and the two resulting tails may be secured around the part by tying.

ROLLER BANDAGE FOR ELBOW.—A spica or figure-eight type of bandage is used around the elbow joint to retain a compress in the elbow region and to allow a certain amount of movement. Flex the elbow slightly (if you can do so without causing further pain or injury), or anchor a 2- or 3-inch bandage above the elbow and encircle the forearm below the elbow with a circular turn. Continue the bandage upward across the hollow of the elbow to the starting point. Make another circular turn around the upper arm, carry it downward, repeating the figure-eight procedure, and gradually ascend the arm. Overlap each previous turn about two-thirds of the width of the bandage. Secure the bandage with two circular turns above the elbow, and tie. To secure a dressing on the tip of the elbow, reverse the procedure and cross the bandage in the back (fig. 3-4).



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Figure 3-3.—Applying a roller bandage.



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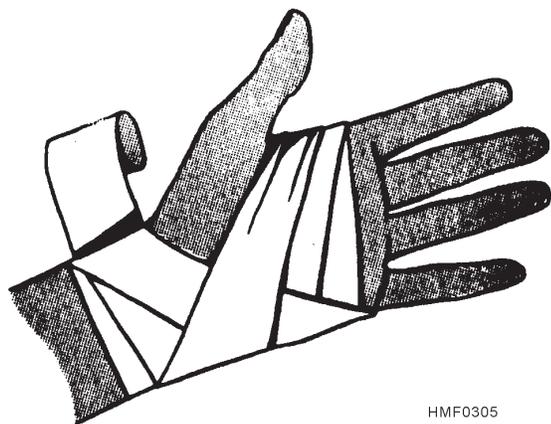
Figure 3-4.—Roller bandage for the elbow.

ROLLER BANDAGE FOR HAND AND WRIST.

—For the hand and wrist, a figure-eight bandage is ideal. Anchor the dressing, whether it is on the hand or wrist, with several turns of a 2- or 3-inch bandage. If on the hand, anchor the dressing with several turns and continue the bandage diagonally upward and around the wrist and back over the palm. Make as many turns as necessary to secure the compress properly (fig. 3-5).

ROLLER BANDAGE FOR ANKLE AND FOOT.

—The figure-eight bandage is also used for dressings of the ankle, as well as for supporting a sprain. While keeping the foot at a right angle, start a 3-inch bandage around the instep for several turns to anchor it. Carry the bandage upward over the instep and around behind the ankle, forward, and again across the instep and down under the arch, thus completing one figure-eight. Continue the figure-eight turns,



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Figure 3-5.—Roller bandage for the hand and wrist.

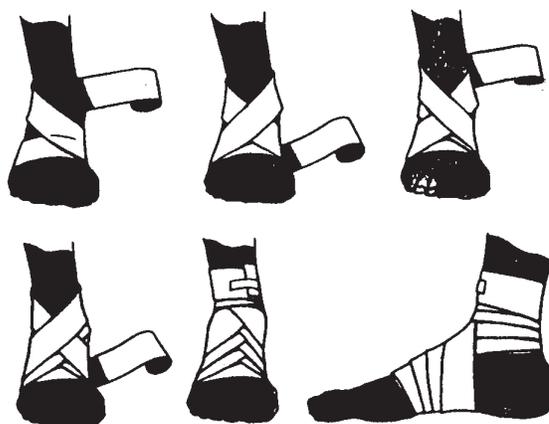
overlapping one-third to one-half the width of the bandage and with an occasional turn around the ankle, until the compress is secured or until adequate support is obtained (fig. 3-6).

ROLLER BANDAGE FOR HEEL.

—The heel is one of the most difficult parts of the body to bandage. Place the free end of the bandage on the outer part of the ankle and bring the bandage under the foot and up. Then carry the bandage over the instep, around the heel, and back over the instep to the starting point. Overlap the lower border of the first loop around the heel and repeat the turn, overlapping the upper border of the loop around the heel. Continue this procedure until the desired number of turns is obtained, and secure with several turns around the lower leg (fig. 3-7).

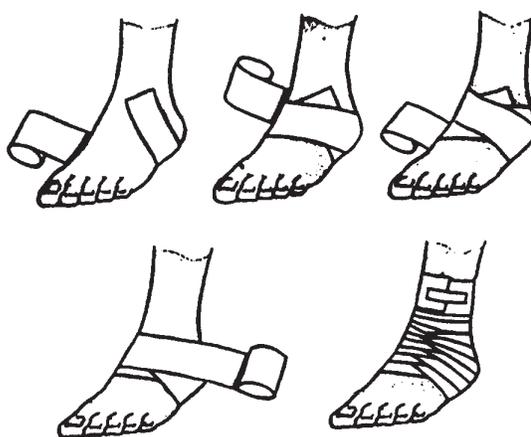
ROLLER BANDAGE FOR ARM AND LEG.

—The spiral reverse bandage must be used to cover wounds of the forearms and lower extremities;



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Figure 3-6.—Roller bandage for the ankle and foot.



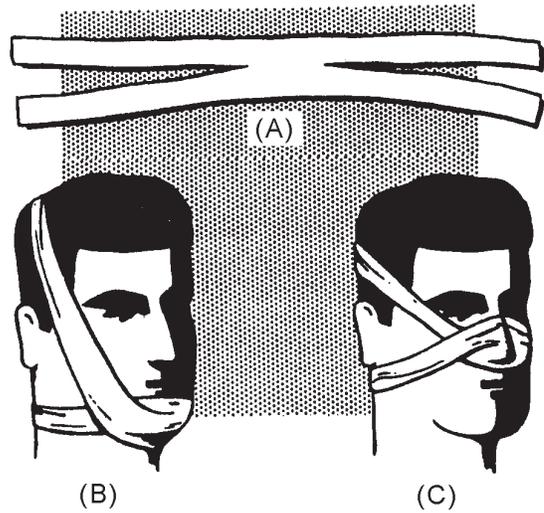
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Figure 3-7.—Roller bandage for the heel.

only such bandages can keep the dressing flat and even. Make two or three circular turns around the lower and smaller part of the limb to anchor the bandage and start upward, going around making the reverse laps on each turning, overlapping about one-third to one-half the width of the previous turn. Continue as long as each turn lies flat. Continue the spiral and secure the end when completed (fig. 3-8).

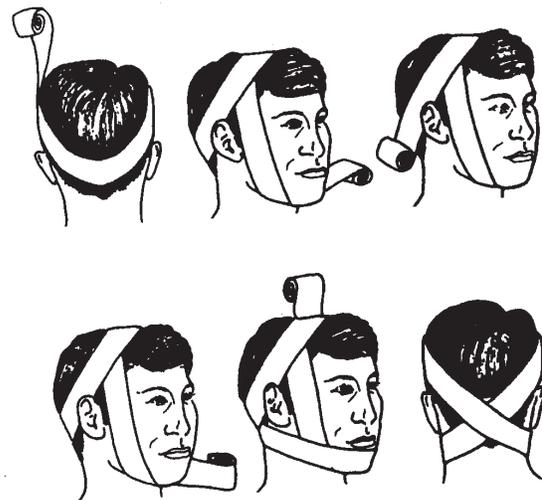
FOUR-TAILED BANDAGE.—A piece of roller bandage may be used to make a four-tailed bandage. The four-tailed bandage is good for bandaging any protruding part of the body because the center portion of the bandage forms a smoothly fitting pocket when the tails are crossed over. This type of bandage is created by splitting the cloth from each end, leaving as large a center area as necessary. Figure 3-9A shows a bandage of this kind. The four-tailed bandage is often used to hold a compress on the chin, as shown in figure 3-9B, or on the nose, as shown in figure 3-9C.

BARTON BANDAGE.—The Barton bandage is frequently used for fractures of the lower jaw and to retain compresses to the chin. As in the progressive steps illustrated in figure 3-10, the initial end of the roller bandage is applied to the head, just behind the right mastoid process. The bandage is then carried under the bony prominence at the back of the head, upward and forward back of the left ear, obliquely across the top of the head. Next bring the bandage downward in front of the right ear. Pass the bandage obliquely across the top of the head, crossing the first turn in the midline of the head, and then backward and downward to the point of origin behind the right mastoid. Now carry the bandage around the back of the



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Figure 3-9.—Four-tailed bandages: A. Four-tailed bandage; B. Four-tailed bandage applied to chin; C. Four-tailed bandage applied to nose.



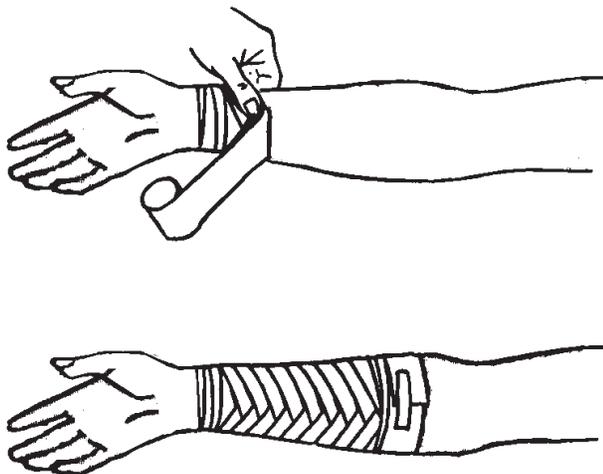
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Figure 3-10.—Barton bandage.

head under the left ear, around the front of the chin, and under the right ear to the point of origin. This procedure is repeated several times, each turn exactly overlaying the preceding turn. Secure the bandage with a pin or strip of adhesive tape at the crossing on top of the head.

Triangular Bandage

Triangular bandages are usually made of muslin. They are made by cutting a 36- to 40-inch square of a piece of cloth and then cutting the square diagonally, thus making two triangular bandages (in sterile packs on the Navy's medical stock list). A smaller bandage



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Figure 3-8.—Roller bandage for the arm or leg.

may be made by folding a large handkerchief diagonally. The longest side of the triangular bandage is called the base; the corner directly opposite the middle of the base is called the point; and the other two corners are called ends (fig. 3-11).

The triangular bandage is useful because it can be folded in a variety of ways to fit almost any part of the body. Padding may be added to areas that may become uncomfortable.

TRIANGULAR BANDAGE FOR HEAD.—

This bandage is used to retain compresses on the forehead or scalp. Fold back the base about 2 inches to make a hem. Place the middle of the base on the forehead, just above the eyebrows, with the hem on the outside. Let the point fall over the head and down over the back of the head. Bring the ends of the triangle around the back of the head above the ears, cross them over the point, carry them around the forehead, and tie

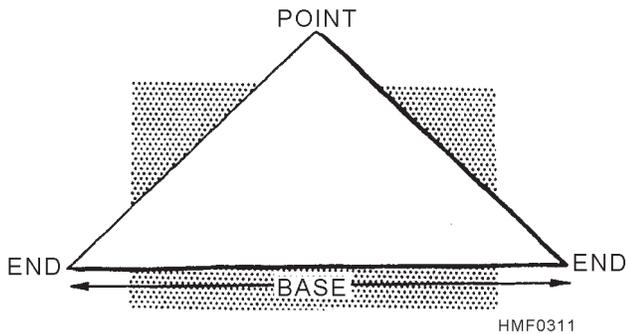


Figure 3-11.—Triangular bandage.

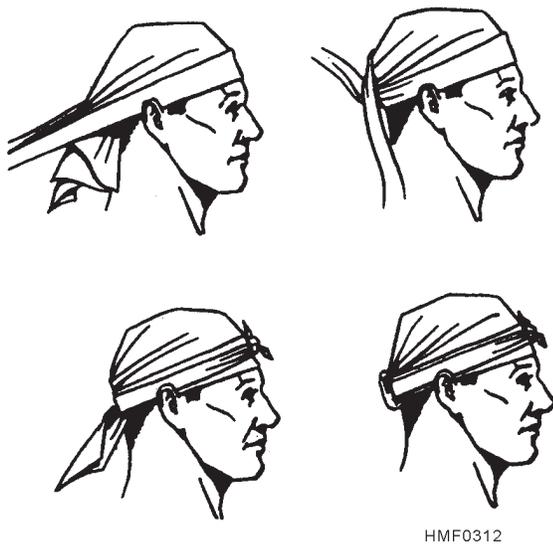


Figure 3-12.—Triangular bandage for the head.

in a SQUARE KNOT. Hold the compress firmly with one hand, and, with the other, gently pull down the point until the compress is snug; then bring the point up and tuck it over and in the bandage where it crosses the back part of the head. Figure 3-12 shows the proper application of a triangular bandage for the head.

TRIANGULAR BANDAGE FOR SHOULDER.—

Cut or tear the point, perpendicular to the base, about 10 inches. Tie the two points loosely around the patient's neck, allowing the base to drape down over the compress on the injured side. Fold the base to the desired width, grasp the end, and fold or roll the sides toward the shoulder to store the excess bandage. Wrap the ends snugly around the upper arm, and tie on the outside surface of the arm. Figure 3-13 shows the proper application of a triangular bandage for the shoulder.

TRIANGULAR BANDAGE FOR CHEST.—

Cut or tear the point, perpendicular to the base, about 10 inches. Tie the two points loosely around the patient's neck, allowing the bandage to drape down over the chest. Fold the bandage to the desired width, carry the ends around to the back, and secure by tying. Figure 3-14 shows the proper application of a triangular bandage for the chest.

TRIANGULAR BANDAGE FOR HIP OR BUTTOCK.—

Cut or tear the point, perpendicular to the base, about 10 inches. Tie the two points around the thigh on the injured side. Lift the base up to the waistline, fold to the desired width, grasp the ends, fold or roll the sides to store the excess bandage, carry the ends around the waist, and tie on the opposite side of the body. Figure 3-15 shows the proper application of a triangular bandage for the hip or buttock.

TRIANGULAR BANDAGE FOR SIDE OF CHEST.—

Cut or tear the point, perpendicular to the base, about 10 inches. Place the bandage, points up, under the arm on the injured side. Tie the two points on top of the shoulder. Fold the base to the desired width, carry the ends around the chest, and tie on the opposite side. Figure 3-16 shows the proper application of a triangular bandage for the side of the chest.

TRIANGULAR BANDAGE FOR FOOT OR HAND.—

This bandage is used to retain large compresses and dressings on the foot or the hand. **For the foot:** After the compresses are applied, place the foot in the center of a triangular bandage and carry the point over the ends of the toes and over the upper side of the foot to the ankle. Fold in excess bandage at the side of the foot, cross the ends, and tie in a square knot

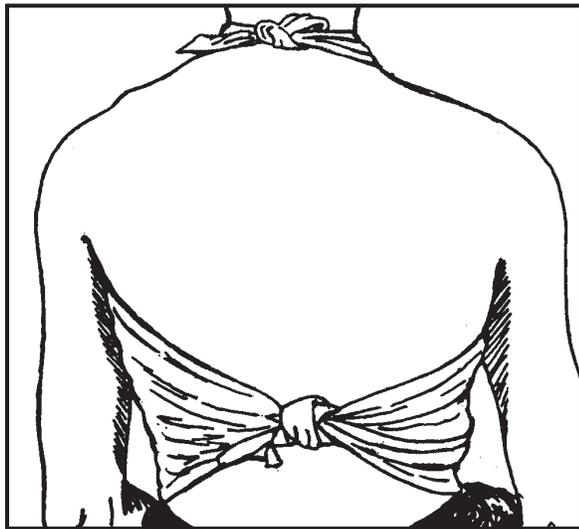
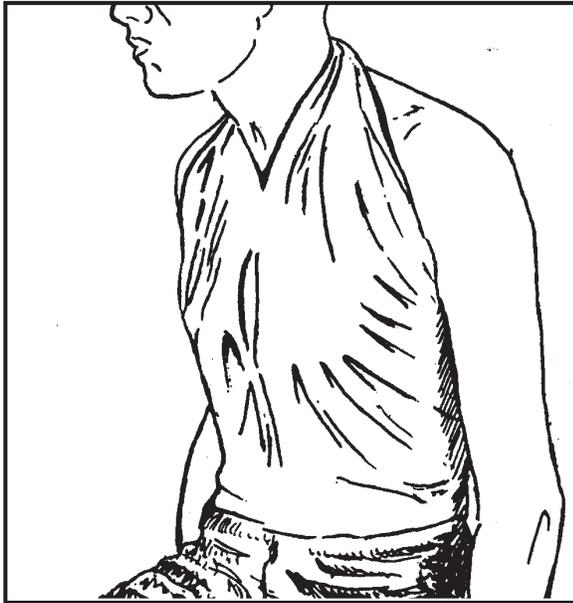


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Figure 3-13.—Triangular bandage for the shoulder.

in front. **For the hand:** After the dressings are applied, place the base of the triangle well up in the palmar surface of the wrist. Carry the point over the ends of the fingers and back of the hand well up on the wrist. Fold the excess bandage at the side of the hand, cross the ends around the wrist, and tie a square knot in front. Figure 3-17 shows the proper application of a triangular bandage for either the foot or the hand.

CRAVAT BANDAGE.—A triangular bandage can be folded into a strip for easy application during an emergency. When folded as shown in figure 3-18, the bandage is called a cravat. To make a cravat bandage, bring the point of the triangular bandage to the middle of the base and continue to fold until a 2-inch width is obtained. The cravat may be tied, or it may be secured with safety pins (if the pins are available).

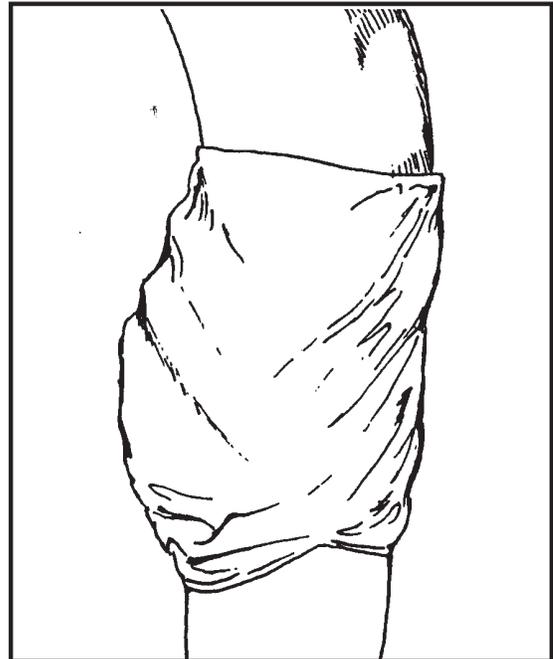
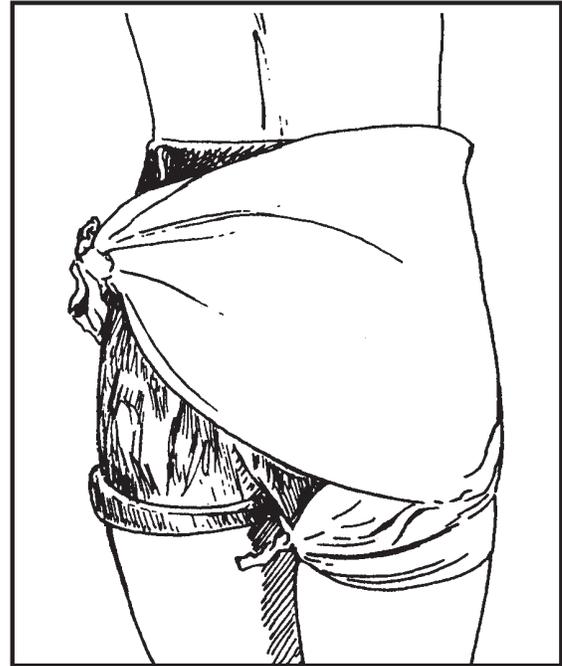


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Figure 3-14.—Triangular bandage for the chest.

When necessary, a cravat can be improvised from common items such as T-shirts, bed linens, trouser legs, scarves, or any other item of pliable and durable material that can be folded, torn, or cut to the desired size.

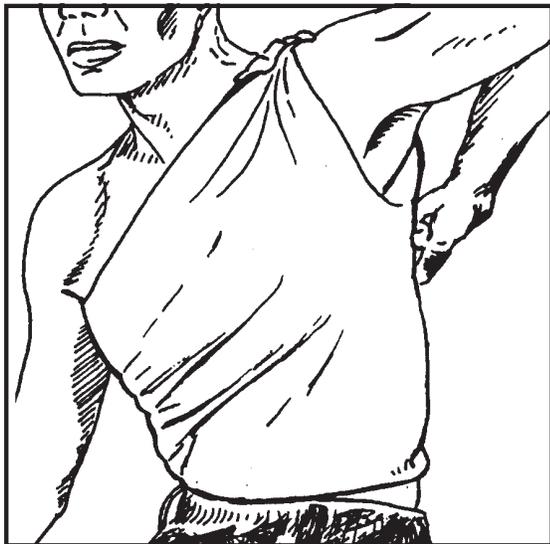
Cravat Bandage for Head.—This bandage is useful to control bleeding from wounds of the scalp or forehead. After placing a compress over the wound, place the center of the cravat over the compress and carry the ends around to the opposite side; cross them, continue to carry them around to the starting point, and tie in a square knot.



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Figure 3-15.—Triangular bandage for the hip or buttock.

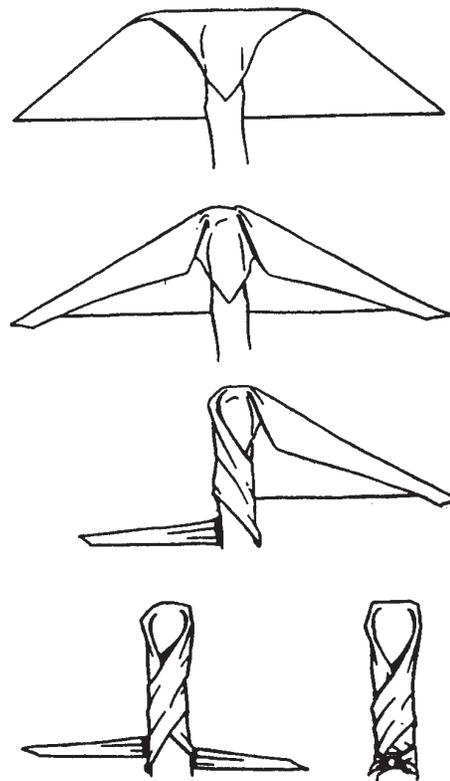
Cravat Bandage for Eye.—After applying a compress to the affected eye, place the center of the cravat over the compress and on a slant so that the lower end is inclined downward. Bring the lower end around under the ear on the opposite side. Cross the ends in back of the head, bring them forward, and tie them over the compress. Figure 3-19 shows the proper application of a cravat bandage for the eye.



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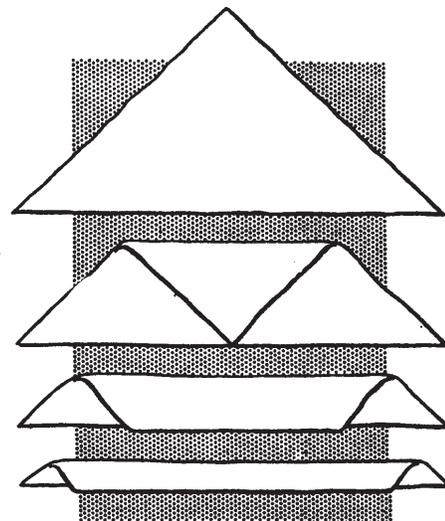
Figure 3-16.—Triangular bandage for the side of the chest.

Cravat Bandage for Temple, Cheek, or Ear.—After a compress is applied to the wound, place the center of the cravat over it and hold one end over the top of the head. Carry the other end under the jaw and up the opposite side, over the top of the head, and cross the two ends at right angles over the temple on the injured side. Continue one end around over the forehead and the other around the back of the head to meet over the temple on the uninjured side. Tie the ends in a square knot. (This bandage is also called a Modified Barton.) Figure 3-20 shows the proper



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Figure 3-17.—Triangular bandage for the foot or hand.

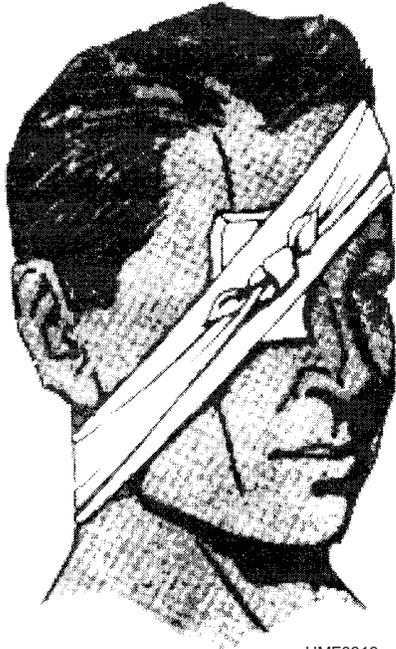


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Figure 3-18.—Cravat bandage.

application of a cravat bandage for the temple, cheek, or ear.

Cravat Bandage for Elbow or Knee.—After applying the compress, and if the injury or pain is not too severe, bend the elbow or knee to a right-angle position before applying the bandage. Place the



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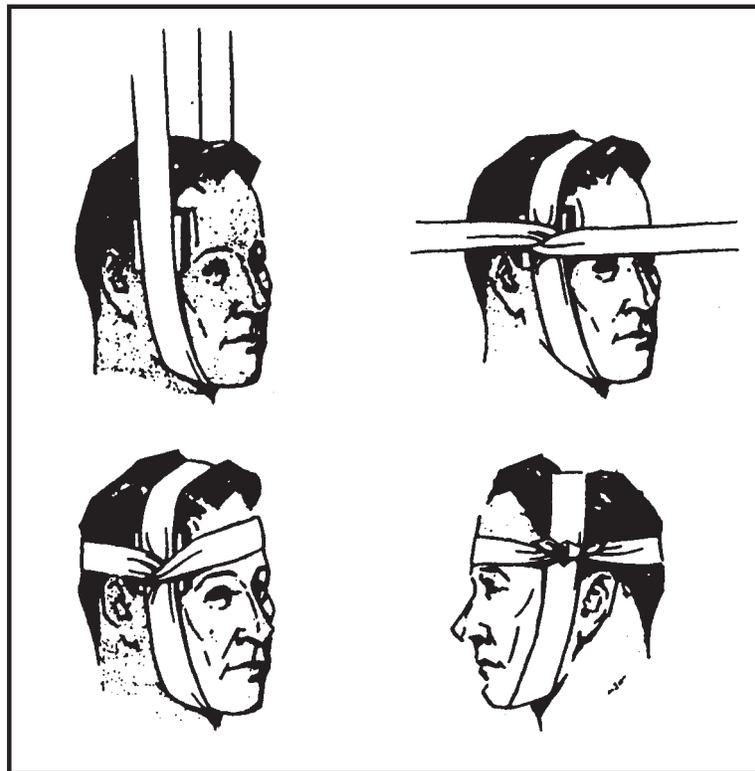
Figure 3-19.—Cravat bandage for the eye.

middle of a rather wide cravat over the point of the elbow or knee, and carry the upper end around the upper part of the elbow or knee, bringing it back to the hollow, and the lower end entirely around the lower

part, bringing it back to the hollow. See that the bandage is smooth and fits snugly; then tie in a square knot outside of the hollow. Figure 3-21 shows the proper application of a cravat bandage for the elbow or knee.

Cravat Bandage for Arm or Leg.—The width of the cravat you use will depend upon the extent and area of the injury. For a small area, place a compress over the wound, and center the cravat bandage over the compress. Bring the ends around in back, cross them, and tie over the compress. For a small extremity, it may be necessary to make several turns around to use all the bandage for tying. If the wound covers a larger area, hold one end of the bandage above the compress and wind the other end spirally downward across the compress until it is secure, then upward and around again, and tie a knot where both ends meet. Figure 3-22 shows the proper application of a cravat bandage for the arm, forearm, leg, or thigh.

Cravat Bandage for Axilla (Armpit).—This cravat is used to hold a compress in the axilla. It is similar to the bandage used to control bleeding from the axilla. Place the center of the bandage in the axilla over the compress and carry the ends up over the top of the shoulder and cross them. Continue across the back and chest to the opposite axilla, and tie them. Do not tie



HMF0320

Figure 3-20.—Cravat (Modified Barton) bandage for the temple, cheek, or ear.

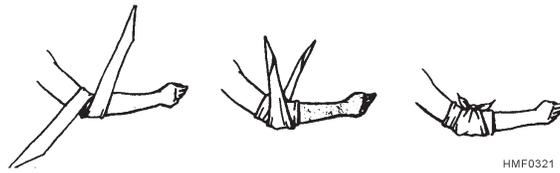


Figure 3-21.—Cravat bandage for the elbow or knee.

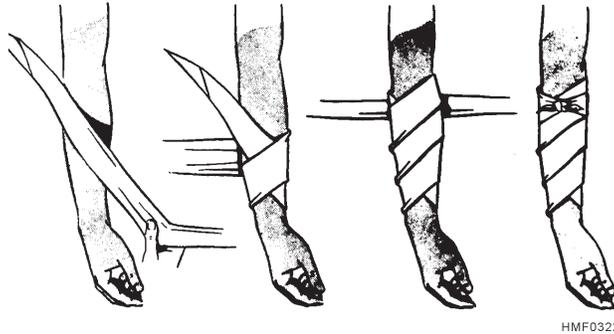


Figure 3-22.—Cravat bandage for the arm, forearm, leg, or thigh.

too tightly or the axillary artery will be compressed, adversely affecting the circulation of the arm. Figure 3-23 shows the proper application of a cravat bandage for the axilla.

BATTLE DRESSING

A battle dressing is a combination compress and bandage in which a sterile gauze pad is fastened to a gauze, muslin, or adhesive bandage (fig. 3-24). Most Navy first aid kits contain both large and small battle dressings of this kind.

RESCUE AND TRANSPORTATION

LEARNING OBJECTIVE: *Identify protective equipment items that are used during patient rescues, and recall how and when each protective equipment item should be used.*

It is a basic principle of first aid that an injured person must be given essential treatment **before** being

moved. However, it is impossible to treat an injured person who is in a position of immediate danger. If the victim is drowning, or if his life is endangered by fire, steam, electricity, poisonous or explosive gases, or other hazards, rescue must take place before first aid treatment can be given.

The life of an injured person may well depend upon the manner in which rescue and transportation to a medical treatment facility are accomplished. Rescue operations must be accomplished quickly, but unnecessary haste is both futile and dangerous. After rescue and essential first aid treatment have been given, further transportation must be accomplished in a manner that will not aggravate the injuries. As a Corpsman, it may be your responsibility to direct—and be the primary rescuer in—these operations. The life and safety of the victim and the members of the rescue team may rest on your decisions.

In this section, we will consider the use of common types of protective equipment; rescue procedures; special rescue situations; ways of moving

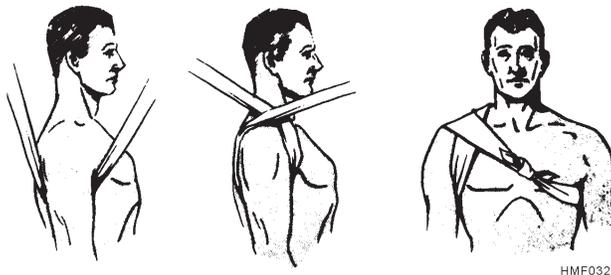


Figure 3-23.—Cravat bandage for the axilla.

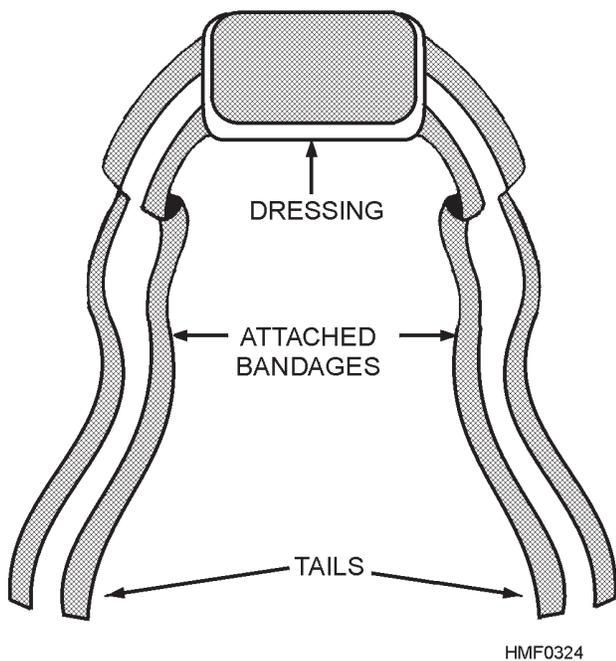


Figure 3-24.—Battle dressing.

the patient to safety; and procedures for transporting the injured after first aid has been given.

PROTECTIVE EQUIPMENT

The use of appropriate items of protective equipment will increase your ability to effect rescue from life-threatening situations. Protective equipment that is generally available on naval vessels and some shore activities include the oxygen breathing apparatus (OBA); hose (air line) masks; protective (gas) masks; steel-wire lifelines; and devices for detecting oxygen insufficiency, explosive vapors, and some poisonous gases.

Oxygen Breathing Apparatus

An oxygen breathing apparatus (OBA) is provided for emergency use in compartments containing toxic gases. The apparatus is particularly valuable for rescue purposes because it is a self-contained unit. The wearer is not dependent upon outside air or any type of air line within the effective life of the canister.

There are several types of OBAs, but they are all similar in operation. Independence of the outside atmosphere is achieved by having air within the apparatus circulated through a canister. Within the canister, oxygen is continuously generated. The effective life of the canister varies from 20 to 45

minutes, depending on the particular apparatus and the type of work being done. One of the newer types of OBA is designed so that you can change canisters without leaving the toxic atmosphere.

If you are to enter an extremely hazardous area, you should also wear a lifeline. The lifeline should be tended by two persons, one of whom is also wearing a breathing apparatus.

Never allow oil or grease to come in contact with any part of an OBA. Oxygen is violently explosive in the presence of oil or grease. If any part of the apparatus becomes contaminated with oil or grease smudges, clean it before it is stowed. Care should be taken to prevent oil or oily water from entering the canister between the time it is opened and the time of disposal.

Hose (Air Line) Masks

Hose masks are part of the allowance of all ships having repair party lockers. They are smaller than the oxygen breathing outfits and can, therefore, be used by persons who must enter voids or other spaces that have very small access hatches. The hose or air line mask consists essentially of a gas mask facepiece with an adjustable head harness and a length of airhose. Note that the air line mask uses **air** rather than pure oxygen. It must **NEVER** be connected to an oxygen bottle, oxygen cylinder, or other source of oxygen. Even a small amount of oil or grease in the air line could combine rapidly with the oxygen and cause an explosion.

Safety belts are furnished with each air line mask and **MUST BE WORN**. A lifeline must be fastened to the safety belt; and the lifeline should be loosely lashed to the airhose to reduce the possibility of fouling. The airhose and lifeline must be carefully tended at all times so that they do not become fouled or cut. The person wearing the air line mask and the person tending the lines should maintain communication by means of standard divers' signals.

Protective (Gas) Masks

Protective masks provide respiratory protection against chemical, biological, and radiological warfare agents. They do not provide protection from the effects of carbon monoxide, carbon dioxide, and a number of industrial gases. Protection from these gases is discussed in the section, "Rescue from Unventilated Compartments," later in this chapter.

In emergencies, protective masks may be used for passage through a smoke-filled compartment or for

entry into such a compartment to perform a job that can be done quickly (such as to close a valve, secure a fan, or de-energize a circuit). However, they provide only limited protection against smoke. The length of time you can remain in a smoke-filled compartment depends on the type of smoke and its concentration.

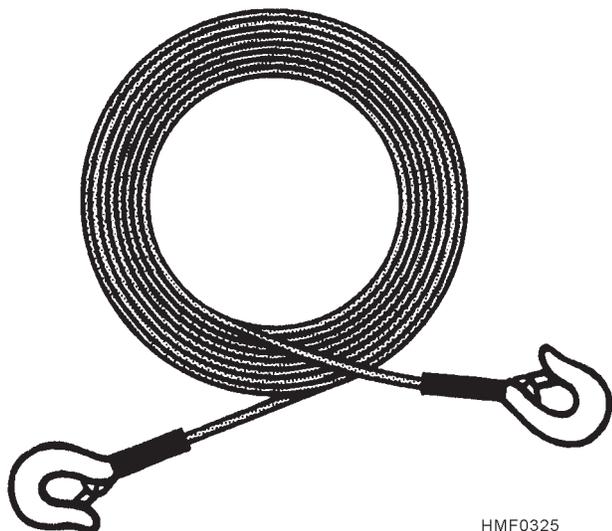
The most important thing to remember about protective masks is that they do not manufacture or supply oxygen. They merely filter the air as it passes through the canister.

Lifelines

The lifeline is a steel-wire cable, 50 feet long. Each end is equipped with a strong hook that closes with a snap catch. The line is very pliable and will slide freely around obstructions. See figure 3–25.

Lifelines are used as a precautionary measure to aid in the rescue of persons wearing rescue breathing apparatus, hose masks, or similar equipment. Rescue, if necessary should be accomplished by having another person equipped with a breathing apparatus follow the lifeline to the person being rescued, rather than by attempting to drag the person out. Attempts to drag a person from a space may result in fouling the lifeline on some obstruction or in parting the harness, in which case it would still be necessary to send a rescue person into the space.

An important point to remember is that a stricken person must never be hauled by a lifeline attached to the waist. The victim may be dragged along the deck a short distance, but his weight must never be suspended on a line attached to the waist. If not wearing a harness of some kind, pass the line around the chest under the armpits and fasten it in front or in back.



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Figure 3–25.—Steel wire lifeline.

When tending a lifeline, you must wear gloves to be able to handle the line properly. Play out the line carefully to keep it from fouling. Try to keep the lifeline in contact with grounded metal; do not allow it to come in contact with any energized electrical equipment.

Detection Devices

The detection devices used to test the atmosphere in closed or poorly ventilated spaces include the **oxygen indicator**, for detecting oxygen deficiency; **combustible-gas indicators**, for determining the concentration of explosive vapors; and **toxic-gas indicators**, such as the **carbon monoxide indicator**, for finding the concentration of certain poisonous gases. The devices are extremely valuable and should be used whenever necessary. However, they **MUST BE USED ONLY AS DIRECTED**. Improper operation of these devices may lead to false assurances of safety or, worse yet, to an increase in the actual danger of the situation. For example, the use of a flame safety lamp in a compartment filled with acetylene or hydrogen could cause a violent explosion.

RESCUE PROCEDURES

LEARNING OBJECTIVE: *Recognize the phases of rescue operations and the stages of extrication.*

If you are faced with the problem of rescuing a person threatened by fire, explosive or poisonous gases, or some other emergency, do not take any action until you have had time to determine the extent of the danger and your ability to cope with it. In a large number of accidents, the rescuer rushes in and becomes the second victim. Do not take unnecessary chances! Do not attempt any rescue that needlessly endangers your own life!

Phases of Rescue Operations

In disasters where there are multiple patients (as in explosions or ship collisions), rescue operations should be performed in phases. These rescue phases apply only to extrication operations.

The first phase is to remove lightly pinned casualties, such as those who can be freed by lifting boxes or removing a small amount of debris.

In the second phase, remove those casualties who are trapped in more difficult circumstances but who can be rescued by use of the equipment at hand and in a minimum amount of time.

In the third phase, remove casualties where extrication is extremely difficult and time consuming. This type of rescue may involve cutting through decks, breaching bulkheads, removing large amounts of debris, or cutting through an expanse of metal. An example would be rescuing a worker from beneath a large, heavy piece of machinery.

The last phase is the removal of dead bodies.

Stages of Extrication

The first stage of extrication within each of the rescue phases outlined above is gaining access to the victim. Much will depend on the location of the accident, damage within the accident site, and the position of the victim. The means of gaining access must also take into account the possibility of causing further injury to the victim since force may be needed. Further injury must be minimized.

The second stage involves giving lifesaving emergency care. If necessary, establish and maintain an open airway, start artificial respiration, and control hemorrhage.

The third stage is disentanglement. The careful removal of debris and other impediments from the victim will prevent further injury to both the victim and the rescuer.

The fourth stage is preparing the victim for removal, with special emphasis on the protection of possible fractures.

The final stage, removing the victim from the trapped area and transporting to an ambulance or sickbay, may be as simple as helping the victim walk out of the area or as difficult as a blanket dragged out of a burning space.

Special Rescue Situations

LEARNING OBJECTIVE: *Recognize the procedural and precautionary steps that must be taken in various rescue situations.*

The procedures you follow in an emergency situation will be determined by the nature of the

disaster or emergency you encounter. Some of the more common rescue situations and the appropriate procedures for each are outlined below.

RESCUE FROM FIRE.—If you must go to the aid of a person whose clothing is on fire, try to smother the flames by wrapping the victim in a coat, blanket, or rug. Leave the head **UNCOVERED**. If you have no material with which to smother the fire, roll the victim over—**SLOWLY**—and beat out the flames with your hands. Beat out the flames around the head and shoulders, then work downward toward the feet. If the victim tries to run, throw him down. Remember that the victim **MUST** lie down while you are trying to extinguish the fire. Running will cause the clothing to burn rapidly. Sitting or standing may cause the victim to be killed instantly by inhaling flames or hot air.

CAUTION: Inhaling flames or hot air can kill YOU, too. **Do not get your face directly over the flames. Turn your face away from the flame when you inhale.**

If your own clothing catches fire, roll yourself up in a blanket, coat, or rug. **KEEP YOUR HEAD UNCOVERED**. If material to smother the fire is not available, lie down, roll over slowly, and beat at the flames with your hands.

If you are trying to escape from an upper floor of a burning building, be very cautious about opening doors into hallways or stairways. Always feel a door before you open it. If the door feels hot, do not open it if there is any other possible way out. Remember, also, that opening doors or windows will create a draft and make the fire worse. So do not open any door or window until you are actually ready to get out.

If you are faced with the problem of removing an injured person from an upper story of a burning building, you may be able to improvise a lifeline by tying sheets, blankets, curtains, or other materials together. Use square knots to connect the materials to each other. Secure one end of the line around some heavy object inside the building, and fasten the other end around the casualty under the arms. You can lower the victim to safety and then let yourself down the line. Do not jump from an upper floor of a burning building except as a last resort.

It is often said that the “best” air in a burning room or compartment is near the floor, but this is true only to a limited extent. There is less smoke and flame down low, near the floor, and the air may be cooler. But it is also true that carbon monoxide and other deadly gases are just as likely to be present near the floor as near the

ceiling. Therefore, if possible, use an oxygen breathing apparatus or other protective breathing equipment when you go into a burning compartment. If protective equipment is not available, cover your mouth and nose with a wet cloth to reduce the danger of inhaling smoke, flame, or hot air.

CAUTION: A WET CLOTH GIVES YOU NO PROTECTION AGAINST POISONOUS GASES OR LACK OF OXYGEN!

RESCUE FROM STEAM-FILLED SPACES.—

It is sometimes possible to rescue a person from a space in which there is a steam leak. Since steam rises, escape upward may not be possible. If the normal exit is blocked by escaping steam, move the casualty to the escape trunk or, if there is none, to the lowest level in the compartment.

RESCUE FROM ELECTRICAL CONTACT.—

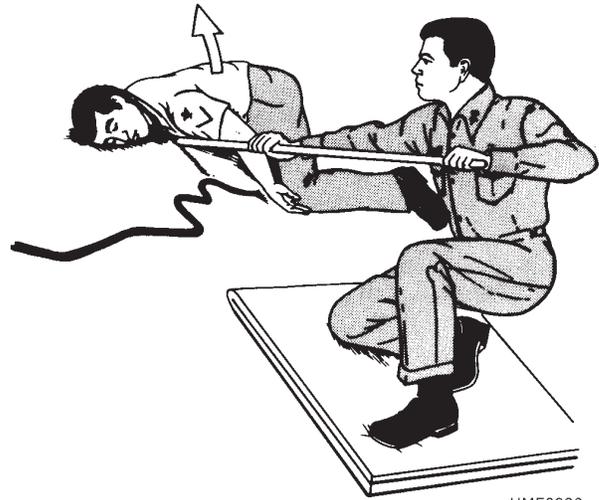
Rescuing a person who has received an electrical shock is likely to be difficult and dangerous. Extreme caution must be used, or you may be electrocuted yourself.

CAUTION: YOU MUST NOT TOUCH THE VICTIM'S BODY, THE WIRE, OR ANY OTHER OBJECT THAT MAY BE CONDUCTING ELECTRICITY.

First of all, look for the switch. If you find the switch, turn off the current immediately. Do not waste too much time hunting for the switch: Every second is important.

If you cannot find the switch, try to remove the wire from the victim with a **DRY** broom handle, branch, pole, oar, board, or similar **NONCONDUCTING** object. It may be possible to use a **DRY** rope or **DRY** clothing to pull the wire away from the victim. You can also break the contact by cutting the wire with a **WOODEN-HANDLED** axe, but this is extremely dangerous because the cut ends of the wire are likely to curl and lash back at you before you have time to get out of the way. When you are trying to break an electrical contact, always stand on some nonconducting material such as a **DRY** board, **DRY** newspapers, or **DRY** clothing. See figure 3-26.

RESCUE FROM UNVENTILATED COMPARTMENTS.—Rescuing a person from a void,



HMF0326

Figure 3-26.—Moving a victim away from an electrical line.

double bottom, gasoline or oil tank, or any closed compartment or unventilated space is generally a very hazardous operation. Aboard naval vessels and at naval shore stations, no person is permitted to enter any such space or compartment until a damage control officer (DCO), or some person designated by the DCO, has indicated that the likelihood of suffocation, poisoning, and fire or explosion has been eliminated as far as possible. The rescue of a person from any closed space should therefore be performed under the supervision of the DCO or in accordance with the DCO's instructions. In general, it is necessary to observe the following precautions when attempting to rescue a person from any closed or poorly ventilated space:

- If possible, test the air for oxygen deficiency, poisonous gases, and explosive vapors.
- Wear a hose (air line) mask or oxygen breathing apparatus. The air line mask is preferred for use in spaces that may contain high concentrations of oil or gasoline vapors. Do not depend upon a protective mask or a wet cloth held over your face to protect you from oxygen deficiency or poisonous gases.
- Before going into a compartment that may contain explosive vapors, be sure that people are stationed nearby with fire-extinguishing equipment.

- When going into any space that may be deficient in oxygen or contain poisonous or explosive vapors, be sure to maintain communication with someone outside. Wear a lifeline, and be sure that it is tended by a competent person.
- Do not use, wear, or carry any object or material that might cause a spark. Matches, cigarette lighters, flashlights, candles or other open flames, and ordinary electrical lights must **NEVER** be taken into a compartment that may contain explosive vapors. The kind of portable light used by cleaning parties in boilers, fuel tanks, and similar places may be taken into a suspect compartment. This is a steam-tight, glove-type light whose exposed metal parts are either made of nonsparking alloy or protected in some way so they will not strike a spark.

An electrical apparatus or tool that might spark must never be taken into a compartment until a DCO has indicated that it is safe to do so. When electrical equipment is used (e.g., an electric blower might be used to vent a compartment of explosive vapors), it must be explosion proof and properly grounded.

If you go into a space that may contain explosive vapors, do not wear clothing that has any exposed spark-producing metal. For example, do not wear boots or shoes that have exposed nailheads or rivets, and do not wear coveralls or other garments that might scrape against metal and cause a spark.

A particular caution must be made concerning the use of the steel-wire lifeline in compartments that may contain explosive vapors. If you use the line, be sure that it is carefully tended and properly grounded at all times. When other considerations permit, you should use a rope line instead of the steel-wire lifeline when entering compartments that may contain explosive vapors.

RESCUE FROM THE WATER.—You should never attempt to swim to the rescue of a drowning person unless you have been trained in lifesaving methods—and then only if there is no better way of reaching the victim. A drowning person may panic and fight against you so violently that you will be unable either to carry out the rescue or to save yourself. Even if you are not a trained lifesaver, however, you can help a drowning person by holding out a pole, oar, branch, or stick for the victim to catch hold of, or by throwing a lifeline or some buoyant object that will support the victim in the water.

Various methods are used aboard ship to pick up survivors from the water. The methods used in any particular instance will depend upon weather conditions, the type of equipment available aboard the rescue vessel, the number of people available for rescue operations, the physical condition of the people requiring rescue, and other factors. In many cases it has been found that the best way to rescue a person from the water is to send out a properly trained and properly equipped swimmer with a lifeline.

It is frequently difficult to get survivors up to the deck of the rescuing vessel, even after they have been brought alongside the vessel. Cargo nets are often used, but many survivors are unable to climb them without assistance. Persons equipped with lifelines (and, if necessary, dressed in anti-exposure suits) can be sent over the side to help survivors up the nets. If survivors are covered with oil, it may take the combined efforts of four or five people to get one survivor up the net.

A seriously injured person should never, except in an extreme emergency, be hauled out of the water by means of a rope or lifeline. Special methods must be devised to provide proper support, both to keep the victim in a horizontal position and to provide protection from any kind of jerking, bending, or twisting motion. The Stokes stretcher (described later in this chapter) can often be used to rescue an injured survivor. People on the deck of the ship can then bring the stretcher up by means of handlines. Life preservers, balsa wood, unicellular material, or other flotation gear can be used, if necessary, to keep the stretcher afloat.

MOVING THE VICTIM TO SAFETY

LEARNING OBJECTIVE: *Recognize the different patient-moving devices and lifting techniques that can be used in patient rescues.*

In an emergency, there are many ways to move a victim to safety, ranging from one-person carries to stretchers and spineboards. The victim's condition and the immediacy of danger will dictate the appropriate method. Remember, however, to give all necessary first aid **BEFORE** moving the victim.

Stretchers

The military uses a number of standard stretchers. The following discussion will familiarize you with the most common types. When using a stretcher, you should consider a few general rules:

- Use standard stretchers when available, but be ready to improvise safe alternatives.
- When possible, bring the stretcher to the casualty.
- Always fasten the victim securely to the stretcher.
- Always move the victim **FEET FIRST** so the rear bearer can watch for signs of breathing difficulty.

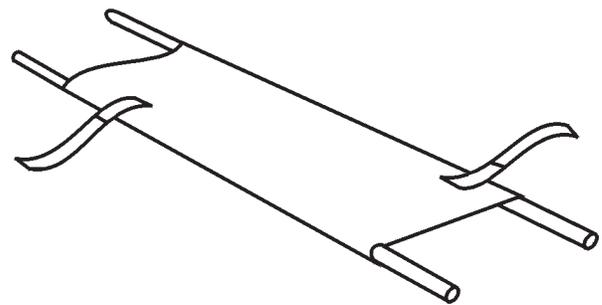
STOKES STRETCHER.—The Navy service litter most commonly used for transporting sick or injured persons is called the Stokes stretcher. As shown in figure 3-27, the Stokes stretcher is essentially a wire basket supported by iron rods. Even if the stretcher is tipped or turned, the casualty can be held securely in place, making the Stokes adaptable to a variety of uses. This stretcher is particularly valuable for transferring injured persons to and from boats. As mentioned before, it can also be used with flotation devices to rescue injured survivors from the water. It is also used for direct ship-to-ship transfer of injured persons. Fifteen-foot handling lines are attached to each end for shipboard use in moving the victim.

The Stokes stretcher should be padded with three blankets: two of them should be placed lengthwise (so that one will be under each of the casualty's legs), and the third should be folded in half and placed in the upper part of the stretcher to protect the head and shoulders. The casualty should be lowered gently into the stretcher and made as comfortable as possible. The feet must be fastened to the end of the stretcher so that

the casualty will not slide down. Another blanket (or more, if necessary) should be used to cover the casualty. The casualty must be fastened to the stretcher by means of straps that go over the chest, hips, and knees. Note that the straps go **OVER** the blanket or other covering, thus holding it in place.

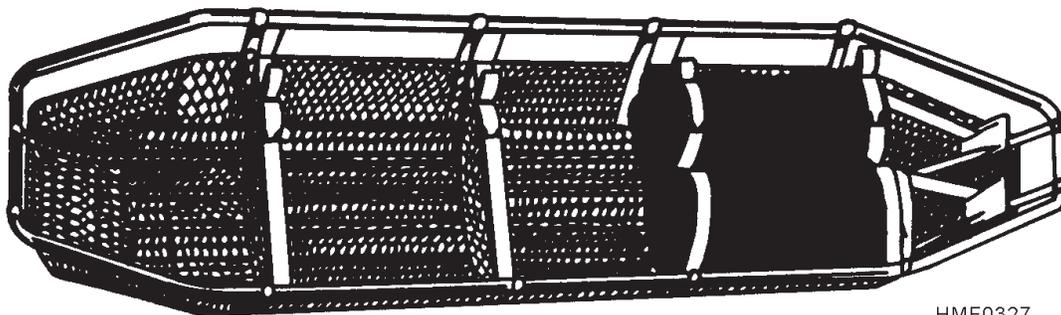
ARMY LITTER.—The Army litter, shown in figure 3-28, is a collapsible stretcher made of canvas and supported by wooden or aluminum poles. It is very useful for transporting battle casualties in the field. However, it is sometimes difficult to fasten the casualty onto the Army litter, and for this reason its use is somewhat limited aboard ship. The litter legs keep the patient off the ground. The legs fit into the restraining tracks of a jeep or field ambulance to hold the litter in place during transport.

MILLER (FULL BODY) BOARD.—The Miller Board (fig 3-29) is constructed of an outer plastic shell with an injected foam core of polyurethane foam. It is impervious to chemicals and the elements and can be used in virtually every confined-space rescue and vertical extrication. The Miller Board provides for full body immobilization through a harness system, including a hood and two-point contact for the head (forehead and chin) to stabilize the head and cervical spine. The board's narrow design allows passage through hatches and crowded passageways. It fits



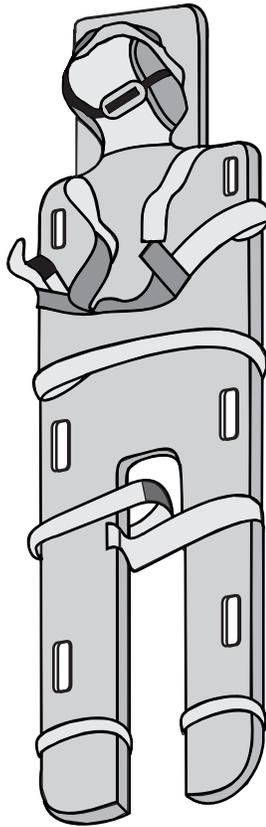
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Figure 3-28.—Opening an Army litter.



HMF0327

Figure 3-27.—Stokes stretcher.



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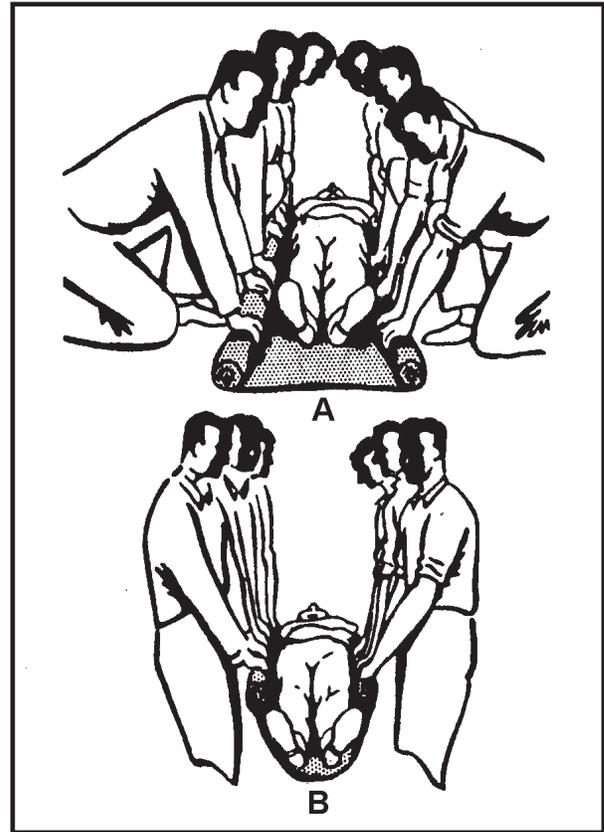
Figure 3-29.—Miller (full body) Board.

within a Stokes (basket) stretcher and will float a 250-pound person.

IMPROVISED STRETCHERS.—Standard stretchers should be used whenever possible to transport a seriously injured person. If none are available, it may be necessary for you to improvise. Shutters, doors, boards, and even ladders may be used as stretchers. All stretchers of this kind must be very well padded and great care must be taken to see that the casualty is fastened securely in place.

Sometimes a blanket may be used as a stretcher, as shown in figure 3-30. The casualty is placed in the middle of the blanket in the supine position. Three or four people kneel on each side and roll the edges of the blanket toward the casualty, as shown in figure 3-30A. When the rolled edges are tight and large enough to grasp securely, the casualty should be lifted and carried as shown in figure 3-30B.

Stretchers may also be improvised by using two long poles (about 7 feet long) and strong cloth (such as a rug, a blanket, a sheet, a mattress cover, two or three gunny sacks, or two coats). Figure 3-31 shows an improvised stretcher made from two poles and a blanket.



HMf0330

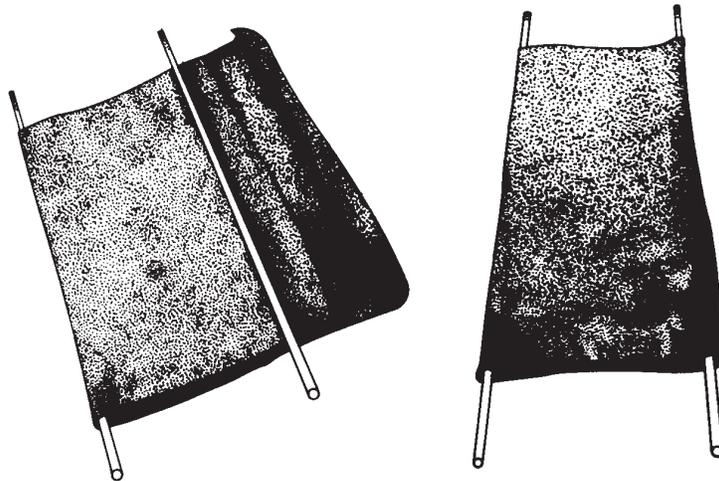
Figure 3-30.—Blanket used as an improvised stretcher.

CAUTION: Many improvised stretchers do not give sufficient support in cases where there are fractures or extensive wounds of the body. They should be used only when the casualty is able to stand some sagging, bending, or twisting without serious consequences. An example of this type of improvised stretcher would be one made of 40 to 50 feet of rope or 1-1/2-inch firehose (fig. 3-32).

Spineboards

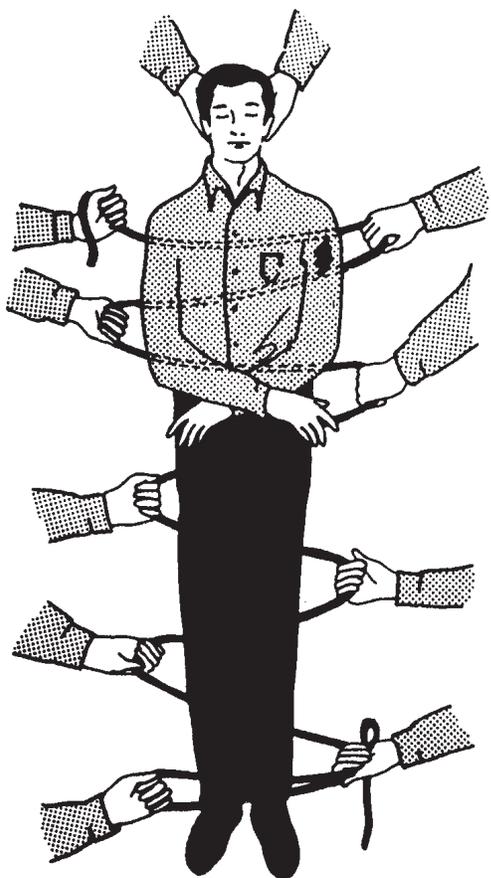
Spineboards are essential equipment in the immobilization of suspected or real fractures of the spinal column. Made of fiberglass or exterior plywood, they come in two sizes, short (18" × 32") and long (18" × 72"), and are provided with handholds and straps. Spineboards also have a runner on the bottom to allow clearance to lift (fig. 3-33).

A short spineboard is primarily used in extrication of sitting victims, especially in automobile wrecks (where it would be difficult to maneuver the victim out of position without doing additional damage to the spine). The long board makes a firm litter, protecting the back and neck, and providing a good surface for



HMF0331

Figure 3-31.—Improvised stretcher using blankets and poles.

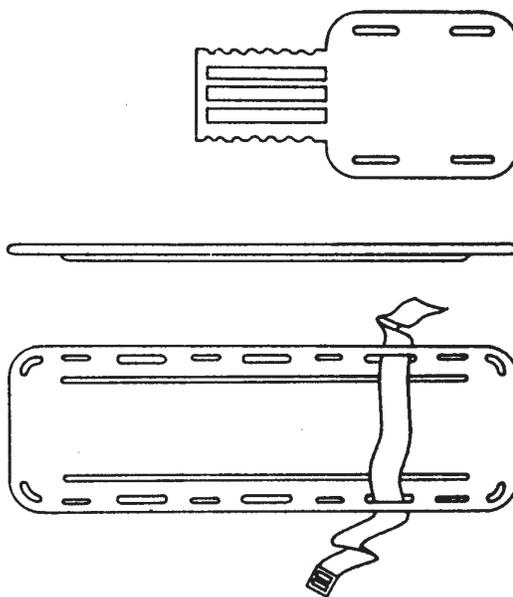


HMF0332

Figure 3-32.—Improvised stretcher using rope or firehose.

CPR and a good sliding surface for difficult extractions.

The short and long boards are often used together. For example, at an automobile accident site, the



HMF0333

Figure 3-33.—Spineboards.

Corpsman's first task is to assess the whole situation and to plan the rescue. If bystanders must be used, it is essential that they be briefed in thorough detail on what you want them to do. After all accessible bleeding has been controlled and the fractures splinted, the short spineboard should be moved into position behind the victim. A neck collar should be applied in all cases and will aid in the immobilization of the head and neck. The head should then be secured to the board with a headband or a 6-inch self-adhering roller bandage. The victim's body should then be secured to the board by use of the supplied straps around the chest and thighs. The victim may then be lifted out. If, however,

the victim is too large, or further immobilization of the lower extremities is necessary, the long spineboard may be slid at a right angle behind the short spineboard, and the victim maneuvered onto his side and secured to the longboard.

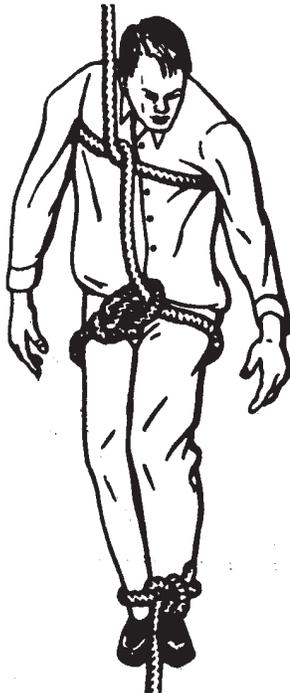
The possible uses of the spineboard in an emergency situation are limited only by the imagination of the rescuers.

Emergency Rescue Lines

As previously mentioned, the steel-wire lifeline can often be used to haul a person to safety. An emergency rescue line can also be made from any strong fiber line. Both should be used only in extreme emergencies, when an injured person must be moved and no other means is available. Figure 3–34 shows an emergency rescue line that could be used to hoist a person from a void or small compartment. Notice that a running bowline is passed around the body, just below the hips, and a half hitch is placed just under the arms. Notice also that a guideline is tied to the casualty's ankles to prevent banging against bulkheads and hatchways.

Rescue Drag and Carry Techniques

There will be times when you, as a Corpsman, will be required to evacuate a sick or injured person from an



HMF0334

Figure 3–34.—Hoisting a person.

emergency scene to a location of safety. Casualties carried by manual means must be carefully and correctly handled, otherwise their injuries may become more serious or possibly fatal. Situation permitting, evacuation or transport of a casualty should be organized and unhurried. Each movement should be performed as deliberately and gently as possible.

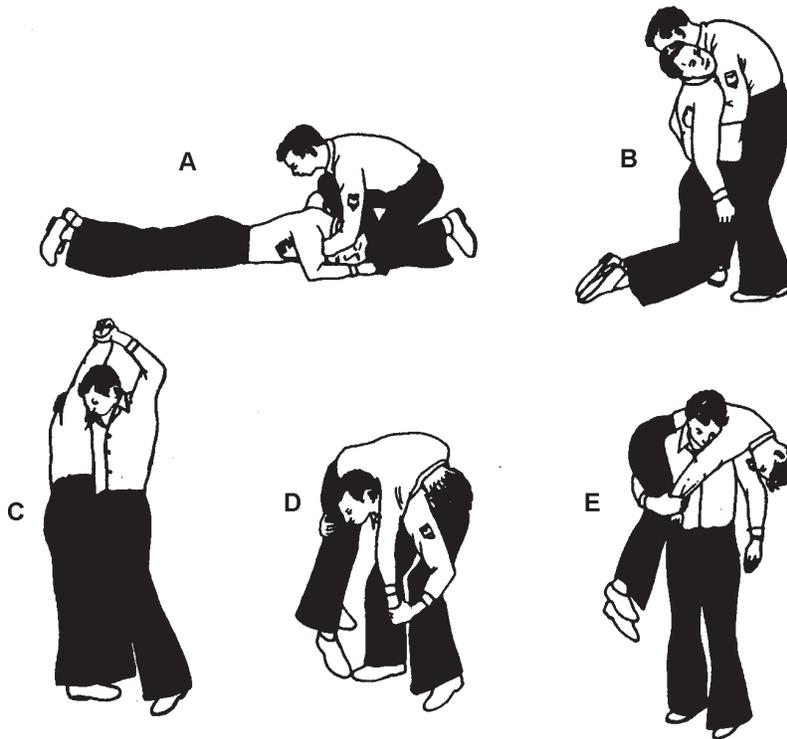
Manual carries are tiring for the bearer(s) and involve the risk of increasing the severity of the casualty's injury. In some instances, however, they are essential to save the casualty's life. Although manual carries are accomplished by one or two bearers, the two-man carries are used whenever possible. They provide more comfort to the casualty, are less likely to aggravate his injuries, and are also less tiring for the bearers, thus enabling them to carry him farther. The distance a casualty can be carried depends on many factors, such as

- strength and endurance of the bearer(s),
- weight of the casualty,
- nature of the casualty's injury, and
- obstacles encountered during transport.

You should choose the evacuation technique that will be the least harmful, both to you and the victim. When necessary and appropriate, use a one-rescuer technique (several of which are described in the following section). Two-rescuer techniques and the circumstances under which those techniques are appropriate are also listed below.

ONE-RESCUER TECHNIQUES.—If a victim can stand or walk, assist him to a safe place. If there are no indications of injury to the spine or an extremity but the casualty is not ambulatory, he can be carried by means of any of the following:

- **Fireman's Carry:** One of the easiest ways to carry an unconscious person is by means of the fireman's carry. Figure 3–35 shows the steps of this procedure.
- **Pack-strap Carry:** With the pack-strap carry, shown in figure 3–36, it is possible to carry a heavy person for some distance. Use the following procedure:
 1. Place the casualty in a supine position.
 2. Lie down on your side along the casualty's uninjured or less injured side. Your shoulder should be next to the casualty's armpit.
 3. Pull the casualty's far leg over your own, holding it there if necessary.



HMF0335

Figure 3-35.—Fireman's carry.



HMF0336

Figure 3-36.—Pack-strap carry.

4. Grasp the casualty's far arm at the wrist and bring it over your upper shoulder as you roll and pull the casualty onto your back.

5. Raise up your knees, holding your free arm for balance and support. Hold both the casualty's wrists close against your chest with your other hand.
6. Lean forward as you rise to your feet, and keep both of your shoulders under the casualty's armpits.

Do not attempt to carry a seriously injured person by means of the pack-strap carry, especially if the arms, spine, neck, or ribs are fractured.

- **Arm Carry:** The technique for a one-person arm carry is shown in figure 3-37. However, you should never try to carry a person who is seriously injured with this method. Unless considerably smaller than you are, you will not be able to carry the casualty very far using this technique.

- **Blanket Drag:** The blanket drag, shown in figure 3-38, can be used to move a person who, due to the severity of the injury, should not be lifted or carried by one person alone. Place the casualty in the supine position on a blanket and pull the blanket along the floor or deck. Always pull the casualty head first, with the head and shoulders slightly raised so that the head will not bump against the deck.



HMF0337

Figure 3-37.—One-person arm carry.

A variant of the blanket drag is the **clothes drag**, where the rescuer drags the victim by the clothing on the victim's upper body.

- **Tied-hands Crawl:** The tied-hands crawl, shown in figure 3-39, may be used to drag an unconscious person for a short distance. It is particularly useful when you must crawl underneath a low structure, but it is the least desirable because the victim's head is not supported.

To be carried by this method, the casualty must be in the supine position. Cross the wrists and tie them together. Kneel astride the casualty and lift the arms over your head so that the wrists are at the back of your neck. When you crawl forward, raise your shoulders high enough so that the casualty's head will not bump against the deck.

TWO-RESCUER TECHNIQUES.—If the casualty is ambulatory, you and your partner should assist him to safety. However, if the victim has either a spinal injury or a fractured extremity, there are a



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Figure 3-38.—Blanket drag.

number of two-rescuer techniques that can be used to move him to safety.

- **Chair Carry:** The chair carry can often be used to move a sick or injured person away from a position of danger. The casualty is seated on a chair, as shown in figure 3-40, and the chair is carried by two rescuers. This is a particularly good method to use when you must carry a person up or down stairs or through narrow, winding passageways. **This carry must NEVER be used to move a person who has an injured neck, back, or pelvis.**

- **Arm Carry:** The two-person arm carry, shown in figures 3-41 and 3-42, can be used in some cases to move an injured person. However, **this carry should not be used to carry a person who has serious wounds or broken bones.**

Another two-person carry that can be used in emergencies is shown in figure 3-43. Two rescuers position themselves beside the casualty, on the same side, one at the level of the chest and the other at the thighs. The rescuers interlock adjacent arms as shown, while they support the victim at the shoulders and knees. In unison, they lift the victim and roll his front toward theirs. **This carry must not be used to move seriously injured persons.**



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Figure 3-39.—Tied-hands crawl.



Figure 3-40.—Chair carry.



Figure 3-42.—Two-person arm carry (alternate).



Figure 3-41.—Two-person arm carry.

TRANSPORTATION OF THE INJURED

LEARNING OBJECTIVE: *Recognize the different forms of emergency transportation, and identify essential BLS equipment and supplies on Navy ambulances.*

Thus far we have dealt with emergency methods used to move an injured person out of danger and into a position where first aid can be administered. As we have seen, these emergency rescue procedures often involve substantial risk to the casualty and should be used only when clearly necessary.

Once you have rescued the casualty from the immediate danger, **SLOW DOWN!** Casualties should not be moved before the type and extent of injuries are evaluated and the required emergency medical treatment is given. (The exception to this occurs, of course, when the situation dictates immediate movement for safety purposes. For example, it may be necessary to remove a casualty from a burning vehicle. The situation dictates that the urgency of casualty movement outweighs the need to administer emergency medical treatment.)

From this point on, handle and transport the casualty with every regard for the injuries that have been sustained. In the excitement and confusion that almost always accompany an accident, you are likely to feel rushed, wanting to do everything rapidly. To a certain extent, this is a reasonable feeling. Speed is essential in treating many injuries and in getting the casualty to a medical treatment facility. However, it is not reasonable to let yourself feel so hurried that you



HMF0343

Figure 3-43.—Two-person arm carry (alternate).

become careless and transport the victim in a way that will aggravate the injuries.

Emergency Vehicles

In most peacetime emergency situations, some form of ambulance will be available to transport the victim to a medical treatment facility. Navy ambulances vary in size and shape from the old “gray ghost” to modern van and modular units. Although there are many differences in design and storage capacity, most Navy ambulances are equipped to meet the same basic emergency requirements. They contain equipment and supplies for emergency airway care, artificial ventilation, suction, oxygenation, hemorrhage control, fracture immobilization, shock control, blood pressure monitoring, and poisoning. They will also contain litters, spineboards, and other supplies and equipment as mandated in BUMEDINST 6700.42. (Table 3-1, at the beginning of this chapter, lists the currently required equipment for EMT-Basic level ambulances, and table 3-2 lists the contents of an emergency bag that a Hospital Corpsman might find in that ambulance.)

Deployed units at sea and in the field and certain commands near air stations will also have access to helicopter MEDEVAC support. Helicopters are ideal for use in isolated areas but are of limited practical use at night, in adverse weather, under certain tactical conditions, or in developed areas where building and power lines interfere. In addition to taking these factors into consideration, the Corpsman must decide if the victim’s condition is serious enough to justify a call for a helicopter.

Some injuries require very smooth transportation or are affected by pressure changes that occur in flight. The final decision will be made by the unit commander, who is responsible for requesting the helicopter support.

Preparing the Patient for Transport

LEARNING OBJECTIVE: *Recall preparatory, en route, and turnover procedures for patients being transported to medical treatment facilities.*

Once emergency medical care has been completed on-scene, the patient must be transferred to the medical treatment facility. A process known as **packaging** provides the means of properly positioning, covering, and securing the patient to avoid any unnecessary aggravation to the patient’s condition. (Covering helps maintain the patient’s body temperature, prevents exposure to the elements, and provides privacy.) Do not “package” a badly traumatized patient; it is more important to transport the critical or unstable patient to the medical treatment facility quickly. The most important aspect of each rescue or transfer is to complete it as safely and efficiently as possible.

Care of Patient en Route

The emergency care a Corpsman can offer patients en route is limited only by the availability of supplies, the level of external noise and vibrations, and the degree and ingenuity the Corpsman possesses.

Care at the Medical Treatment Facility

Do not turn the victim over to anyone without giving a complete account of the situation, especially if a tourniquet was used or medications administered. If possible, while en route, write down the circumstances of the accident, the treatment given, and keep a log of vital signs. After turning the patient over to the medical treatment facility, ensure that depleted ambulance supplies are replaced so that the vehicle is in every way ready to handle another emergency.

SUMMARY

This chapter covered first aid equipment and supplies, and rescue and transportation of the injured

patient. You should now be able to recognize the various types of dressings and bandages, as well as how and when to apply them. You should be familiar with protective equipment, rescue operations, the stages of extrication, and the precautionary steps that must be taken in special rescue situations. Additionally, you should be acquainted with the different patient-moving devices and lifting techniques. Further, you should be able to identify essential basic life support equipment and supplies on Navy ambulances, and you should be able to recognize different forms of emergency transportation. Finally, you should now be able to recall preparatory, en route, and turnover procedures for patients being transported to medical treatment facilities.