ADMINISTRATIVE PROBLEMS

Questions of an administrative nature (missing pages in subcourse, etc.) should be addressed to your primary instructor (group leader). If you have questions of an administrative nature after you have completed the course, you may write or call the Army Institute for Professional Development (AIPD) at the following:

Address: The Army Institute for Professional Development
ATTN: ATIC-IPS (Student Services)
U.S. Army Training Support Center
Newport News, VA 23628-0001

Telephone: DSN 927-2127/3322
Commercial (757) 878-2127/3322
email teama@atsc.army.mil

CONTENT

Questions about the content of this subcourse should be directed to your primary instructor (group leader). If you still have questions or comments concerning course content, write or call the instructional systems specialist responsible for the subcourse. The instructional systems specialist responsible for this edition of the subcourse is Mr. Roy Davis, Multimedia Development Branch, Department of Distance Learning.

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CLARIFICATION OF TRAINING LITERATURE TERMINOLOGY

When used in this publication, words such as "he," "him," "his," and "men" are intended to include both the masculine and feminine genders unless specifically stated otherwise or when obvious in context.

This subcourse is approved for resident and correspondence course instruction. It reflects the current thought of the Academy of Health Sciences and conforms to printed Department of the Army doctrine as closely as currently possible. Development and progress render such doctrine subject to change.

The "D" edition of the Combat Lifesaver Course replaces the previous "C" edition.

This subcourse may be reproduced locally, if needed.

COMBAT LIFESAVER COURSE: MEDICAL TASKS

INTERSCHOOL SUBCOURSE 0825

U.S. Army Medical Department Center and School
Fort Sam Houston, Texas

GENERAL

Interschool Subcourse 0825, Combat Lifesaver Course: Medical Tasks, contains information needed to successfully complete the written and performance examinations which comprise the second (medical tasks) phase of the Combat Lifesaver Course. The instruction in this subcourse covers those combat lifesaver tasks which are beyond the level of buddy-aid care taught to all soldiers. Terminal learning objectives for this subcourse are given below.

TASK: Evaluate a casualty on the battlefield to determine the care to be administered.

CONDITIONS: Given a casualty.

STANDARDS: Correctly applies the principles set forth in this subcourse to determine the care needed.

TASK: Take a casualty's pulse and respiration.

CONDITIONS: Given a casualty and a timepiece with second hand.

STANDARDS: Pulse and respiration taken in accordance with procedures set forth in this subcourse.

TASK: Treat a casualty.

CONDITIONS: Given a casualty with, exposure to chemical agents, fractured limb, battle fatigue, common cold, headache, or in need of an oropharyngeal airway and a combat lifesaver aid bag.

STANDARDS: Treats casualty in accordance with procedures set forth in this subcourse.

TASK: Initiate an intravenous infusion.

CONDITIONS: Given a casualty with hypovolemic shock or other condition requiring an IV and a combat lifesaver aid bag.

STANDARDS: Initiates an intravenous infusion in accordance with procedures set forth in this subcourse.

TASK: Transport a casualty.

CONDITIONS: Given a casualty in need of evacuation, a litter, three other litter bearers, and vehicle to be used in evacuation (if available).

STANDARDS: Evacuates casualty using appropriate litter carry and loads and unloads casualties from ground and air ambulances and other vehicles in accordance with procedures set forth in this subcourse.

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ADMINISTRATIVE INSTRUCTIONS

SUBCOURSE CONTENT

NOTE: The 91W Health Care Specialist is currently the 91B Medical Specialist. The 91B becomes 91W on 1 Oct 2001.

This subcourse contains 10 lessons (lessons 16-25). Each lesson presents information needed to successfully perform the medical tasks which a combat lifesaver must know.

SUPPLEMENTARY REQUIREMENTS

Materials Needed. You will be furnished with needed materials at the time you take the performance (hands-on) examinations. You may be required to furnish a pencil for the written examination.

Supervisory Assistance. You may study the information contained in this subcourse on your own before attending classroom instruction. When you take the performance (hands-on) examinations, the evaluator will use checklists similar to those contained in this subcourse. The written examination consists of multiple-choice items and will be closed-book and proctored.

References. No supplementary references are needed for this subcourse.

SUGGESTED STUDY PROCEDURES

After reading and studying the text assignment of a lesson, complete the lesson exercises at the end of the lesson. If possible, answer the exercises without referring back to the lesson text. After completing the exercises, check your answers against the solutions located at the end of the lesson. For each exercise answered incorrectly, reread the material referenced for that exercise.

If the lesson exercises contain a performance exercise, study the steps until you know what you must do and the sequence in which the steps are performed. Some tasks, such as taking pulse and respiration, can be practiced. Your instructor may allow you to practice starting an IV on an artificial arm, but do not attempt to start an IV on a person unless you are under direct medical supervision.

Complete each lesson before proceeding to the next.

As you study this subcourse, write down comments on the student comment sheet located at the end of this subcourse. Remove, fold, tape, and mail the comment sheet after you complete the examinations.

GRADING AND CERTIFICATION

This subcourse has a multiple-choice written examination and several performance (hands-on) examinations. Consult the objectives (task, conditions, and standard statements) at the beginning of each lesson to determine the learning objectives.

You must score a minimum of 70 percent on the written examination and a GO on each performance examination (a NO GO on any step of a checklist will result in a NO GO for the entire checklist) in order to satisfactorily complete this subcourse.

The written examination will be proctored. You will not be allowed to use the subcourse or notes during the examination.

The primary instructor (or a designated assistant) will be responsible for grading the written and performance examinations. Please consult your primary instructor or his designated assistant for any questions concerning retaking a failed examination (written or performance). An examination may have more than one version. If so, the alternate version may be used for retesting.

Successful completion of the written and all performance (hands-on) examinations (in addition to successful completion of all IS0824 buddy-aid examinations) is required for successful completion of the Combat Lifesaver Course.

A student who successfully completes the entire Combat Lifesaver Course (IS0824 and IS0825) will receive 40 credit hours from the Army Institute For Professional Development (IPD), Fort Eustis, Virginia. There is no partial credit. AIPD will send a notice of course completion for each student who has successfully completed the entire course to the primary instructor. The primary instructor will forward the notices to the students.

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LESSON 16
OVERVIEW

TASK

Identify the functions of the combat lifesaver and the contents of the combat lifesaver aid bag.

CONDITION

Given multiple-choice items pertaining to the role of the combat lifesaver and to the combat lifesaver aid bag.

STANDARD

Score 70 or more points on the 100 point written examination.

REFERENCES

AR 350-41, Training in Units.
FM 21-11, First Aid for Soldiers.
Soldiers Training Publications (STP) 8-91B15-SM-TG, Soldier's Manual and Trainer's Guide: MOS 91B, Medical Specialist, Skill Levels 1/2/3/4/5.
STP 21-1-SMCT, Soldier's Manual of Common Tasks, Skill Level 1.
STP 8-91-SM CMF 91 General Medical Tasks.

16-1. INTRODUCTION

You have already been tested on your ability to perform the buddy-aid tasks which every soldier is expected to know and perform. The tasks you will now learn are tasks normally performed by the 91W Health Care Specialist (91B Medical Specialist). The most important task you will learn is to initiate an intravenous infusion. Initiating an intravenous infusion will help to control shock caused by blood loss, severe burns, or severe heat injury.

16-2. IDENTIFY THE PURPOSE OF THE COMBAT LIFESAVER

The Army battle doctrine was developed for a mobile and widely dispersed battlefield. The doctrine recognizes that battlefield constraints will limit the ability of trained medical personnel, including combat medics (Health Care Specialists MOS 91W), to provide immediate, far-forward care. Therefore, a plan was developed to provide additional care to injured combat soldiers. The combat lifesaver is part of this plan.

The combat lifesaver is a <u>nonmedical</u> soldier who provides lifesaving measures as a <u>secondary</u> mission as his primary (combat) mission allows. The combat lifesaver may also

assist the combat medic in providing care and preparing casualties for evacuation when the combat lifesaver has no combat duties to perform.

Normally, one member of each squad, team, crew, or equivalent-sized unit will be trained as a combat lifesaver.

A major advantage of the combat lifesaver is that he will probably be nearby if a member of his squad or team is injured. It may take a combat medic several minutes or longer to reach the casualty, especially if there are several other casualties and/or the medic is at another location. The combat lifesaver is trained to provide immediate care which can save a casualty's life, such as stopping severe bleeding and administering intravenous fluids to help control shock.

16-3. IDENTIFY TASKS PERFORMED BY THE COMBAT LIFESAVER

Combat lifesaver training is a bridge between the self-aid/buddy-aid (first aid) training, including the soldier health maintenance (preventive medicine) tasks, given all soldiers during basic training and the medical training given to the combat medic.

The combat lifesaver is proficient in all buddy-aid tasks. Some buddy-aid tasks, such as providing care to a frostbite casualty, have been enhanced to allow the combat lifesaver to provide care to a wider range of injuries (trench foot, generalized hypothermia, etc.).

Other tasks are medical in nature and would normally be performed by the 91W Health Care Specialist (91B Medical Specialist). For example, the combat lifesaver is taught to initiate an intravenous infusion (I.V.) as treatment for hypovolemic shock. Although the combat lifesaver is trained to perform certain medical tasks, he is not trained in all of the tasks that a combat medic performs. For example, the combat medic is trained in cardiopulmonary resuscitation (CPR) while the combat lifesaver is only trained in performing mouth-to-mouth resuscitation. Table 1 contains a listing of the combat lifesaver tasks.

Self-Aid/Buddy-Aid (SABA) Tasks (covered in IS0824)
Clear an object from the throat of a conscious casualty
Perform mouth-to-mouth resuscitation
Put on a field dressing, pressure dressing, and tourniquet
Apply a dressing to an open chest wound
Apply a dressing to an open abdominal wound
Apply a dressing to an open head wound
Prevent shock
Splint a suspected fracture
Give first aid for burns
Recognize and give first aid for heat injuries
Administer first aid to a nerve agent casualty
Transport a casualty using a one-man carry
Transport a casualty using a two-man carry or an improvised litter
Protect yourself against heat
Protect yourself against cold
Protect yourself against biting insects
Protect yourself against diarrhea and dysentery
Practice personal hygiene to maintain fitness
Other Combat Lifesaver Tasks (**covered in IS0825**)
Evaluate a casualty (expanded version of the SABA task, Evaluate the casualty)
Initiate an intravenous infusion for hypovolemic shock
Measure and monitor a casualty's pulse
Measure and monitor a casualty's respirations
Apply a SAM splint to a fractured limb
Insert an oropharyngeal airway in an unconscious casualty
Administer first aid to chemical agent casualties (additional treatment of a nerve agent casualty beyond the SABA task, Administer first aid to a nerve agent casualty, and treatment of injuries due to other types of chemical agents)
Identify and treat cold injuries (includes the SABA task, Give first aid for frostbite)
Manage combat stress reaction (battle fatigue)
Transport a casualty using a military vehicle

Table 1. Combat Lifesaver Tasks

16-4. IDENTIFY MEDICAL SUPPLIES CARRIED BY THE COMBAT LIFESAVER

The combat lifesaver carries a small aid bag containing supplies for dressing wounds, splinting fractures, initiating intravenous infusions, and treating certain minor problems such as the common cold.

The combat lifesaver's aid bag (with contents) weighs a little over nine pounds and occupies about 0.44 cubic feet. The combat lifesaver must be familiar with the contents of his aid bag and how they are used. Table 2 contains a list of the contents of the combat lifesaver medical equipment set (MES) and their uses. The national stock number for the entire combat lifesaver medical equipment set (bag plus all supplies) is **6545 01 254 9551**.

Some items, such as the bags of intravenous fluids, must be replaced when their expiration date nears. Usually, the combat lifesaver's unit will perform the needed stock rotation. If the combat lifesaver maintains his own bag, he must replenish his supplies in accordance with his unit's standing operating procedures (SOP).

During combat, the combat lifesaver will need to be resupplied rapidly as his supplies can be quickly depleted. The combat lifesaver can obtain additional supplies from combat medics, from battalion aid stations or other nearby medical treatment facilities, and from ambulances evacuating casualties.

NSN	NOMENCLATURE	QTY
6510009268882	Adhesive tape, surgical, 1 in	1 SP
6515006878052	Airway pharyngeal, large adult	1
6515009582232	Airway pharyngeal, small adult	1
6505009269083	Atropine injection aqueous type 0.7Ml syringe with needle	5
6510009137909	Bandage adhesive 3/4 X 3 inches flesh	18
6510000583047	Bandage gau4- 1/2"	2
6510002011755	Bandage muslin compressed brown 37 X 37 X 52" triangular w/pins	6
6545009129870	Case medical instrument and supply set polyamide nylon nonrigid	1
6515013156227	Catheter & needle unit, d12 I.V. 18ga radiopaque, disp	2
6505012740951	Diazepam injection USP, 5mg/2ml syringe-needle unit	5
6510001594883	Dressing first aid field camouflaged 4"w X 6.25-7.25"lg, abs	4
6510002017425	Dress FLD 11-3/4IN	1
6515002267692	Gloves, exam lrg	3 PR
6515014721863	Intravenous inj set, 7 comp macrodrip 10 drops/ml	2
6510010100307	Pad povidone-iodine impre, ster 2 X 1.375" brown	12
6510007863736	Pad isopropyl alcohol	12
6505013723425	Sodium Chloride Inj.	2
6510014640826	Sponge Surg 2X2	12
6515009357138	Scissors bandage 1.5"Cut lg. 7.25" O/a lg both blades blunt crs	1
6515012254681	Splint universal 36 X 4.5" malleable alum radiolucent ltwt	1
6515011885316	TUBE DRAIN 1X18"	6
6515014205264	TUBE TRACHEAL	1

TABLE 2. COMBAT LIFESAVER MEDICAL EQUIPMENT SET

Continue with Exercises

PRACTICE EXERCISES: LESSON 16

INSTRUCTIONS: Answer the following exercises by circling the letter of the response that best completes the sentence or which indicates whether the statement is true or false or by writing the answer in the blank provided. After you have answered all of the exercises, check your answers against the "Practice Exercises Solutions" in the Appendix. For each exercise answered incorrectly, reread the lesson material referenced.

1. According to Army battle doctrine, a combat medic will be able to reach a wounded soldier within one minute after the soldier is injured.

a. True.

b. False.

2. During combat, a combat lifesaver sees a fellow soldier collapse. The combat lifesaver must stop his combat duties and administer emergency care to the casualty.

a. True.

b. False.

3. One member of each rifle squad and one member of each tank crew should be a combat lifesaver.

a. True.

b. False.

4. A combat lifesaver receives the same medical training as a combat medic (MOS 91B (W).

a. True.

b. False.

5. A combat lifesaver should be proficient in all first aid (buddy-aid) tasks.

a. True.

b. False.

6. The combat lifesaver's aid bag (medical equipment set) weighs about:

a. Three pounds.

b. Six pounds.

c. Nine pounds.

d. Twelve pounds.

7. During combat, the combat lifesaver can obtain additional medical supplies to replace the supplies which he has used from:

a. A combat medic.

b. A ground ambulance.

c. A nearby medical treatment facility.

d. All of the above.

8. For each item given below, write the number of individual items contained in the combat lifesaver aid bag in the space provided.

a. I.V. bags. _____

b. Muslin bandages. _____

c. Field dressings. _____

d. Atropine autoinjectors. _____

e. CANA. ____

Check Your Answers on Next Page

LESSON 16 PRACTICE EXERCISE SOLUTIONS

1. b (para 16-1)

2. b (para 16-1)

3. a (para 16-1)

4. b (para 16-2)

5. a (para 16-2)

6. c (para 16-3)

7. d (para 16-3)

8. a. 2
   b. 4
   c. 6
   d. 5
   e. 5 (Table 2. Combat Lifesaver Medical Equipment Set)

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LESSON 17
INITIATE AN INTRAVENOUS INFUSION FOR HYPOVOLEMIC SHOCK

TASK

Initiate an intravenous infusion (I.V.).

CONDITIONS

Given a simulated casualty and needed supplies.

STANDARD

Score a GO on the performance checklist.

REFERENCES

FM 21-11, First Aid for Soldiers.
STP 8-91B15-SM-TG, MOS 91B Medical Specialist, Skill Levels 1/2/3/4/5.
STP 21-1-SMCT, Soldier's Manual of Common Tasks, Skill Level 1.

17-1. INTRODUCTION

The most important tasks of the combat lifesaver are to control hypovolemic (low blood volume) shock by controling hemorrhage and initiating an intravenous infusion (I.V.). The I.V. fluid replaces fluid lost from the casualty's circulatory system. The I.V. fluids contain both water and electrolytes (sodium, potassium, calcium, and chloride compounds). Left untreated, hypovolemic shock can result in death.

17-2. IDENTIFY SIGNS AND SYMPTOMS OF HYPOVOLEMIC SHOCK

Hypovolemic shock is a condition caused by a sudden decrease in volume of fluid in the body's blood circulatory system. On the battlefield, severe blood loss or severe burns usually bring about this condition. Hypovolemic shock can also be caused by dehydration due to severe vomiting, diarrhea, or profuse sweating (heat injury). Watch for signs and symptoms of hypovolemic shock if any trauma resulting in a significant loss of body fluids occurs. When indications of hypovolemic shock are present, take steps to replace lost body fluids by initiating an intravenous infusion (I.V.). The quicker the casualty receives I.V. fluids, the more rapid the improvement in his condition. Signs and symptoms of hypovolemic shock include the following:

Rapid or severe bleeding:

External bleeding from a visible wound.

Internal bleeding from a trauma with no visible wound (usually seen as swelling or discoloration).

Severe burns (second and third degree burns over 20 percent or more of the casualty's skin surface).

Anxiety. (This is an early sign of shock. As fear increases, the heart rate increases, which usually causes the casualty's overall condition to deteriorate.)

Confusion. (The casualty may not understand his surroundings and take inappropriate actions. This condition is generally caused by lack of oxygen to the brain. To test the casualty, ask questions which cannot be answered with a simple "yes" or "no." For example: "What is your name? What is the month and year? What day of the week is it?")

Restlessness. (The casualty may have a strong desire to move about or leave.)

Agitation. (The casualty may become agitated to the point of violent behavior and attack people around him.)

Changes in the level of consciousness. (The casualty may quickly go from fully alert to unconscious.)]

Changes in the level of consciousness. (The casualty may quickly go from fully alert to unconscious.)]

Abnormal pulse (irregular or fluctuating pulse in early stages; weak and rapid pulse in later stages).

Pulse rate over 100 beats per minute.

Low blood pressure (indicated by difficulty in detecting a radial pulse).

Cool, clammy skin.

Change in skin color:

- Blotchy or bluish skin, especially around the mouth.
- Pale and yellowish coloration in light-skinned individuals.
- Grayish lips and fingernail beds in dark-skinned individuals.
- Extreme paleness or grayish color of the casualty's eyelids and the inside of his lips.

Rapid, shallow breathing.

Thirst, dry mouth.

Nausea or vomiting.

17-3. PERFORM PRELIMINARY MEASURES TO TREAT A CASUALTY FOR HYPOVOLEMIC SHOCK

Evaluate the casualty. Maintain the airway, if necessary.

Control any external bleeding.

Normally, you will position the casualty on his back and elevate his feet above the level of his heart level to increase the blood flow to the heart.

If you suspect the casualty has a fractured thigh, leg, or ankle, do not elevate the legs until the suspected fracture has been splinted. Initiate the I.V. before splinting the fracture.

If the casualty has an open chest wound, position him on his side with the wounded side next to the ground.

If the casualty has an open abdominal wound, flex the knees.

If the casualty has an open head wound, allow the casualty to sit up or position him on his side with the wound away from the ground.

If the casualty is on a litter, elevate the foot of the litter if the casualty has no open abdominal or open head injury.

If you must leave the casualty or if he is unconscious, turn his head to one side to prevent him from choking should he vomit.

Avoid rough and excessive handling.

Loosen any restrictive clothing from around the neck, waist, or other areas where it might be binding.

CAUTION: Do not loosen or remove the casualty's clothing if you are in a chemically contaminated area.

WARNING

Do not give the casualty anything to eat or drink since it could cause vomiting. If the casualty vomits, he could inhale his own vomitus and suffocate. You may moisten the casualty's lips with a damp cloth.

Initiate an intravenous infusion to replace lost fluids.

Maintain the casualty's normal body temperature.

In cool temperatures, place the casualty on a poncho and cover him with the sides of the poncho. Use a wool blanket if you have one. Do not allow the casualty to lie in water.

In hot or warm temperatures, do not cover the casualty unless he shows signs of chilling. Place him in the shade and/or try to shield him from direct sunlight.

Watch the casualty for signs of sweating or chilling. Remove covering if the casualty is sweating. Cover the casualty if he shows signs of chilling.

CAUTION: If a tourniquet has been applied, leave it exposed so medical personnel can see it quickly.

Check the casualty's pulse and respirations as often as possible to determine if he is responding to treatment. Also monitor the casualty's level of consciousness and changes in skin color.

17-4. PUT ON GLOVES

Cleanliness is the main reason for wearing gloves when you initiate an I.V. In battle, you and your casualty may be smeared with dirt, sand, mud, or blood. The gloves will reduce the chance of various possible infections resulting from the I.V. puncture for both you and the casualty.

In addition to the cause for cleanliness, the gloves should be used because it is impossible to know which casualties are infected with conditions such as HIV, HBV, or other bloodborne diseases.

Always dispose of needles properly. In the combat setting push needles into the ground. This way, no one runs the risk of an accidental needle stick.

If, for some reason, you cannot wear the gloves, start the I.V. anyway.

17-5. GATHER AND CHECK I.V. SUPPLIES

Obtain the following supplies from your aid bag:

I.V. solution bag.

Intravenous infusion set.

Catheter and needle unit (also called over-the-needle catheter or catheter/needle unit).

NOTE: In a combat situation, you may be resupplied with an I.V. solution bag and/or an I.V. set different from the ones shown in class.

Constricting band (tubing).

Antimicrobial (povidone-iodine) ointment.

Povidone-iodine impregnated cotton pads.

Alcohol Pads

Gauze sponges

Adhesive tape.

Scissors.

Remove the I.V. solution bag from its protective cover and check the bag for:

Expiration date. (Do not use outdated solutions.)

Clarity of the fluid. (Make sure the fluid is clear and has no floating particles in the solution.)

Leaks. (Discard any leaky bag. The I.V. solution inside is no longer sterile.)

CAUTION: If there is any doubt about the sterility of the solution, do not use it. Obtain another solution bag.

Check the packaging of the I.V. set and catheter and needle unit for tears and water marks. Tears and watermarks indicate the set or the catheter and needle unit may no longer be sterile. Obtain another set or needle unit.

Remove the I.V. set from its box or package and check the tubing for tears, discoloration, and cracks. Obtain another set if the tubing is discolored or damaged.

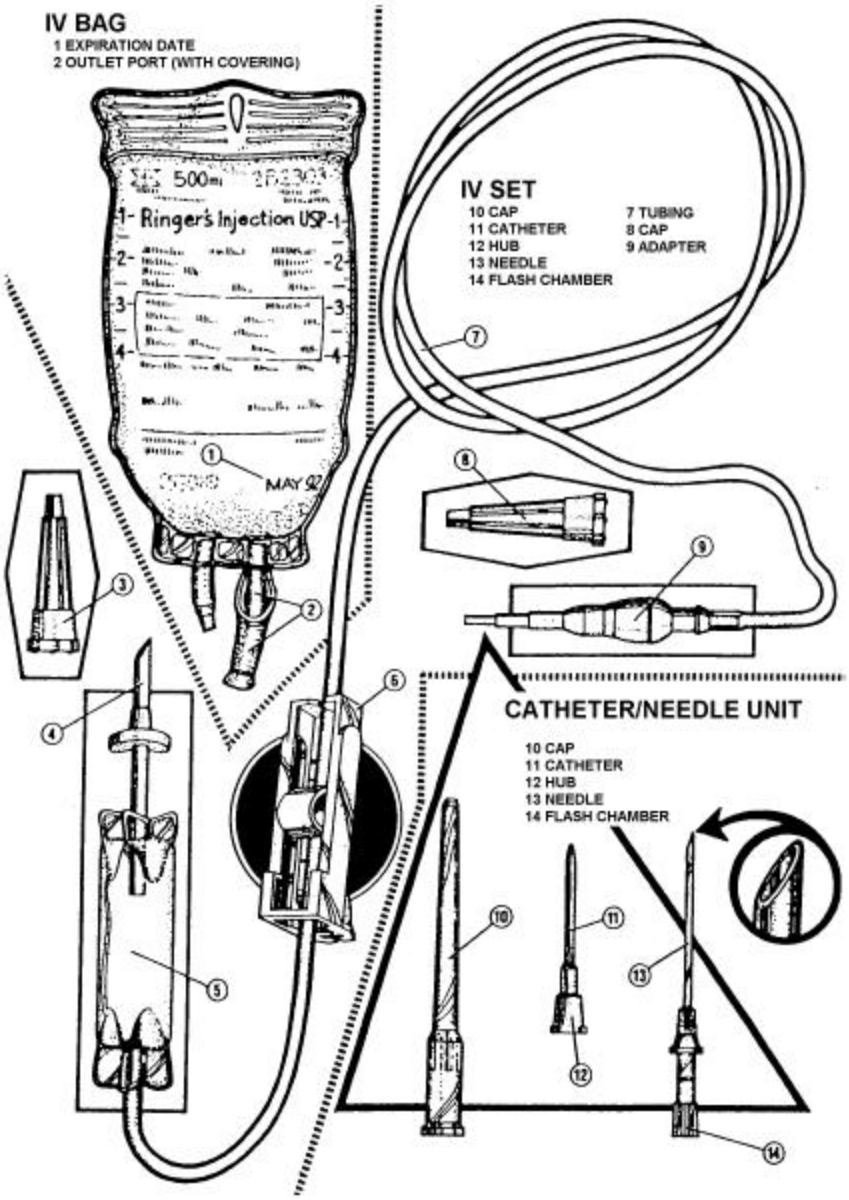

FIGURE 17-1. I.V. BAG, I.V. SET, AND CATHETER/NEEDLE UNIT

17-6. PREPARE THE I.V.

NOTE: The procedures may have to be altered slightly depending upon the type of supplies being used.

After removing the infusion set from the package and checking it for damage, move the clamp along the tubing until it is 6 to 8 inches from the drip chamber. Tighten the clamp once it is in position.

Remove the protective covering from the outlet port (long spout) on the I.V. bag. Do not let the tip of the outlet port touch anything until the spike is inserted.

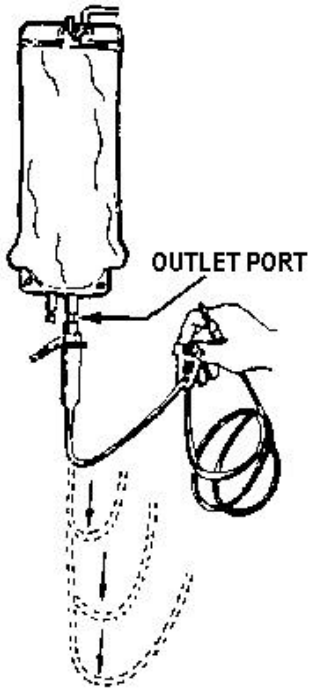

FIGURE 17-2. REMOVING AIR FROM THE TUBING

Remove the protective cap from the spike on the infusion set. Grasp the drip chamber with one hand and the spike cap with the other hand. Remove the cap with a twisting motion without touching the spike.

Insert the spike into the exposed I.V. outlet port with a twisting motion. The spike will penetrate the seal in the outlet port. Do not touch the end of the port or the spike during the procedure.

Hang the bag on an object above the level of the casualty's heart, if possible, or hold the bag up until you have completed removing air from the tubing.

Squeeze the drip chamber until half of the chamber is filled with I.V. solution.

Remove the air from the tubing.

Hold the end of the tubing above the bottom of the bag.

Release or loosen the tubing clamp. (This allows the fluid to flow into the tubing.)

Loosen the protective cap over the adapter. (This allows the air to escape from the tubing.)

Gradually lower the tubing until the solution reaches the end of the adapter.

Reclamp the tubing and retighten the cap over the adapter.

NOTE: In the classroom, loop the tubing over the I.V. stand, if used, to protect it from contamination while you prepare the I.V. site.

WARNING

If air is not removed from the tubing, it can enter the bloodstream and rapidly move to the heart (air embolism). An air embolism can cause the casualty's heart to stop beating (cardiac arrest). It is essential that you make sure there is no air in the tubing.

Cut or tear four strips of tape (about 4-inches in length) and hang them on the bag.

17-7. SELECT AND PREPARE AN INFUSION SITE

Expose possible infusion sites by removing, tearing, or cutting away clothing if necessary.

Look and feel (palpate) for a vein. The vein should be as close to the end of the extremity as possible. Make sure the site is free of scars, moles, and excessive hair.

Avoid joints, areas where a pulse is palpable, and veins near or below injuries.

Select a straight vein, one that feels springy when touched and does not roll.

If you have difficulty finding a vein, lower the arm below the level of the heart. If you still cannot find a vein on the arm or hand, try to find a vein on the foot. If this fails, try to find a vein on the leg.

CAUTION: Attempt to penetrate the vein at the most distal point (the one closest to the end of the extremity, farthest away from the heart) that is practical. If you are unsuccessful the first time, move toward the heart for your second attempt. The arm is the most convenient place for performing this procedure.

Apply the constricting band (tubing) 6 to 8 inches above the infusion (venipuncture) site in such a manner that the band can be released using only one hand.

Stretch the band slightly.

Wrap the band around the limb so that one end of the remaining band is longer than the other end.

Loop the longer end and draw it under the shorter end. Be sure the tails point away from the infusion site

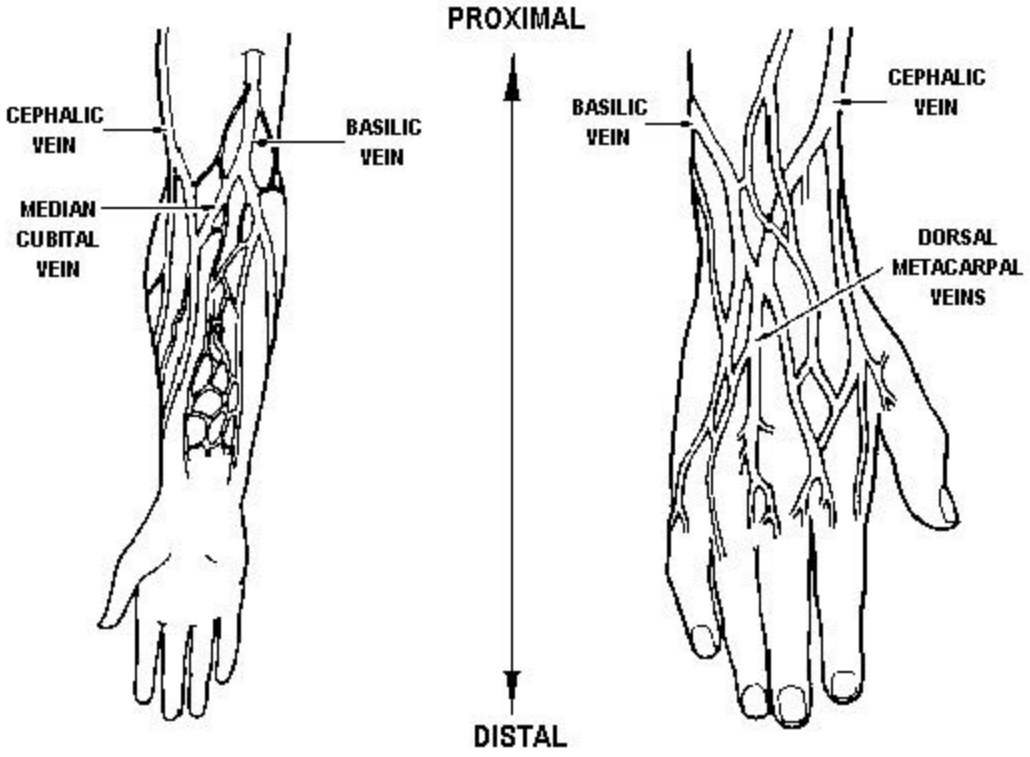

FIGURE 17-3. VEINS ON THE FOREARM AND HAND

WARNING

The constricting band <u>should not</u> remain in place more than <u>two</u> minutes.

Ask the casualty (if conscious) to clench and relax his fist several times, then keep his fist clenched. If the casualty is unconscious, place the limb below the level of heart.

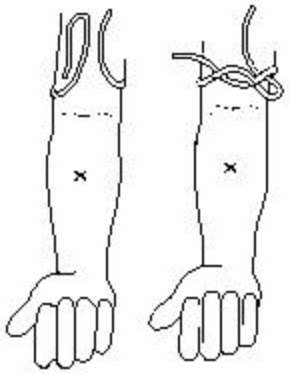

FIGURE 17-4. APPLYING A CONSTRICTING BAND

Palpate the vein with your fingertips again (after the clenching) to make sure that the vein is still suitable.

Open a packet containing a povidone-iodine impregnated cotton pad and cleanse the skin at the selected infusion site. Wipe the site using a circular motion, beginning at the center of the site and spiraling outward.

Open a packet containing an alcohol pad and make one pass directly over the vien from proximal to distal, removing the povidone-iodine to facilitate the visualization of the vein. Let the alcohol dry and do not palpate the vein again or touch the site after cleansing

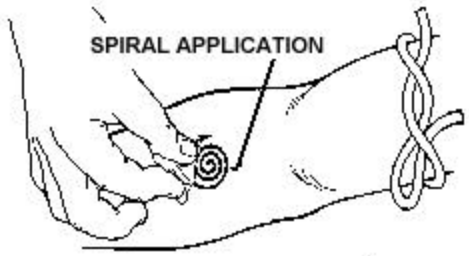

FIGURE 17-5. CLEANSING THE INFUSION SITE

17-8. INITIATE INFUSION

Place the tubing so that the needle adap is within easy reach.

Open the packaging of the catheter and needle unit and remove the unit.

Hold the stem (flash chamber) of the unit with the thumb and forefinger of your dominant hand (the hand with which you write) and use your other hand to remove the protective cap from the unit. Hold the unit so the bevel of the needle is up.

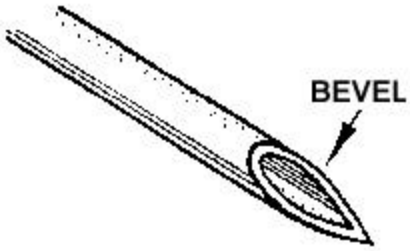

FIGURE 17-6. NEEDLE WITH BEVEL UP

CAUTION: Do not touch the exposed needle or catheter.

Pull the skin taut by pressing approximately one inch above or below (usually below) the infusion site with the thumb of your nondominant hand.

Position the needle slightly to the side of the vein at approximately a 20° to 30° angle.

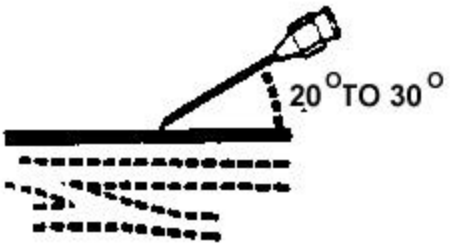

FIGURE 17-7. INSERTING THE BEVEL INTO THE SKIN

Insert the needle tip into the skin with the bevel up. Insert only the bevel of the needle beneath the skin.

Lower the angle of the catheter and needle until it is almost parallel to the skin surface.

Insert the needle into the vein. A slight "give" is felt as the needle enters the vein.

Check for blood in the flash chamber. If the needle is in the vein, blood will appear in the flash chamber.

> If the venipuncture (penetration of the vein) is not successful, pull the catheter and needle unit back slightly, but do not pull the bevel above the skin surface. Attempt to direct the needle point into the vein again.
>
> If you are still unsuccessful, release the constricting band, withdraw the catheter and needle completely, obtain another catheter and needle unit, and attempt another venipuncture at a point proximal to (above) the previous attempt.
>
> If you are still unsuccessful after the second venipuncture attempt, obtain medical assistance, if available. Do not attempt another venipuncture. If medical assistance is not available, evacuate the casualty as soon as practical.

When you have blood in the flash chamber, hold the catheter and needle unit in place.

Advance the catheter and needle unit approximately 1/8 inch farther to ensure that the catheter itself is in the vein.

Stabilize the flash chamber with your dominant hand. Grasp the catheter hub with your nondominant hand.

Thread the entire length of the catheter into the vein (to the hub).

> **CAUTION:** Only the catheter is advanced into the vein. The needle is not advanced.

While continuing to hold the catheter hub with your nondominant hand, press lightly on the skin over the catheter tip with a finger of the same hand. (Pressing lightly on the skin over the catheter tip is necessary in order to decrease or stop the flow of blood from the catheter hub after the needle is removed.)

With your dominant hand, remove the flash chamber with the attached needle from the catheter and lay the flash chamber/needle aside.

Ask the casualty to unclench his fist.

Without switching hands, release the constricting band.

Remove the protective cap from the adapter with your dominant hand and quickly insert the tip of the adapter tightly into the catheter hub.

Relax the finger which was pressing on the skin over the catheter.

WARNING

After the needle is removed, do not attempt to reinsert it into the catheter. Reinsertion could cause a portion of the catheter to be sheared off, enter the bloodstream, and move to the heart where it could cause cardiac arrest.

Loosen the clamp on the tubing to allow the I.V. solution to flow.

Check the drip chamber to make sure the flow has started.

Adjust the clamp so the I.V. tubing is clamped (constricted) about half way. The fluid should be flowing fast enough that you can barely count the individual drops of fluid.

WARNING

If head injuries are present, run the I.V. as slowly as possible (about ten drops per minute), but keep the solution flowing.

Check the infusion site for signs of infiltration (fluids going into the tissues rather than the vein). The signs of infiltration are:

Unusual pain felt by casualty at site of infusion.

Swelling at the site of the infusion.

Redness at the site of the infusion.

Site is cool to the touch.

Clear fluid leaking around the site.

WARNING

If signs of infiltration are present, clamp the I.V. tubing, remove the catheter from the casualty, obtain a new catheter and needle unit, and attempt the infusion at a site above the last attempt.

If infiltration is not present, proceed to secure the catheter and I.V.

17-9. SECURE THE I.V.

Remove two strips of tape from the I.V. bag and use them to make a diagonal cross over the catheter hub. Once the hub is secured, release your hold on the adapter.

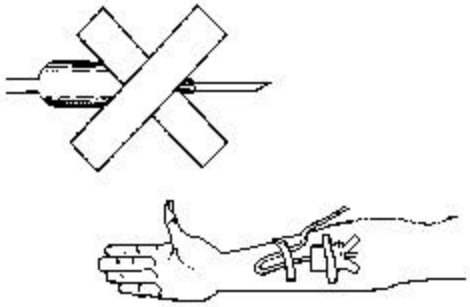

FIGURE 17-8. SECURING THE I.V.

Place a gauze pad over the infusion site. Open the package and place the gauze pad over the hub and adapter.

Use one piece of tape to secure the adapter. (The tape is placed across the adapter if a gauze pad is not used. If a gauze pad is applied, secure both the pad and the adapter with the tape.)

Make a loose safety loop of tubing on top of the extremity with the tubing below (distal to) the infusion site.

Secure the loop of tubing with the fourth piece of tape.

Position the I.V. bag so the fluid will continue to flow from the I.V. bag into the casualty's vein.

> If possible, hang the bag from a stable object with the bag higher than the casualty's heart. Gravity will cause the fluid to flow.
>
> If the bag cannot be hung, place the bag under the casualty's lower back. Be sure that the drip chamber is completely full to prevent the introduction of air into the venous system. The pressure from the casualty's body will force fluid from the bag. This method can be used when evacuating the casualty on a litter.

17-10. REMOVE THE CATHETER

If the infusion site becomes infiltrated, fluid in the I.V. bag is used up, or you must stop the infusion for any reason, use the following steps to remove the catheter.

Adjust the clamp on the tubing so the flow of fluid is stopped.

Loosen and remove the strips of tape. Remove the tape from the loop of tubing; then the strip of tape securing the adapter; then the two strips of tape securing the catheter hub. When removing a strip of adhesive tape, start at the ends of tape and loosen toward the middle.

Remove the catheter from the vein by pulling it out at the same angle used in inserting the needle (almost parallel to the skin).

Cover the puncture site with an adhesive bandage from your aid bag. (The small, sterile dressing on the adhesive bandage will help to stop bleeding and prevent infection.)

Apply manual pressure over the site for about 5 minutes to help control bleeding. (This step may be performed by the casualty.) Antimicrobial ointment and a self-adhesive bandage can also be applied.

The performance checklist following the practice exercis is provided for three reasons. First, it is a review of the procedures given in this lesson. Second, it allows you to become familiar with a checklist similar to the one which will be used to evaluate your performance. Third, it allows you to practice on an I.V. training device with another student evaluating your performance. DO NOT ATTEMPT TO TRAIN ON ANOTHER PERSON WITHOUT PROPER CLASSROOM SUPERVISION.

Study the performance checklist for administering an I.V.

Continue with Exercises

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PRACTICE EXERCISES: LESSON 17

INSTRUCTIONS: Answer the following exercises by writing the required term in the blanks provided or by circling the proper word choice. After you have completed all of the exercises, check your answers against the "Practice Exercises Solutions". For each exercise answered incorrectly, reread the lesson material referenced.

1. List ten signs/symptoms of hypovolemic shock:

   a. _____ f. _____

   b. _____ g. _____

   c. _____ h. _____

   d. _____ i. _____

   e. _____ j. _____

SPECIAL INSTRUCTIONS: For the remaining exercises, assume the casualty is breathing adequately, you have controlled the bleeding from an injured leg, and you have determined the casualty is suffering from hypovolemic shock. The casualty has no other injury.

2. Position the casualty on his _____.

3. Elevate his legs above the level of his_____.

4. Be careful to avoid _____ handling.

5. Loosen any restrictive clothing unless you are in a _____.

6. (Do/Do not) give him food or drink._____ his lips, if needed.

7. Initiate an intravenous infusion to _____.

8. The most important reason for wearing gloves is _____.

9. After gathering the equipment you will need for an I.V., check the solution bag for _____, and _____.

10. If the infusion set has_____, or _____, discard it and use a new one.

11. The clamp on the tubing should be _____to _____ inches from the drip chamber before you tighten it.

12. Remove the spike protective cap with a_____ motion and insert the spike into the outlet port with a_____ motion without touching the end of the port or spike.

13. Hold the solution bag _____ than the casualty's _____.

14. Squeeze the drip chamber until it is_____ full.

15. Remove the air from the tubing by holding the tubing above the bag, loosening the and the _____,gradually lowering the tubing until the solution reaches the, and retightening the _____and the_____.

16. Hang _____ 4-inch pieces of tape from the bag.

17. Select an infusion site as close to the_____ of the extremity as possible. The site should be clear of _____,_____, and _____.

18. Select a vein that feels springy and does not _____.

19. Wrap the constricting band _____ to ____inches above the venipuncture site. The constricting band should remain in place no longer than _____ minutes.

20. Tell the casualty to _____ his fist several times.

21. Cleanse the site using a _____ motion from the _____ of the site and moving _____and uses isopropyl alcohol pad to wipe the site once from proximal to distal.

22. Hold the catheter and needle unit in your (dominant/nondominant) hand and remove the needle cover.

23. Pull the skin taut with the thumb of your (dominant/nondominant) hand, position the needle slightly to the side of the vein at a _____ to _____ - degree angle with the bevel ___. After inserting the bevel, position the needle so it is almost _____ to the skin.

24. When the needle is in the vein, _____ will appear in the _____.

25. When the needle is in the vein, advance the catheter/needle unit about _____ inch farther to be sure the catheter is in the vein.

26. Thread the catheter into the vein, press lightly on the skin over the _____, and remove the _____.

27. Have the casualty unclench his fist, remove the _____, remove the adapter cap, and insert the adapter tip quickly and tightly into the_____.

28. Loosen the clamp and check the _____ to be sure the flow has started.

29. Run the I.V. about _____.(If the casualty had a head injury, you would run it at about _____ drops per minute).

30. When fluids go into the _____ rather than the vein, infiltration has occurred.

31. Five signs of infiltration at the infusion site are: _____ , _____,

_____, _____, and _____ leaking around the site.

32. If signs of infiltration are present,_____ the catheter and try again at a site __ _____ the last site.

33. Four pieces of tape are used to secure the I.V. Two are diagonally crossed over the one piece is used to secure the _____, and the fourth piece is used to secure the

34. When removing a catheter, pull it out at an angle almost _____ to the skin.

Check Your Answers on Next Page

LESSON 17 PRACTICE EXERCISE SOLUTIONS

1. Any ten of the following:
   Rapid or severe bleeding.
   Severe burns.
   Anxiety.
   Changes in the level of consciousness.
   Confusion.
   Restlessness.
   Agitation.
   Irregular or fluctuating pulse (early stage).
   Weak and rapid pulse (later stage).
   Low blood pressure.
   Cool, clammy skin.
   Change in skin color.
   Enlarged pupils.
   Rapid, shallow respirations.
   Thirst, dry mouth.
   Nausea or vomiting.
   Pulse rate over 100. (para 17-2)

2. back. (para 17-3)

3. heart. (para 17-3)

4. rough, excessive. (para 17-3)

5. chemical (or chemically-contaminated) environment. (para 17-3)

6. Do not; Moisten. (para 17-3)

7. replace lost fluids. (para 17-3)

8. cleanliness. (para 17-4)

9. passed expiration date, fluid clarity, leaks. (para 17-5)

10. cracks, discoloration, tears. (para 17-5)

11. 6; 8. (para 17-6)

12. twisting; twisting. (para 17-6)

13. higher; heart. (para 17-6)

14. half. (para 17-6)

15. clamp, adapter cap; end of the adapter; clamp, adapter cap; (para 17-6)

16. four. (para 17-6)

17. end; scars, moles, excessive hair. (para 17-7)

18. roll. (para 17-7)

19. 6, 8; 2. (para 17-7)
20. clench and relax. (para 17-7)
21. circular (or spiraling); center; outward. (para 17-7)
22. dominant. (para 17-8)
23. nondominant; 20, 30; up; parallel. (para 17-8)
24. blood; flash chamber. (para 17-8)
25. 1/8. (para 17-8)
26. catheter tip; flash chamber/needle. (para 17-8)
27. constricting band; catheter hub. (para 17-8)
28. drip chamber. (para 17-8)
29. half open; 10. (para 17-8)
30. surrounding tissues (flesh). (para 17-8)
31. pain; swelling; redness; coolness; clear fluid. (para 17-8)
32. remove; above (proximal to). (para 17-8)
33. catheter hub; adapter; safety loop of tubing. (para 17-9)
34. parallel. (para 17-10)

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PERFORMANCE CHECKLIST

INITIATE AN INTRAVENOUS INFUSION

Situation: A casualty is in hypovolemic shock. You have taken care of any major wounds and are preparing to administer fluids intravenously.

	GO	NO GO
Puts on gloves.	_____	_____
Removes protective covering from I.V. bag and checks for passed expiration date, leaks, and clarity of solution.	_____	_____
Removes infusion set from box, checking for cracks, watermarks, etc.	_____	_____
Moves clamp on tubing 6 to 8 inches from the drip chamber and tightens the clamp.	_____	_____
Removes protective covering from outlet port without touching port tip.	_____	_____
Removes spike protective cap on infusion set with twisting motion without touching spike.	_____	_____
Inserts spike fully into I.V. outlet port with a twisting motion without touching the spike or port tip.	_____	_____
Holds (hangs) bag up and fills the drip chamber half full by squeezing drip chamber.	_____	_____
Holds tubing above bottom of bag.	_____	_____
Loosens clamp on tubing and loosens protective cap over the adapter.	_____	_____
Gradually lowers tubing until solution reaches the tip of the adapter.	_____	_____
Reclamps tubing and retightens cap on adapter.	_____	_____
Protects I.V. tubing (loop over stand, etc.)	_____	_____
Tears/cuts four strips of tape and hangs strips on bag.	_____	_____
Looks and feels for vein (usually on arm or hand).	_____	_____
Selects appropriate vein for infusion (not over a joint: free of scars, moles, and hair; etc.).	_____	_____
Applies constricting band 6 to 8 inches above site in the manner described in the subcourse.	_____	_____

	GO	NO GO
Instructs casualty to clench and relax his fist several times, then to leave fist clenched.	_____	_____
Palpates selected vein again.	_____	_____
Opens a povidone-iodine impregnated cotton pad and cleanses the selected infusion site, beginning at the center of the site and spiraling outward. Uses an alcohol pad to wipe the site once from proximal to distal.	_____	_____
Does not touch the site after cleansing.	_____	_____
Removes protective cap from catheter and needle unit without touching the needle or catheter.	_____	_____
Pulls skin taut by pressing approximately one inch above or below injection site with thumb of nondominant hand.	_____	_____
Positions needle with bevel up slightly to side of the selected vein at a 20° to 30° angle.	_____	_____
Inserts bevel of needle into skin.	_____	_____
Lowers angle to almost parallel to skin surface.	_____	_____
Advances catheter and needle alongside vein and inserts needle into vein.	_____	_____
Checks flash chamber for blood.	_____	_____
(If no blood present in chamber, withdraws catheter and needle slightly and inserts the needle into the vein.)	_____	_____
Advances catheter and needle unit 1/8 inch farther to ensure the catheter is in vein.	_____	_____
Threads the catheter into vein to hub without advancing the needle.	_____	_____
Presses lightly on skin over catheter.	_____	_____
Removes flash chamber/needle.	_____	_____
Asks casualty to unclench fist and releases constricting band.	_____	_____
Constricting band has not been in place for more than 2 minutes.	_____	_____
Removes adapter cap and inserts adapter into catheter hub.	_____	_____
Opens clamp about half way (simulated in performance test).	_____	_____
Checks flow of solution into drip chamber and adjusts clamp if needed (simulated in test).	_____	_____

	GO	NO GO
Checks for infiltration by asking casualty about pain and checking site for swelling, redness, coolness, and leaking of clear fluid.	_____	_____
Secures hub by making a diagonal cross over hub using two strips of tape.	_____	_____
Secures adapter with a strip of tape.	_____	_____
Loops tubing on extremity distal to infusion site and secures looped tubing with tape.	_____	_____
Checks for infiltration again.		
(If infiltration is present, discontinues I.V. and tries again at a proximal site.)	_____	_____
Sterility maintained with no additional injury to the casualty.	_____	_____
Question: What should you do if the infusion site is red and cool to the touch?		
Answer: _____	_____	_____
_____		
_____		
OVERALL EVALUATION (A no go on any step gives an overall evaluation of NO GO for. the entire task.)	GO _____	NO GO _____

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LESSON 18
MEASURE AND MONITOR A CASUALTY'S PULSE

TASK

Determine a casualty's pulse rate and describe the characteristics of the pulse.

CONDITIONS

Given a simulated casualty and a timepiece with a second hand.

STANDARD

Score a GO on the performance checklist.

REFERENCES

FM 21-11, First Aid for Soldiers.
STP 8-91-SM, Soldier's Manual: CMF 91: General Medical Tasks.

18-1. INTRODUCTION

Pulse is used to measure the casualty's heartbeat rate. When the heart contracts (pumps blood), a pulse is created in the arteries which can be felt and counted. The pulse is a result of a brief expansion of the artery that occurs with each heartbeat. The normal adult heart rate ranges from 60 to 80 beats per minute with an average rate of 72.

18-2. LOCATE THE PULSE SITE

The pulse can usually be felt (palpated) most easily at a location where an artery crosses a bony area. There are several locations at which a casualty's pulse is taken (pulse beats counted). Three commonly used pulse sites are found at the carotid (neck) artery, the radial (wrist) artery, and the femoral artery. The name of the artery is used when referring to the pulse site. For example, the pulse is taken at the carotid artery is called the carotid pulse.

a. Carotid Pulse Site

The carotid pulse is taken at a groove along the casualty's larynx (Adam's apple) containing a carotid artery. There are two (right and left) carotid arteries. The right carotid artery is located in a groove on the right side of the larynx and the left carotid artery is located in a groove on the left side of the larynx. Either artery can be used to take the casualty's carotid pulse. The carotid pulse site is a preferred location because the carotid artery is a central artery and is usually accessible without removing the casualty's clothing.

WARNING

DO NOT APPLY PRESSURE TO BOTH CAROTOID ARTERIES AT THE SAME TIME

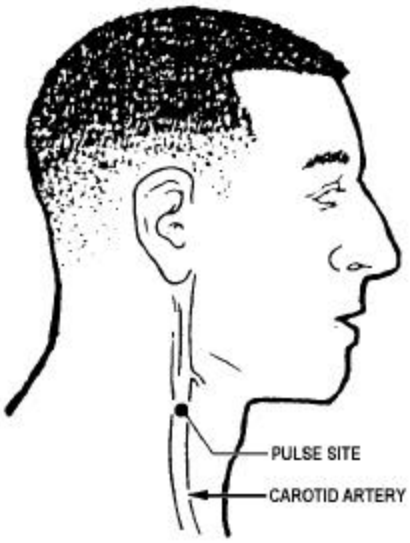

FIGURE 18-1. CAROTID PULSE SITE

b. Radial Pulse Site

The radial pulse is located on the inside of the wrist near the base of the thumb. Do not use the back of the wrist. Either wrist can be used.

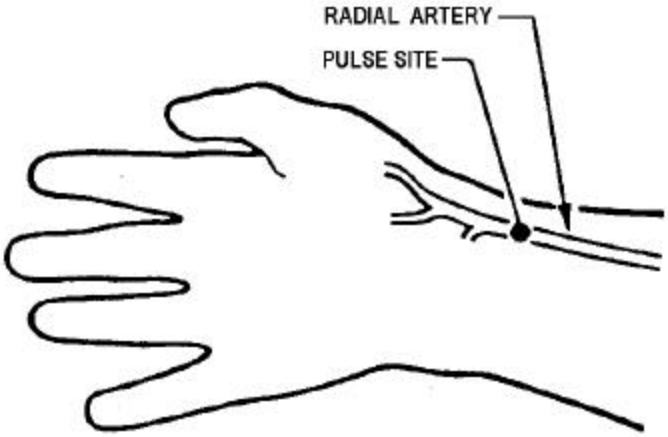

FIGURE 18-2. RADIAL PULSE SITE

c. Other Pulse Sites

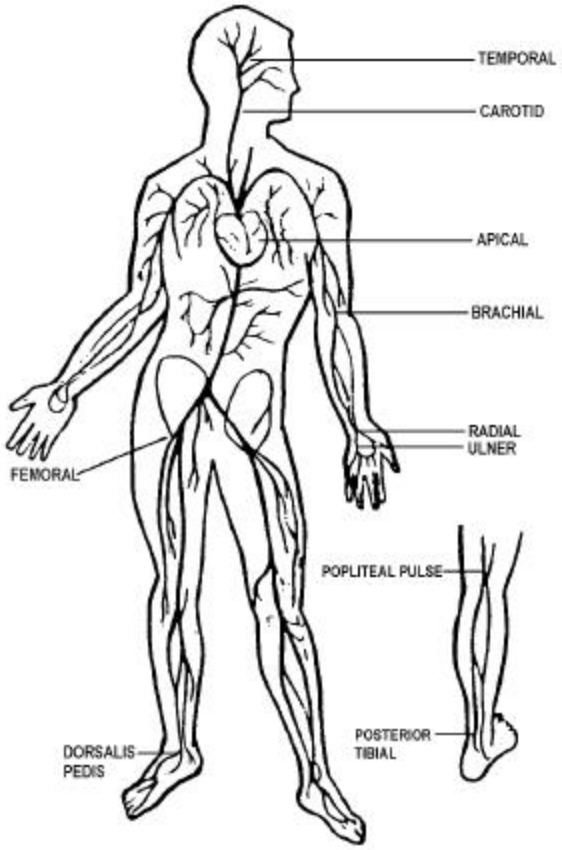

FIGURE 18-3. OTHER PULSE SITES

The temporal pulse is felt at the temple near the ear. The brachial pulse is felt on the inside of the elbow. The femoral pulse is felt in the groin area. The popliteal pulse is felt behind the knee. The dorsalis pedis pulse is felt on top of the foot. A pulse may also be felt directly over the heart on the left side of the casualty's chest. This pulse is called the apical pulse.

18-3. TAKE THE CASUALTY'S PULSE

Changes in a casualty's pulse directly reflect changes in his heart rate. Making an accurate assessment of the pulse is important.

NOTE: "Normal" pulse rate and strength may vary from individual to individual.

a. Palpate the Pulse Site

Place the tips of your index and middle fingers over the pulse site and press gently. Too much pressure on the artery could interfere with blood circulation and stop the pulse.

CAUTION: Do not place your thumb on the pulse site. The thumb has its own pulse. If you use your thumb, you may be taking your own pulse rather than the casualty's pulse.

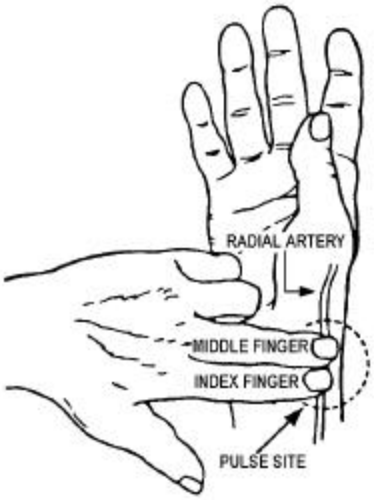

FIGURE 18-4. PALPATING THE RADIAL PULSE SITE

b. Count the Pulse Beats for One Minute

Using a clock with a second hand, count the pulse for one full minute.

A normal pulse rate for an adult when resting is from 60 to 80 beats per minute. The average is 72 beats per minute.

A higher than normal pulse rate (a resting pulse rate of over 80 beats per minute) can be caused by several factors including shock, bleeding, excessive heat, dehydration, fever, pain, emotions, and vigorous activity (such as running).

Tachycardia is an abnormal condition that exists when the casualty's pulse rate is over 100 beats per minute.

A lower than normal pulse rate (a resting pulse rate of less than 60 beats per minute) can be caused by several factors, including heart disease and medications. A pulse rate below 60 may also occur in a soldier who is physically fit.

A pulse rate of less than 50 beats per minute is called bradycardia.

c. Classify the Strength of the Pulse

A regular pulse is easy to feel and has even beats of good force.

A bounding pulse is one that is easily detected due to the exceptionally large amount of blood being pumped with each heartbeat.

A weak pulse is difficult to detect due to a decreased amount of blood flowing through the arteries, usually due to bleeding or shock.

An absent pulse cannot be detected. Lack of a detectable pulse may indicate that the artery is blocked or injured.

CAUTION: If no pulse or only an indistinct pulse is felt at the radial or posterior tibial site, palpate the carotid pulse site. The carotid pulse site is less likely to be blocked or severely weakened due to trauma or disease. If the carotid pulse cannot be found, try to feel the apical pulse.

18-4. MONITOR THE CASUALTY'S PULSE

Continue to take the casualty's pulse periodically as needed. Report abnormal readings or any significant changes in rate and/or strength to medical personnel.

Performance checklist

Continue with Exercises

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PRACTICE EXERCISES: LESSON 18

INSTRUCTIONS: Answer the following exercises by writing the missing word or words in the blank provided. After you have answered all of the exercises, check your answers against the "Practice Exercises Solutions". For each exercise answered incorrectly, reread the lesson material referenced.

1. The _____ pulse is located in the_____ along the Adam's apple.

2. The _____ pulse is located on the _____ of the wrist near the base of the thumb.

3. The apical pulse is located _____.

4. To palpate the pulse, use your _____and _____ fingers, not your _____.

5. The normal pulse rate for a resting adult is_____ to _____ beats per minute.

6. _____ is a pulse rate over 100 beats per minute.

7. _____ is a pulse rate under 50 beats per minute.

8. A _____ pulse is unusually easy to detect due to the large amount of blood being pumped with each beat.

Check Your Answers on Next Page

LESSON 18 PRACTICE EXERCISE SOLUTIONS

1. carotid; groove. (para 18-2a)
2. radial; inside. (para 18-2b)
3 over the heart. (para 18-2c)
4 middle, index; thumb. (para 18-3a)
5 60 to 80. (para 18-3b)
6 Tachycardia. (para 18-3b)
7 Bradycardia. (para 18-3b)
8 bounding. (para 18-3c)

See checklist.

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PERFORMANCE CHECKLIST

TAKE A CASUALTY'S PULSE

Situation: You are going to take a casualty's pulse to determine heart rate, pulse rhythm, and pulse strength. Take the casualty's pulse using the radial, posterior tibial, and carotid arteries. Use a wristwatch or other clock with a second hand. If possible, have an experienced person available to verify your results.

	GO	NO GO
Has casualty sit or lie down.	_____	_____
Locates carotid pulse site in the groove along the casualty's neck.	_____	_____
Counts casualty's pulse rate for one full minute.	_____	_____
Pulse rate within four beats per minute of actual pulse rate (instructor's results).	_____	_____
Locates radial pulse site on inside of wrist at base of thumb.	_____	_____
Counts casualty's pulse rate for one full minute.	_____	_____
Pulse rate within four beats per minute of actual pulse rate (instructor's results).	_____	_____

OVERALL EVALUATION	GO	NO GO
(A no-go on any step gives an overall evaluation of NO GO for the entire task.)	_____	_____

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LESSON 19
MEASURE AND MONITOR A CASUALTY'S RESPIRATIONS

TASK

Determine a casualty's respiration rate and describe characteristics of the respirations.

CONDITIONS

Given a simulated casualty.

STANDARD

Score a GO on the performance checklist.

REFERENCES

FM 21-11, First Aid for Soldiers.
STP 8-91-SM, Soldier's Manual: CMF 91: General Medical Tasks.

19-1. INTRODUCTION

Respiration (breathing) supplies the body with oxygen needed by the body and removes carbon dioxide, a waste product. Respiration has two phases: inhalation (bringing fresh air into the lungs) and exhalation (expelling air from the lungs). When the muscles of the rib cage and the diaphragm muscle contract, the chest expands (rib cage pulled up and out, bottom of chest cavity lowers). When the chest expands, air rushes into the lungs. When the chest muscles and diaphragm muscle relax, the chest cavity returns to its normal (smaller) size and some of the air in the lungs is forced out. Usually, an adult will inhale and exhale about 500 milliliters (about one pint) each time he breathes. Not all of the air is exhaled. After normal exhalation, around 2300 milliliters (ml) of air remain.

Breathing is usually performed automatically (without conscious thought) by the respiratory control center located in the brain. Serious head injuries can interfere with the control center and make mouth-to-mouth resuscitation or other measures necessary. Determining the effectiveness of the casualty's efforts to breathe

(rate and depth) and other characteristics can be of great help in evaluating a casualty's condition.

Respiration is also affected by the amount of carbon dioxide in the blood. An increased in carbon dioxide causes in an increase in respiration rate. The respiratory rate is also affected by extremes in body temperature and by emotions such as anger, fear, and anxiety.

19-2. COUNT THE CASUALTY'S RESPIRATIONS

You will normally have the casualty to lie on his back while you observe the rise and fall of his chest for one full minute. One respiration consists of one inhalation (chest rises) and one exhalation (chest falls). If possible, count the casualty's respirations when he is not aware that you are counting (his awareness could cause his breathing rate and depth to change. If you are taking the casualty's pulse, simply continue to act as though you are still taking his pulse while actually observing his chest.

Count the casualty's respirations for one full minute. Count each rise and fall of the casualty's chest as one respiration. Do not count an incomplete cycle.

19-3. LOOK FOR CHARACTERISTICS OF NORMAL AND ABNORMAL RESPIRATION

Characteristics of Normal Respiration

The normal range of respiration rate in an adult when resting is 12 to 20 respirations per minute.

Normal respiration results in deep and even movement in the chest. The depth of respirations refers to the amount of air inhaled and exhaled with each breath. If respirations are shallow, the rib cage does not expand to its normal size. If respirations are deep, the rib cage expands fully.

Normal breathing is effortless, automatic, regular (even) in rhythm, and does not produce noise or discomfort.

The exhalation phase of breathing normally takes longer than the inhalation phase.

Characteristics of Abnormal Respiration

Difficulty in breathing is referred to as dyspnea.

If the casualty's respiration rate is above the normal range, his respirations are called <u>rapid</u>. If his respiration rate is below the normal range, his respirations are called <u>slow</u>.

If the movements (rise and fall) of the chest and abdomen are minimal, insufficient air is being taken in with each inhalation. These respirations are called shallow.

A pattern of shallow and slow respirations is called hypoventilation.

A pattern of sustained rapid, deep respirations is called hyperventilation.

If the respirations are shallow and rapid, the casualty is said to be short of breath.

An irregular breathing rhythm may indicate the presence of injury or illness.

Abnormal breathing is labored and requires effort. Difficult breathing sometimes is accompanied by pain and noises (wheezing, rattling, bubbling, etc.).

A person with difficulty in breathing may lean forward with his arms braced against his knees.

A person with breathing difficulties may be restless or anxious.

A person with breathing difficulties may be pale, ashen (gray), or cyanotic (blue) in the face and lips. The mucous membranes inside the mouth may also be bluish due to the decrease of oxygen in the blood.

The cough is a protective mechanism for removing lung secretions and foreign matter such as dust and blood from the respiratory tract.

19-4. MONITOR THE CASUALTY'S RESPIRATIONS

The characteristics of the casualty's respirations may change as his condition changes (becomes better or worse). Continue to monitor the casualty's respirations. Report abnormalities and changes to medical personnel. Be prepared to administer mouth-to-mouth resuscitation if the casualty stops breathing or his breathing becomes ineffective.

Performance checklist.

Continue with Exercises

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PRACTICE EXERCISES: LESSON 19

INSTRUCTIONS: Answer the following exercises by circling the letter of the response that best answers the question or by writing the missing term in the blank provided. After you have answered all of the exercises, check your answers against the "Practice Exercises Solutions". For each exercise answered incorrectly, reread the lesson material referenced.

1. Should a casualty be aware that you are counting his respirations?

   a. Yes, it will help to keep his breathing steady.

   b. No, awareness could alter the breathing pattern.

   c. It does not matter since breathing is under involuntary control of the brain.

2. One respiration consists of _____ inhalation and _____ exhalation.

3. During a 60-second period, a casualty's chest rose 16 times and fell 15 times. His respiration rate is _____ respirations per minute.

4. The normal respiration rate for an adult at rest is generally considered to be between _____ and _____ respirations per minute.

5. _____ is a pattern of shallow, slow respirations.

6. _____ is a pattern of rapid, deep respirations.

7. _____ is a pattern of rapid, shallow respirations.

8. Practice counting another person's respiration rate and identifying normal and abnormal qualities of respiration. Compare your actions to the performance checklist.

Check Your Answers on Next Page

LESSON 19 PRACTICE EXERCISE SOLUTIONS

1. b (para 19-2)
2. one; one. (para 19-2)
3. 15. (para 19-2)
4. 12; 20. (para 19-3)
5. Hypoventilation. (para 19-3)
6. Hyperventilation. (para 19-3)
7. Shortness of breath. (para 19-3)

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PERFORMANCE CHECKLIST
TAKE A CASUALTY'S RESPIRATION

Situation: You are going to determine a casualty's respiration rate and identify any abnormal characteristics. Use a wristwatch or other clock with a second hand. If possible, have an experienced person available to verify your results.

	GO	NO GO
Has casualty lie down.	_____	_____
Counts casualty's respirations for one full minute.	_____	_____
Respiration rate is within two respirations per minute of actual (inrespiration rate (instructor's results).	_____	_____
Any sign of abnormal respiration correctly identified (labored or difficult breathing, shallow breathing, noises accompanying breathing, etc.).	_____	_____
OVERALL EVALUATION (A no-go on any step gives an overall evaluation of NO-GO for the entire task.)	GO	NO GO

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LESSON 20

APPLY A SAM SPLINT TO A FRACTURED LIMB

TASK

Apply a SAM splint to a fractured limb.

CONDITIONS

Given a simulated casualty with a fractured limb and a SAM splint.

STANDARD

Score a GO on the performance checklist.

REFERENCES

FM 21-11, First Aid for Soldiers.
STP 21-1-SMCT, Soldier's Manual of Common Tasks: Skill Level 1.

20-1. INTRODUCTION

The universal malleable aluminum splint, called the SAM Splint (Splint, Aluminum Malleable) can be used as the rigid objects in splinting a fractured wrist, forearm, upper arm, ankle, or lower leg. It is a piece of flat aluminum completely covered by foam, which serves as padding for the splint. The SAM splint is lightweight (less than 7 ounces) and measures 4.25 inches wide by 36 inches long. The splint is rolled up for easy storing and can be reused.

20-2. PREPARE THE CASUALTY FOR APPLICATION OF THE SPLINT

Expose the injury site. Cut away any bulky clothing that may interfere with application of the splint.

WARNING

If you are in a chemical environment, dress any wounds and splint the fracture without exposing the injury. Do not cut away any clothing.

Check for a pulse below the fracture site. If no pulse is found, splint the injury and evacuate the casualty as soon as possible.

Do not attempt to straighten the fractured limb. If a joint is fractured, splint the limb in that position. Adjust the shape of the SAM splint to conform to the shape of the limb.

FIGURE 20-1. SAM SPLINT ROLLED UP

20-3. APPLY THE SAM SPLINT TO A FRACTURE OF THE FOREARM, WRIST, LOWER LEG, OR ANKLE

a. Fractured Forearm or Wrist

Unroll the SAM splint and flatten it.

Fold the SAM splint in half so it is a tall V-shape.

Bend the edges of the splint in until the shape of the splint generally conforms to the curve and shape of the limb being splinted. (Each half of the splint will have a U-shape.) Bending the edges also increases the rigidity of the SAM splint.

Prepare cravats from muslin bandages to be used in securing the splint.

If muslin bandages are not available, cut or tear strips of cloth from a blanket or clothing.

If materials are not available, use the tape in your aid bag to secure the splint.

Apply the SAM splint to the fractured limb so the fracture is between the two sides of the splint. Adjust the shape of the SAM splint to conform to the limb, if needed.

Secure the splint using at least two cravats. Secure the splint above the fracture site and below the fracture site. Do not apply a cravat directly over the fracture site.

Tie the tails of the cravats in a nonslip knot on the outside of the splint. Tuck the ends of the tails into the cravat to prevent accidental entanglement when the casualty is moved.

Check the casualty's pulse below the most distal cravat.

If you cannot detect a pulse, but the casualty had a pulse before the splint was applied, loosen the cravats and reapply. If the splint is applied to the upper arm, make sure the end of the splint is not pressing into the armpit.

After you have adjusted the splint (if needed) and retied the cravats, check the casualty's pulse again. If the casualty still does not have a pulse, evacuate the casualty as soon as possible.

b. Fractured Lower Leg or Ankle

Quickly shape the splint.

Check the casualty's pulse below the fracture site. Loosen footgear, if needed.

Apply the splint to the casualty's lower leg with the bend on the bottom of the footgear.

Secure the splint with cravats above and below the fracture site, if possible. Tie the tails in a nonslip knot on the outside of the splint.

Check the casualty's pulse below the most distal cravat.

If you cannot detect a pulse, but the casualty had a pulse before the splint was applied, loosen the cravats and reapply. If the splint is applied to the upper arm, make sure the end of the splint is not pressing into the armpit.

After you have adjusted the splint (if needed) and retied the cravats, check the casualty's pulse again. If the casualty still does not have a pulse, evacuate the casualty as soon as possible.

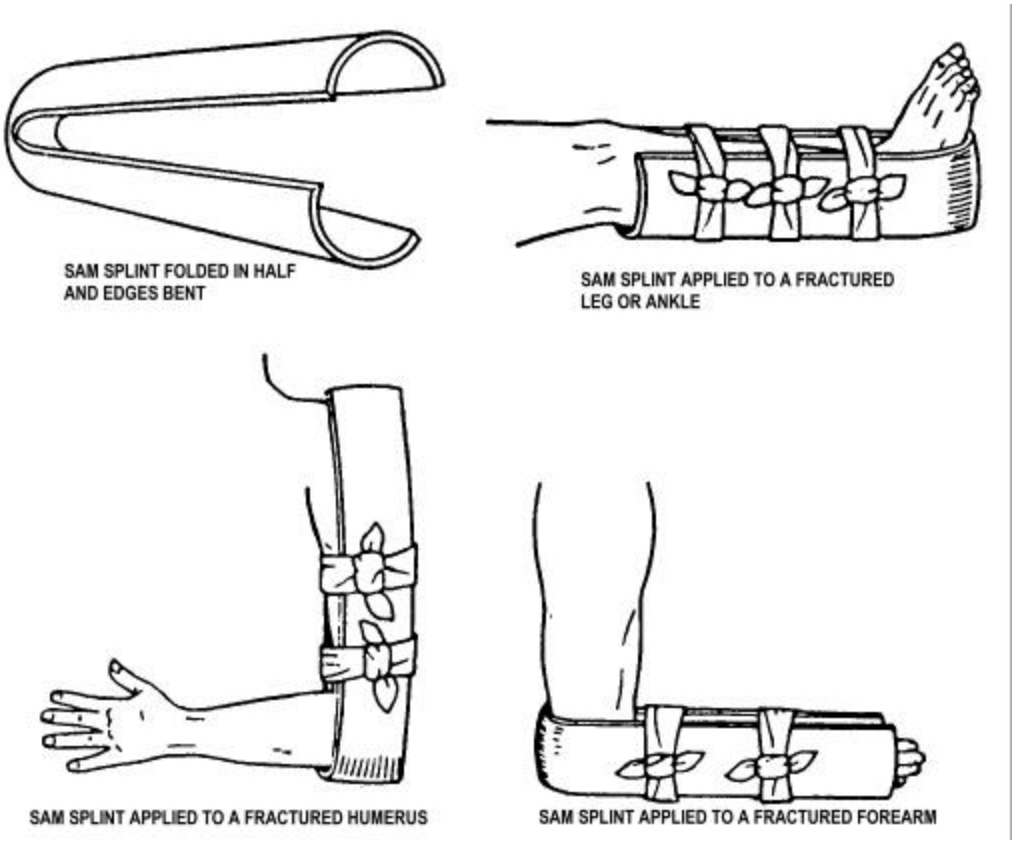

FIGURE 20-2. SAM SPLINT APPLICATIONS

20-4. APPLY THE SAM SPLINT TO A FRACTURE OF THE UPPER ARM (HUMERUS)

Unroll the SAM splint and flatten it.

Fold the SAM splint into an irregular (uneven) V-shape so one side of the V is about four to six inches shorter than the other.

Bend the edges of the splint so the sides of the splint are U-shaped and generally conform to the shape of the limb being splinted.

Prepare securing materials (cravats, strips of cloth, or tape).

Apply the SAM splint to the fractured limb so the short side is in the casualty's armpit (but not pressing on the armpit), the long side extends to the shoulder, and the upper arm is between the two sides of the splint.

Adjust the shape of the SAM splint to conform to the limb, if needed.

Secure the splint using at least two cravats. Secure the splint above the fracture site and below the fracture site. Do not apply a cravat directly over the fracture site.
Tie the tails of the cravats in a nonslip knot on the outside of the splint and tuck in the tails.

Check the casualty's pulse below the most distal cravat.

> If you cannot detect a pulse, but the casualty had a pulse before the splint was applied, loosen the cravats and reapply. If the splint is applied to the upper arm, make sure the end of the splint is not pressing into the armpit.
>
> After you have adjusted the splint (if needed) and retied the cravats, check the casualty's pulse again. If the casualty still does not have a pulse, evacuate the casualty as soon as possible.

20-5. CHECK THE CASUALTY

Check the casualty's pulse below the most distal cravat.

> If you cannot detect a pulse, but the casualty had a pulse before the splint was applied, loosen the cravats and reapply. If the splint is applied to the upper arm, make sure the end of the splint is not pressing into the armpit.
>
> After you have adjusted the splint (if needed) and retied the cravats, check the casualty's pulse again. If the casualty still does not have a pulse, evacuate the casualty as soon as possible.

If the splint was applied to a fractured upper arm, forearm, or wrist, apply a sling and swathe to further immobilize the fracture.

Periodically check the distal pulse to ensure that swelling has not compromised the pulse.

If possible, practice applying a SAM splint to simulated casualty. Apply the SAM splint to a fracture of the wrist, forearm, upper arm, ankel, and lower leg. Checklist follows.

Continue with Exercises
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PRACTICE EXERCISES: LESSON 20

INSTRUCTIONS: Answer the following exercises by circling the letter of the response that best answers the question or best completes the sentence. After you have answered all of the exercises, check your answers against the "Practice Exercises Solutions". For each exercise answered incorrectly, reread the lesson material referenced.

1. Which of the following statements is correct?

   a. Padding must be applied between the SAM splint and the fractured limb.

   b. The SAM splint contains its own padding material.

2. Which of the following fractures would probably require an improvised splint rather than the SAM splint?

   a. Fracture of the forearm.

   b. Fracture of the lower leg.

   c. Fracture of the ankle.

   d. Fracture of the thigh.

3. When preparing the SAM splint for use, you should bend the edges of the splint into a:

   a. U-shape.

   b. T-shape.

   c. W-shape.

4. When splinting a fractured forearm, you should secure the splint:

   a. Above the fracture site.

   b. Below the fracture site.

   c. Above and below the fracture site.

5. You should check for a pulse:

   a. Before you apply the SAM splint.

   b. After you apply the SAM splint.

   c. Before and after you apply the SAM splint.

6. When splinting a fractured limb, you _____ attempt to straighten the limb before applying the SAM splint.

a. Should.

b. Should not.

7. You have applied a SAM splint to a fractured lower leg. You should tie the cravats in a nonslip knot with the knot over the:

a. Top (shin) of the lower leg.

b. Inside SAM splint half (next to the other leg).

c. Bottom (calf) of the lower leg.

d. Outside SAM splint half (farthest from the other leg).

8. When applying a SAM splint to a fracture, you normally bend the splint in half to form a V. In splinting one fracture, however, you bend the splint so one side of the V is shorter than the other side. Which of the following fractures is splinted using the irregular shape?

a. Fracture of the upper arm.

b. Fracture of the forearm.

c. Fracture of the lower leg.

d. Fracture of the ankle.

9. If possible, practice applying a SAM splint to a simulated casualty. Apply the SAM splint to a fracture of the wrist, forearm, upper arm, ankle, and lower leg.

Check Your Answers on Next Page

PRACTICE EXERCISE SOLUTIONS LESS0N 20

1. b (para 20-1)
2. d (paras 20-1, 20-3 and 20-4)
3. a (para 20-3 and 20-4)
4. c (para 20-3)
5. c (para 20-2 and 20-5)
6. b (para 20-3)
7. d (para 20-3 & Fig 20-2)
8. a (para 20-4)

Performance checklist.

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PERFORMANCE CHECKLIST

APPLY A SAM SPLINT TO A FRACTURED LIMB

Situation: You have found a casualty with a fractured (forearm, upper arm, wrist, or lower leg). Use a SAM splint and muslin bandages to immobilize the fracture.

	GO	NO GO
Checks for a pulse below the fracture site.	_____	_____
Forms splint into V-shape with edges bent. (If a fracture of the upper arm, one side is shorter than the other. For other fractures, both sides of the V are about equal in length.)	_____	_____
Shapes SAM splint to generally conform to shape of limb being splinted.	_____	_____
Does not try to straighten fractured limb.	_____	_____
Applies splint to fractured limb so the fracture is between the two sides of the splint.	_____	_____
Applies at least two cravats to hold splint in place (one above the fracture, the other below the fracture) with no cravat applied over fracture site.	_____	_____
Cravats tied using a nonslip knot with knot tied over the outer splint (part of splint that is away from the body).	_____	_____
Checks for a pulse below the cravats.	_____	_____
(Loosens and reties cravats if pulse was present before the splint was applied and absent after splint was applied.)	(_____	_____)

OVERALL EVALUATION (A no-go on any step gives an overall evaluation of NO-GO for the entire task.	GO	NO GO
	_____	_____

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LESSON 21
INSERT AN OROPHARYNGEAL AIRWAY IN AN UNCONSCIOUS CASUALTY

TASK

Identify the procedures for inserting and maintaining an oropharyngeal airway in an unconscious casualty.

CONDITIONS

Given multiple-choice items pertaining to the oropharyngeal airway (J-tube) and its use.

STANDARD

Score 70 or more points on the 100-point written examination.

REFERENCES

STP 8-91B15-SM-TG, MOS 91B Medical Specialist

21-1. INTRODUCTION

One of the basic tasks of the combat lifesaver is to restore and maintain respiration (breathing). When the casualty is unconscious, there is always a danger his tongue will slide to the back of his throat and block his airway. This situation can be prevented by inserting an oropharyngeal airway. The airway is a hollow tube through which air can freely pass in and out. The oropharyngeal airway (also called the oral pharyngeal airway or artificial airway) in the aid bag resembles the letter "J" and is often referred to as the J-tube.

21-2. IDENTIFY WHEN THE OROPHARYNGEAL AIRWAY IS USED

The oropharyngeal airway is only used with an unconscious casualty and only if the casualty is breathing on his own (casualty never stopped breathing or breathing was restored). Be aware of or suspect spinal injury in an unconscious casualty and maintain in-line stability if an oropharyngeal airway is used.

WARNING

Do not insert the oropharyngeal airway if the casualty is conscious or semiconscious since the casualty may still have a gag reflex. If the airway causes the casualty to gag, he may vomit and inhale some of the vomitus. Remove the airway anytime the casualty regains consciousness or begins to gag.

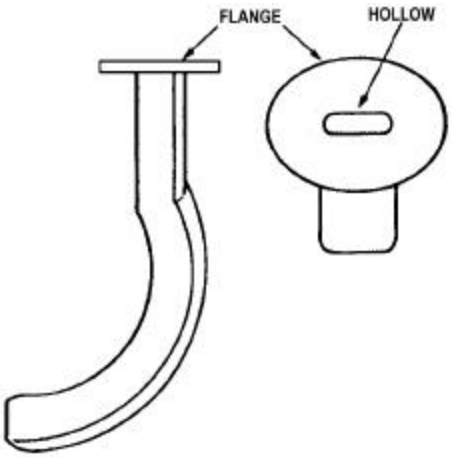

FIGURE 21-1. OROPHARYNGEAL AIRWAY (J-TUBE)

21-3. DETERMINE IF THE OROPHARYNGEAL AIRWAY IS THE APPROPRIATE SIZE

Place the oropharyngeal airway along the outside of the casualty's jaw with one end of the airway at the bottom tip of the casualty's ear. Close the casualty's mouth (jaw in normal position) and bring the other tip of the airway toward the corner of the casualty's mouth. The airway should reach from the bottom tip of his ear to the corner of his mouth. If the airway is too short, it might not be able to hold the casualty's tongue in place. If the airway is too long, it might injure the casualty's throat. Also, the oropharyngeal airway might completely block the casualty's airway if is not the correct size.

Choose the airway that is nearest to the proper size (tip of ear lobe to corner of mouth).

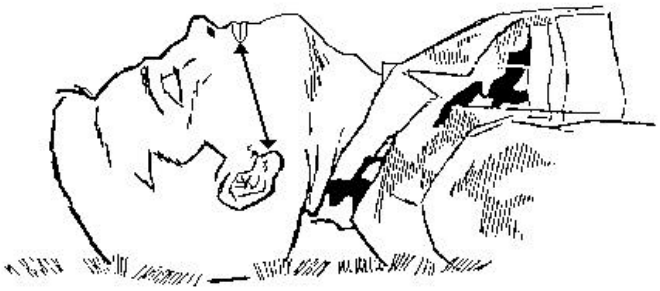

FIG 21-2 PROPER SIZE OF OROPHARYNGEAL AIRWAY

21-4. INSERT THE OROPHARYNGEAL AIRWAY

Position the casualty on his back (may already in this position).

Place your thumb and your index finger of one hand on the casualty's upper and lower teeth near a corner of his mouth so they will cross when the casualty's mouth is opened (crossed-finger method).

Push your thumb and your index finger against the casualty's upper and lower teeth in a scissors-like motion until his mouth opens.

WARNING:

Do not place your fingers inside the casualty's mouth.

Once the casualty's mouth is open, maintain his airway. This is normally accomplished using the head-tilt/chin-lift method. Use the jaw-thrust method if the casualty has a possible fracture of the neck or spine or if the casualty has a severe head injury.

Place the tip end (not the flanged end) of the oropharyngeal airway into the casualty's mouth. Make sure the tube is on top of the tongue.

Position the airway with the tip pointing up toward the roof of the casualty's mouth. This will help to keep the tongue from being pushed toward the back of the throat as the airway is inserted.

Slide the airway along the roof of the casualty's mouth, following the natural curvature of the tongue.

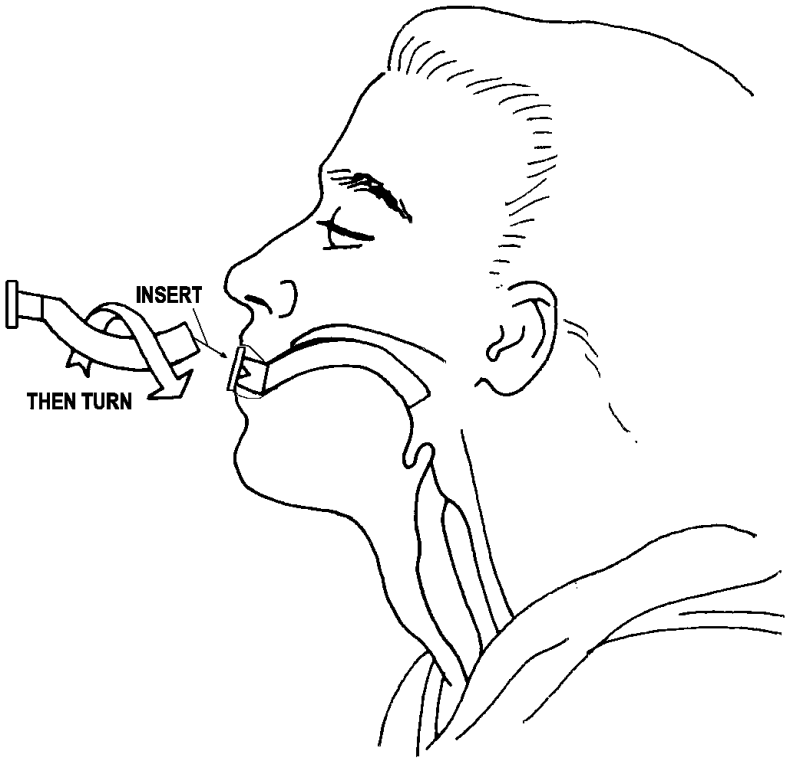

FIGURE 21-3. INSERTING THE OROPHARYNGEAL AIRWAY

When the tip of the airway reaches the back of the tongue (past the soft palate), rotate the airway 180° so the tip end of the airway is pointing down toward his throat. If the airway is difficult to insert or rotate, grasp the casualty's tongue with the fingertips of the hand not holding the airway and gently pull the tongue forward.

Advance the airway until the flange rests against the casualty's lips. The airway should now be positioned so the tongue is held in place and does not slide to the back of the casualty's throat.

21-5. MONITOR A CASUALTY WITH AN OROPHARYNGEAL AIRWAY IN PLACE

Check the casualty's respirations to make sure he is still breathing adequately and the oropharyngeal airway is not blocking his airway. Adjust the position of the oropharyngeal airway, if needed. If the oropharyngeal airway completely blocks the casualty's airway, remove the artificial airway and keep the casualty's airway open using the jaw thrust or the head-tilt/chin-lift.

Remove the oropharyngeal airway if the casualty begins to gag or regain consciousness. If the airway is not removed, the casualty may vomit.

> NOTE: The casualty may push the oropharyngeal airway out of his mouth as he regains consciousness.

Do not tie or tape the airway in place.

> NOTE: A combat medic may tie or tape the oropharyngeal airway in place during evacuation to keep the airway from being dislodged if the casualty can be watched constantly.

Continue with Exercises

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PRACTICE EXERCISES: LESSON 21

INSTRUCTIONS: Answer the following exercises by circling the letter of the response that best answers the question or best completes the sentence. After you have answered all of the exercises, check your answers against the "Practice Exercises Solutions". For each exercise answered incorrectly, reread the lesson material referenced.

1. An oropharyngeal airway can be inserted if the casualty is:

   a. Conscious.

   b. Unconscious.

   c. Either conscious or unconscious.

2. You are inserting an oropharyngeal airway into a casualty's mouth when he starts to gag. What should you do?

   a. Continue to insert the airway at the same speed.

   b. Continue to insert the airway, but at a faster pace.

   c. Continue to insert the airway, but at a slower pace.

   d. Remove the airway.

3. The oropharyngeal airway should be long enough to reach from the:

   a. Bottom tip of the casualty's ear to the tip of his nose.

   b. Outer corner of the casualty's eye to the tip of his nose.

   c. Bottom tip of the casualty's ear to the corner of his closed mouth.

   d. Outer corner of the casualty's eye to the corner of his closed mouth.

4. A soldier says, "If the oropharyngeal airway inserted into the casualty's mouth is the wrong size, it could actually block the casualty's airway." Is this soldier correct?

   a. Yes.

   b. No.

5. A casualty may have a fractured neck. Before inserting the oropharyngeal airway, you should open his mouth and maintain his airway using the:

a. Head-tilt/chin-lift method.

b. Head-tilt/neck-lift method.

c. Jaw-thrust method.

6. Which end of the oropharyngeal airway is inserted into the casualty's mouth?

a. The wide (top of the J) end.

b. The narrow (bottom of the J) end.

7. When the oropharyngeal airway is being inserted into the casualty's mouth, the tip of the airway should point:

a. Up toward the top of the casualty's mouth.

b. Down toward the casualty's tongue.

8. You have inserted an oropharyngeal airway into a casualty's mouth. What should you do now?

a. Tape the airway in place and monitor the casualty.

b. Tie the airway in place with a strip of cloth and monitor the casualty.

c. Leave the airway loose and monitor the casualty.

Check Your Answers on Next Page

LESSON 21 PRACTICE EXERCISE SOLUTIONS

1. b (para 21-2)
2. d (para 21-2 & 21-5)
3. c (para 21-3)
4. a (para 21-3 & 21-5)
5. c (para 21-4)
6. b (para 21-4)
7. a (para 21-4)
8. c (para 21-5)

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LESSON 22
ADMINISTER FIRST AID TO CHEMICAL AGENT CASUALTIES

TASK

Identify signs and symptoms of chemical agent poisonings and their treatments.

CONDITIONS

Given written items pertaining to the identification and treatment of chemical agent casualties.

STANDARD

Score 70 or more points on the 100-point written examination.

REFERENCES

FM 8-285, Treatment of Chemical Agent Casualties and Conventional Military Chemical Injuries.
FM 21-11, First Aid for Soldiers.
STP 8-91B15-SM-TC, MOS 91B, Medical Specialist.

22-1. INTRODUCTION

Chemical agents affect specific body functions and systems. Chemical agents are classified by their effect on the body and by their military use. Toxic chemical agents are used to produce serious injury or death. Chemical agents include nerve agents, blister agents, choking agents, and blood agents. The protective mask and clothing (MOPP gear) provide protection against chemical agents. If you are a combat lifesaver in a conflict in which chemical agents are used, your first action must be to protect yourself (mask, administer Mark I kit if needed, decontaminate exposed skin if needed, and put on protective clothing). You must also be ready to identify and render the appropriate aid to fellow soldiers who may have been exposed to chemical agents as your combat mission allows.

> **NOTE**: Some of the information in para 22-2 and 22-3 summarize information presented in lesson 4, PERFORM FIRST AID FOR A NERVE AGENT INJURY, in Subcourse IS0824. Refer to IS0824 for additional information.

22-2. IDENTIFY SIGNS AND SYMPTOMS OF SEVERE NERVE AGENT POISONING

Nerve agents are usually liquid or gas (vapor). They affect the nerves, muscles, and central nervous system of the body. They are quickly absorbed by the body and their effects can be felt immediately. Nerve agent poisoning can be either mild or severe. A casualty with mild nerve agent poisoning will usually be able to take protective measures (put on mask, decontaminate exposed skin, administer a Mark I nerve agent antidote kit to himself, and put on the rest of his protective clothing). A casualty with severe nerve agent poisoning will not be able to help himself and must receive aid quickly if he is to survive.

Signs and symptoms of mild nerve agent poisoning (unexplained runny nose, sudden headache, dizziness, drooling, tightness in the chest, muscular twitching, stomach cramps,

nausea, and reduced vision) may or may not precede signs and symptoms of severe nerve agent poisoning. Signs and symptoms of severe nerve agent poisoning include:

Strange and confused behavior.

Wheezing, coughing, and gurgling sounds while breathing.

Severely pinpointed pupils.

Red eyes with tears present.

Vomiting.

Severe muscular twitching (spasms).

Loss of bladder and bowel control.

Convulsion.

Unconsciousness.

Respiratory arrest (not breathing).

22-3. TREAT A CASUALTY WITH SEVERE NERVE AGENT POISONING

a. Mask the Casualty

If the casualty is not masked, put his protective mask on him.

WARNING

Squat, do not kneel, when administering aid to a chemical agent casualty. Kneeling on contaminated ground may force the chemical agent into your protective clothing.

b. Administer Three Mark I Kits and CANA

After the casualty is masked and placed on his side (swimmer position), administer the casualty's three Mark I nerve agent antidote kits and one CANA (convulsant antidote for nerve agent) autoinjector. Attach used autoinjectors to his clothing. There is no waiting period between the kits, nor between the third kit and CANA.

c. Decontaminate Face, Mask, and Exposed Skin

The casualty must be decontaminated. If possible, have another soldier decontaminate the casualty's face, mask interior, and exposed skin using the casualty's M291 decontamination kit as the mission permits. This will leave you free to check and treat other casualties.

d. Evacuate the Casualty

Evacuate the casualty to the nearest medical treatment facility (usually a battalion aid station) as soon as possible. If the casualty cannot be evacuated immediately, have the casualty checked by the medic as soon as possible. If you remain with the casualty, continue to monitor the casualty and administer additional atropine and CANA as needed.

e. Administer Additional Atropine, If Needed

You have five atropine autoinjectors in your aid bag. These atropine autoinjectors are used if the three Mark I kits administered to the casualty are not sufficient to control the casualty's symptoms. No additional 2-PAM chloride is administered. A casualty who has received sufficient atropine should have a decrease in the amount of secretions and be breathing more easily. If the casualty is still experiencing a large amount of secretion or difficulty breathing administer more atropine..

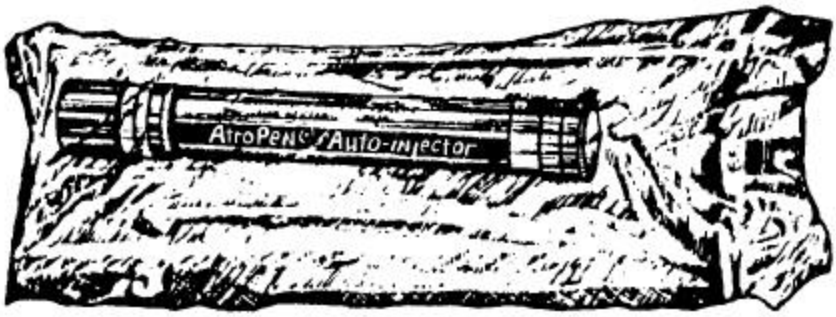

FIGURE 22-1. ATROPINE AUTOINJECTOR

The casualty is on his side in the swimmer position.

Tear the clear plastic protective bag and remove the autoinjector.

Grasp the body of the autoinjector with the thumb and first two fingers of your dominant hand. As you would a pen or pencil.

Grasp the yellow safety cap with your other hand.

Pull the yellow safety cap away from the body of the autoinjector. The autoinjector is now ready to function.

> **CAUTION:** Do not touch the green (needle) end of the autoinjector during the process. Touching the green end could cause the autoinjector to function prematurely.

Holding the autoinjector with the thumb and two fingers place the green (needle) end of the autoinjector against the injection site (same site as used for Mark I autoinjectors) at a 90° angle to the site. Normally, the injection site is on the outer thigh below the hip and above the knee. If the casualty is very thin, the upper, outer quadrant of his buttocks is used as the injection site.

Apply firm, even pressure to the autoinjector until the needle functions (clicks). The needle will penetrate the casualty's clothing and automatically inject the medication into the casualty's muscle.

CAUTION: Do not use a jabbing motion to inject the medication into the muscle.

Hold the autoinjector in place for at least 10 seconds to ensure that all of the medication has been injected; then pull the autoinjector needle out of the muscle at the same 90° angle. Temporarily lay the used autoinjector on the casualty's side.

Attach the used autoinjector to the casualty's outer clothing, usually a pocket flap of his protective outer garment. Push the needle of the autoinjector through the back of the pocket flap and bend the needle to form a hook. (Used autoinjectors inform medical personnel how much medication the casualty has received.)

CAUTION: Take care to avoid puncturing or tearing your protective gloves while securing the autoinjector.

f. Administer Additional CANA, If Needed

Administer a second CANA autoinjector if the casualty is still suffering convulsions 5 to 10 minutes after receiving the first CANA. Attach the used autoinjector to the casualty's clothing.

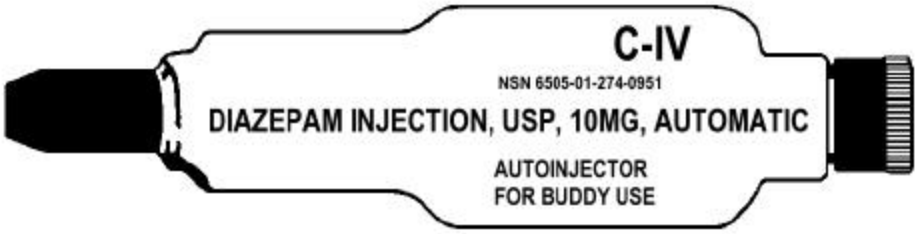

FIGURE 22-2. CANA AUTOINJECTOR

g. Monitor the Casualty

If convulsions are still present 5 to 10 minutes after the second CANA, administer a third CANA. Do not administer more than three CANA auto-injectors.

Attach used autoinjectors to the casualty's clothing.

22-4. IDENTIFY SIGNS AND SYMPTOMS OF EXPOSURE TO BLISTER AGENTS

Blister agents can be delivered either as a liquid or as a gas (vapor). Blister agents include mustard (HD), nitrogen mustard (NH), lewisite (L), and phosgene oxime (CX). Blister agents act primarily on the eyes, respiratory tract, and skin. The effects depend upon the type of agent used, the concentration to which the soldier was exposed, the length of time he was exposed, and the manner (route) the agent entered the body (eyes, skin, and/or respiratory tract). A soldier may be exposed to blister agents for a long time without

realizing his danger. Exposure to high concentrations can cause vomiting and diarrhea. Prolonged exposure to high concentrations can be fatal.

a. Eyes

The eyes are very sensitive and are usually the first to be affected by blister agents. Signs and symptoms include:

Sensitivity to light.

Gritty feeling in eyes.

Inflammation of the inner eyelids.

Swelling and spasms of the eyelids.

Watery eyes.

Pain.

b. Skin

Signs and symptoms of skin exposure to blister agents usually appear 4 to 6 hours after exposure. However, they may not appear for 24 to 48 hours following exposure. Signs and symptoms include the following.

Itching.

Redness (similar to a sunburn).

Swelling and inflammation.

Blisters.

Pain. (If lewisite or phosgene oxide is the agent, pain is immediate and intense.)

c. Respiratory Tract

Signs and symptoms of respiratory tract exposure to blister agents usually appear 4 to 6 hours after exposure. However, they may not appear for 24 to 48 hours following exposure. Signs and symptoms include:

Throat irritation (dry, burning sensation).

Harsh cough and hoarse voice.

Phlegm (mucous discharge) or frothy sputum.

Runny nose and frequent sneezing.

d. Other

Other signs and symptoms that can occur include headache, nausea, vomiting, and diarrhea.

22-5. TREAT A CASUALTY EXPOSED TO A BLISTER AGENT

a. Mask the Casualty

If the casualty is not masked, put his protective mask on him. Remember to squat, not kneel.

b. Irrigate the Casualty's Eyes, If Needed

If the casualty's eyes were exposed to liquid blister agent, you must take quick action to decontaminate his eyes by flushing them with water or other potable (drinkable) fluid using the following procedures. Leaving liquid blister agent in the eye is more dangerous than exposing the casualty's face to blister vapor.

Remove and open the casualty's canteen.

Have the casualty take a deep breath and hold it. The casualty should keep his mouth closed.

Lift the casualty's mask from his chin to expose his eyes.

Tilt the casualty's head to one side with the eye to be flushed lower than the other eye. (This prevents chemicals from the eye being flushed from flowing into the other eye.)

Have the casualty open his lower eye. (If the casualty has to open both eyes in order to keep the lower eye open, let him.)

Pour the water from the canteen gently into the lower eye. Pour from the inner edge of the eye (end closest to the nose) to the outer edge.

Continue to flush the eye with water until the blister agent has been flushed from the eye.

Tilt the casualty's head so the other eye is now lower than the flushed eye.

Flush the second eye in the same manner.

Replace, reseal, and clear the casualty's mask. Tell him to breathe normally.

c. Decontaminate Face, Mask, and Exposed Skin

Have the casualty decontaminate his face, mask, and exposed skin with his M291 decontamination kit if he is able. If he is not able, have another soldier perform the decontamination procedures for him. The key to successful decontamination is immediate action upon finding the contamination.

> **CAUTION:** If blisters have already formed, do not attempt to decontaminate the blistered areas. The blisters are actually burns. A casualty with blisters over a wide area of his body is considered to be seriously burned.

d. Evacuate the Casualty

Evacuate the casualty to the nearest medical treatment facility (usually a battalion aid station) as soon as possible. If the casualty cannot be evacuated immediately, have the casualty checked by the medic as soon as practical.

22-6. IDENTIFY SIGNS AND SYMPTOMS OF EXPOSURE TO CHOKING AGENTS

Choking agents are specifically designed to attack the lungs. They destroy lung tissue and cause the lungs to fill with fluids. This action, sometimes called "dry land drowning", will eventually result in death. Choking agents include phosgene (CG), diphosgene (DP), chlorine (Cl), and chloropicrin (PS). Of these agents, phosgene is the most dangerous and the most likely to be used in a military conflict. Your protective mask gives adequate protection against choking agents.

a. Early Signs and Symptoms of Exposure to Choking Agent

Early signs and symptoms will subside rapidly and allow the casualty to carry on with his combat mission. A soldier with these signs and symptoms should be monitored to see if late (severe) signs and symptoms develop. Early signs and symptoms include:

Tears.

Dry throat.

Choking cough.

Tightness in the chest.

Nausea.

Vomiting.

Headache.

b. Late Signs and Symptoms of Exposure to Choking Agent

Late signs and symptoms usually appear 4 to 24 hours after initial exposure if the casualty was exposed to sufficient concentration of the agent or exposed for a sufficient length of time. Late signs and symptoms include:

Anxiety.

Wheezing.

Rapid, shallow breathing.

Weak but rapid pulse (tachycardia).

Serious attacks of coughing that produce white or yellowish fluid, sometimes frothy and tinted with blood.

Cyanosis (bluish tint to lips and nailbeds).

Shock.

Respiratory failure.

22-7. TREAT A CASUALTY EXPOSED TO CHOKING AGENTS

a. Mask the Casualty

If the casualty is not masked, put his protective mask on him. Remember to squat, not kneel.

b. Treat Asymptomatic Casualty

Sometimes a casualty who has been exposed to choking agents will show no signs or symptoms of exposure. Also, a casualty who previously showed early signs and symptoms of exposure to choking agents may appear to be free of signs and symptoms. If the military situation allows, a casualty who is asymptomatic (no symptoms) should be assigned light duties that will not put stress on his respiratory system. Monitor the casualty for development of signs and symptoms. Have the casualty evaluated by medical personnel as soon as possible.

c. Treat Early Signs and Symptoms

A casualty with early signs and symptoms of exposure to a choking agent should be allowed to sit until the signs and symptoms have subsided if the military situation permits. Have the casualty evaluated by medical personnel as soon as possible.

d. Treat Late Signs and Symptoms

Have the casualty rest in a sitting position and keep him warm. Evacuate the casualty as soon as possible.

22.8. IDENTIFY SIGNS AND SYMPTOMS OF BLOOD AGENT POISONING

Blood agents (cyanides) are quick acting agents that interfere with the cells' ability to absorb oxygen. Inhalation is the usual route of entry. Blood agents include hydrocyanic acid (AC) and cyanogen chloride (CK). Some of the signs and symptoms of blood agent poisoning, such as blood-tinted sputum, may also be present since some blood agents also attack the lungs. Exposure to a high concentration of blood agent can cause death within minutes. Signs and symptoms include:

Dizziness and headache.

Cherry-red skin.

Eye, nose, and throat irritation.

Nausea and vomiting.

Slow pulse (bradycardia).

Fast and deep breathing (hyperventilation), followed by shallow breathing and faintness (hypotension). [Hyperventilation is part of the initial excitatory phase of blood agent poisoning. Hypotension, which follows, is caused by a lack of oxygen and is part of the depressive phase of blood agent poisoning.]

Convulsions.

Respiratory arrest.

Cardiac arrest.

22-9. TREAT A CASUALTY WITH BLOOD AGENT POISONING

a. Mask the Casualty

If the casualty is not masked, put his protective mask on him. Remember to squat, not kneel.

b. Get Medical Help/Evacuate the Casualty

If possible, get medical help (combat medic). If the combat medic is not immediately available, evacuate the casualty to the nearest medical treatment facility as quickly as possible.

Continue with Exercises

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PRACTICE EXERCISES: LESSON 22

INSTRUCTIONS: Answer the exercises by circling the letter of the response that best answers the question or best completes the sentence or by writing the missing term in the blank provided. After you have answered all of the exercises, check your answers against the "Practice Exercises Solutions". For each exercise answered incorrectly, reread the lesson material referenced.

1. You and a fellow soldier are unmasked when your position is attacked using nerve agents. What should be your first action?

   a. Help the soldier put on his protective mask.

   b. Put on your protective mask.

   c. Administer three sets of Mark I kits to the casualty.

   d. Administer five atropine autoinjectors to the casualty.

2. Signs/symptoms of severe nerve agent poisoning are:

   a. Eyes that feel as though sand is present in them, eyelids swollen and twitching, tears present, inner eyelid inflamed.

   b. Coughing, vomiting, severe muscular twitching, urination, pinpointed pupils.

   c. Cherry-red skin, dizziness, slow heartbeat, sore throat, rapid and deep respirations.

   d. Tears, cough, vomiting, and headache. Signs and symptoms appeared quickly and lasted only a short time.

3. You are administering an atropine injection to a casualty. What position should the casualty be in?

   a. on his side

   b. on his stomach

   c. on his back

   d. standing

4. When administering the atropine autoinjection how many seconds should it be held in place?

a. 20.

b. 15.

c. 10

5. Which one of the following is a correct procedure for administering an atropine autoinjector?

a. Administer the injection in the casualty's buttocks unless he is very thin.

b. Remove the yellow cap from the autoinjector before administering the injection.

c. Administer the injection using a jabbing motion.

d. Leave the needle in the casualty's muscle for at least 20 seconds.

e. All of the above are proper procedures.

6. Signs/symptoms of blister agent poisoning are:

a. Eyes that feel as though sand is present in them, eyelids swollen and twitching, tears present, inner eyelid inflamed.

b. Coughing, vomiting, severe muscular twitching, urination, pinpointed pupils.

c. Cherry-red skin, dizziness, slow heartbeat, sore throat, rapid and deep respirations.

d. Tears, cough, vomiting, and headache. Signs and symptoms appeared quickly and lasted only a short time.

7. When flushing a casualty's eyes, you should tilt his head so one eye is lower than the other and pour water into the:

a. Upper eye.

b. Lower eye.

8 You are in full protective gear. Another soldier has just masked, but has liquid blister agent in his eyes. You should:

a. Decontaminate his eyes immediately by flushing them with water.

b. Decontaminate his eyes immediately using his M291 decontamination kit.

c. Wait until you are in a protected area, then decontaminate his eyes by flushing them with water.

d. Wait until you are in a protected area, then decontaminate his eyes using his M291 decontamination kit.

9 Signs/symptoms of choking agent poisoning are:

a. Eyes feel as though sand present in them, eyelids swollen and twitching, tears present, inner eyelid inflamed.

b. Coughing, vomiting, severe muscular twitching, urination, pinpointed pupils.

c. Cherry-red skin, dizziness, slow heartbeat, sore throat, rapid and deep respirations.

d. Tears, cough, vomiting, and headache. Signs and symptoms appeared quickly and lasted only a short time.

10. A soldier is showing late signs and symptoms of choking agent poisoning. What should you do?

a. Administer one injection of atropine and evacuate the casualty.

b. Have the casualty rest in a sitting position, keep him warm, and evacuate him.

c. Have the casualty rest in a sitting position until the signs and symptoms subside.

d. Administer three injections of atropine and evacuate the casualty if signs and symptoms do not subside.

11 Signs/symptoms of blood agent poisoning are:

a. Eyes feel as though sand present in them, eyelids swollen and twitching, tears present, inner eyelid inflamed.

b. Coughing, vomiting, severe muscular twitching, urination, pinpointed pupils.

c. Cherry-red skin, dizziness, slow heartbeat, sore throat, rapid and deep respirations.

d. Tears, cough, vomiting, and headache. Signs and symptoms appeared quickly and lasted only a short time.

12. A soldier is showing signs and symptoms of blood agent poisoning. What should you do after masking the casualty?

a. Evacuate the casualty.

b. Administer one injection of atropine.

c. Administer three injections of atropine and evacuate the casualty if signs and symptoms do not subside.

d. Have the casualty rest in a sitting position and keep him warm until the signs and symptoms subside.

Check Your Answers on Next Page

LESSON 22 PRACTICE EXERCISE SOLUTIONS

1. b (para 22-1)
2. b (para 22-2)
3. a (para 22-3e)
4. c (para 22-3e)
5. b (para 22-3f)
6. a (para 22-4a)
7. b (para 22-5b)
8. a (para 22-5b)
9. d (para 22-6b)
10. b (para 22-7d)
11. c (para 22-8)
12. a (para 22-9b)

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LESSON 23
IDENTIFY A CASUALTY WITH COMBAT STRESS REACTION (BATTLE FATIGUE)

TASK

Identify characteristics of combat stress reaction (CSR) and how to refer to appropriate care.

CONDITIONS

Given written items pertaining to the identification and treatment of combat stress.

STANDARD

Score 70 or more points on the 100-point written examination.

REFERENCES

FM 8-51, Combat Stress Control in a Theater of Operations: Tactics, Techniques, and Procedures.
FM 21-11, First Aid for Soldiers.
FM 22-51, Leader's Manual for Combat Stress Control.

23-1. INTRODUCTION

A soldier can suffer a wound from an enemy bullet, be burned by an explosion, or fracture a leg by jumping from a building. In all of these injuries, physical injury to the casualty can be seen (blood from a wound, burned flesh, abnormal position of a limb, etc.). A casualty with combat stress reaction (CSR), however, does not present such an obvious injury. In World War II, CSR was called battle fatigue. In this subcourse, battle fatigue and CSR will be considered to be the same. Such soldiers are as much a casualty as a soldier who has been wounded by a bullet. Like any other injury, the more rapidly CSR is identified, the better the chances for a quick recovery.

23-2. IDENTIFY THE CAUSES OF COMBAT STRESS

A combat soldier’s routine has always been characterized by stress. This stress may result from physical exhaustion, constant alertness, the trauma of seeing fellow soldiers wounded or killed, the fear of being killed or maimed, the fear of killing other people, worry about family problems back home, fear of failure or disgrace, or a combination of these or other fears. CSR is a psychological reaction to these stresses. Loss of sleep, physical fatigue, and illness can also be contributing factors. CSR is usually temporary and does not require a soldier to be removed from combat conditions. Sometimes, however, the CSR is severe and the soldier cannot function effectively. He may become a threat to his own safety and to the safety of his fellow soldiers.

23-3 IDENTIFY THE SIGNS AND SYMPTOMS OF MILD COMBAT STRESS REACTION

Expect CSR to occur. Mild CSR does not seriously interfere with the soldier's effectiveness. It is the natural result of the heavy mental and emotional work of facing danger under difficult conditions. Almost all combat soldiers will suffer mild CSR now and then. Some of the physical, mental, and emotional signs and symptoms of mild CSR are listed below. Do not confuse CSR with fear, fear is a normal response to danger. The symptoms are like CSR but fear can be positive. Fear can make a soldier more alert and increase concentration.

a. Physical Signs and Symptoms

Tense, jumpy, startled at sudden sounds or movement.

Headache, backache, pain in old wounds.

Fidgeting, fine trembling of the hands, fumbling.

Cold sweat, dry mouth, pale skin.

"Tired" eyes, blurred vision.

Pounding heart, feeling dizzy.

Feeling "out of breath," breathing too rapidly.

Fingers and toes tingle, cramp, and go numb.

Upset stomach, "dry heaves," or actual vomiting.

Diarrhea or constipation.

Frequent urination.

Uncontrollable emptying of bowels and bladder when danger suddenly appears.

Fatigue, feeling drained of energy.

Blank, haunted "1000-yard stare."

b. Mental and Emotional Signs and Symptoms

Anxiety, keyed up, worrying.

Irritability, swearing, complaining, bothered by little things.

Difficulty in paying attention or remembering details.

Difficulty in thinking, speaking, and communicating.

Sleeping difficulties, such as being awakened by bad dreams.

Grieving, tearfulness, crying for a dead or wounded buddy.

Feeling guilty about mistakes made or at things that had to be done.

Anger, resentment, or feeling let down by leaders or fellow soldiers.

Decrease in confidence in self and his unit.

An easier way to recognize CSR is to observe the soldier and ask these questions. If you can answer “NO” to one or more, you should suspect CSR.

Is he being himself?

Can he respond to commands?

Can he protect himself?

Will he engage the enemy?

Is he demonstrating appropriate behavior?

Remember CSR is real. It is not cowardice or insanity. Affected soldiers are not weak they are not failures. They are temporarily disabled.

23-4. DEALING WITH A CASUALTY WITH MILD COMBAT STRESS REACTION

The following techniques can be used to help a soldier suffering from mild CSR. If these techniques do not work, have a medic evaluate the casualty. The techniques can also be used to help prevent combat stress.

Appear to be calm and in control of the situation.

Keep the combat stressed soldier focused on the unit's immediate mission. Get everyone to think of succeeding and to talk about ways the team can handle the current situation.

Expect the soldier to continue his duties. Have him to perform a simple, well-learned task or drill according to the local standing operating procedure (SOP).

Have the soldier use relaxation techniques (take a deep breath and let it out slowly, shrug shoulders to release tension, etc.).

Remind the soldier, and others as needed, that CSR is not a sickness or cowardice. It is a reaction to an abnormal, uncomfortable and dangerous situation.

Encourage the soldier to relax, drink water (not alcohol), take nourishment, bathe, and sleep (four hours or more if possible, "catnaps" if not) as the tactical mission and safety permit.

Allow and encourage the soldier to ventilate his feelings.

Keep the soldier busy when he is not resting.

Report on the casualty to the leader or to the medic/health care provider available.

23-5. IDENTIFY THE SIGNS AND SYMPTOMS OF MODERATE/SEVERE COMBAT STRESS REACTION

A soldier suffering from moderate or severe CSR is ineffective and usually requires evacuation. Since a major difference between moderate and severe CSR is the casualty's reaction to treatment, both conditions are usually combined under the term "more serious" CSR. It can occur at a slow or fast rate, depending on the person and the situation. The following are some of the physical, mental, and emotional signs and symptoms of more serious CSR.

a. Physical Signs and Symptoms

Cannot keep still, constantly moving around.

Shaking of arms or whole body

Cowering in terror.

Flinching or ducking at almost any sudden sound or movement.

Paralysis of a body part (hand, arm, leg, etc.) with no obvious physical explanation.

Sudden blindness or deafness (partial or complete) with no obvious physical explanation.

Total immobility (freezing) under fire.

Total physical exhaustion (just stands or sits).

Staggering or swaying when standing.

Vacant stare.

b. Mental and Emotional Signs and Symptoms

Rapid talking, constantly making suggestions.

Argumentative behavior, starting fights, deliberate recklessness, "vicious" within his own squad or group, uncontrollable anger.

Social withdrawal (silence, sulking, prolonged sadness).

Inattentiveness to self-care and hygiene.

Indifference to danger.

Apathetic (no interest in food or anything else).

Loss of memory (cannot remember orders, how to perform duties, or where he is).

Inability to concentrate or make decisions.

Severe speech problems, including stuttering and inability to talk.

Fear of sleeping, even in a relatively safe area.

Seeing or hearing things which are not there (usually after severe sleep loss).

Rapid emotional swings, crying spells, wishing to be dead, hysteria, frantic activity, strange behavior.

Panic running under fire.

23-6. DEALING WITH A CASUALTY WITH MODERATE/SEVERE COMBAT STRESS REACTION

A soldier suffering from moderate or severe CSR should be evaluated by a medic or other health care provider as soon as possible. Early on, CSR casualties need to talk, ventilate to any medical person. All combat stress patients should be treated with the expectation of their going back to duty. Usually CSR casualties recover completely after resting in a safe area, being able to clean up, and receiving hot, nutritious meals.

A casualty with moderate or severe CSR can be a danger to himself and to other soldiers. The techniques used with a casualty with mild CSR can also be used with a casualty with moderate combat stress. The following procedures are used with a soldier suffering from more serious combat stress.

Calmly try to talk the casualty into cooperating if he is responsive.

If the casualty's actions endanger the mission, himself, or other soldiers, do whatever is necessary to bring him under control.

If the soldier appears to be unreliable, unload his weapon. If he is dangerous, take his weapon away from him.

Physically restrain the casualty if he is a danger to himself or to others.

Have a medic evaluate and evacuate the casualty.

Evacuate the casualty to a medical treatment facility if the casualty's condition does not improve or if the casualty is a clear danger. Restrain the casualty during transportation, if needed.

When a CSR casualty returns to the unit, welcome him back. Be willing to talk about what happened and express your confidence in him.

Continue with Exercises

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PRACTICE EXERCISES: LESSON 23

INSTRUCTIONS: Answer the following exercises by circling the letter of the response that best answers the question or best completes the sentence. After you have answered all of the exercises, check your answers against the "Practice Exercises Solutions". For each exercise answered incorrectly, reread the lesson material referenced.

1. Which of the following can cause combat stress?

   a. Physical exhaustion resulting from heavy fighting.

   b. Fear of being hurt in combat.

   c. Fear of not being able to live up to the expectations of fellow soldiers.

   d. Worry about a family member back home who is ill.

   e. All of the above.

2. Which of the following statements is/are correct?

   a. CSR is a sign of cowardice.

   b. Mild CSR can be considered a natural reaction to uncommon stress.

   c. Moderate to severe CSR casualties seldom recover without months or years of psychiatric care.

   d. All of the above are correct.

3. A soldier appears to be tense and jumps when he hears a popping sound. He is perspiring and complains of having a dry mouth and feeling light-headed and nauseous. This soldier probably has:

   a. Mild CSR.

   b. Moderate to severe CSR.

4. Normally, a soldier with mild CSR:

   a. Should be evacuated.

   b. Does not need to be evacuated.

5. Encouraging a soldier to drink water, eat, and get some sleep is appropriate if the soldier is suffering from:

a. Mild CSR.

b. Moderate to severe CSR.

c. Mild, moderate, or severe CSR.

6. Your squad is getting ready to attack an enemy position. A soldier says he cannot fight because his right leg is completely paralyzed. You quickly check the soldier, but can find no sign of injury. This soldier is showing signs of:

a. Mild CSR.

b. Moderate to severe CSR.

7. A casualty has gone without sleep for the past two or three nights because of nightmares. He has been unusually withdrawn and quiet, but is starting to be very talkative and argumentative. He is holding his rifle and yelling about fellow soldiers actually being enemy soldiers. Which of the following is the best method of handling the situation?

a. Grab a knife and threaten the soldier with it.

b. Begin yelling at the soldier, telling him that he is an enemy soldier.

c. Call the battalion commander and have the commander order the soldier to report to sick call.

d. Act calm and persuade the soldier to put the rifle down.

8. Which of the following statements is most accurate concerning CSR casualties who are evacuated?

a. About 35 percent return to their unit within a week.

b. About 50 percent return to their unit within a week.

c. About 75 percent return to their unit within three days.

d. About 95 percent return to their unit within three days.

Check Your Answers on Next Page

LESSON 23 PRACTICE EXERCISE SOLUTIONS

1. e (para 23-2)
2. b (para 23-3 , 23-4, 23-6)
3. a (para 23-3a)
4. b (para 23-4)
5. c (para 23-4 &23-6)
6. b (para 23-5a)
7. d (para 23-6)
8. c (para 23-6)

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LESSON 24
TRANSPORT A CASUALTY USING A MILITARY VEHICLE

TASK

Identify procedures for moving casualties by litter and loading and unloading casualties using military vehicles.

CONDITIONS

Given multiple-choice items pertaining to evacuation.

STANDARD

Score 70 or more points on the 100-point written examination.

REFERENCES

FM 8-10-6, Medical Evacuation in a Theater of Operations: Tactics, Techniques, and Procedures.
FM 8-35, Evacuation of the Sick and Wounded.

24-1. INTRODUCTION

As a combat lifesaver, you may need to evacuate or assist the combat medic in evacuating casualties. Moving a casualty using one-man and two-man manual carries, making improvised litters, and placing a casualty onto a litter were covered in IS0824. This lesson covers moving a casualty on a litter, loading casualties onto military ground and air vehicles, and unloading casualties. The major objectives are load and to move a casualty without causing additional injury to the casualty or injuy to the CLS or medic.

24-2. DETERMINE THE ORDER IN WHICH CASUALTIES ARE TO BE EVACUATED

The number of casualties may exceed the evacuation capabilities. You may need to decide which casualties are to be moved first if the number of litter teams is limited or if the vehicle cannot transport all of the casualties at the same time. The priority of the casualty's evacuation depends upon wounds and condition. If a combat medic is not present, use the following general rules to determine evacuation priority.

a. First Priority

Casualties with conditions that could affect life, limb or eyesight should be evacuated first. These conditions include serious respiratory problems; severe blood loss; second and third degree burns of the face, neck, or perineum; closed head injuries with decreasing mental status; and wounds resulting in poor or no circulation (pulse) in the extremity.

b. Second Priority

Casualties with chest and abdominal wounds, extensive serious eye injury, fractures, and serious second and third degree burns not involving the face, neck, or perineum should be evacuated next.

c. Third Priority

Casualties with minimal injuries (injuries stabilized with self-aid or buddy-aid) and casualties with injuries so severe that only complicated and prolonged treatment could prolong life-expectancy should be evacuated last. This category is used only when evacuation resources are limited. If you are in doubt as to the severity of the injury, place the casualty in one of the other categories.

After you have established a general priority of evacuation, determine which casualties are to be evacuated first. For example, suppose you can evacuate only two litter casualties at a time and you have four litter casualties (one in the first category, two in the second category, and one in the third category). You should evacuate the casualty in the first category and the more seriously injured casualty in the second category first. Evacuate the two remaining casualties when the vehicle or litter teams return.

24-3. MOVE A CASUALTY USING A FOUR-MAN LITTER SQUAD

When possible, casualties who cannot or should not walk are evacuated using a standard aluminum litter and a four-man litter squad.

a. Preparing the Litter

Open the litter and lock the spreader bars (one at each end of the litter) into place. Use your foot to lock the bars into place to prevent possible injury to your hands.

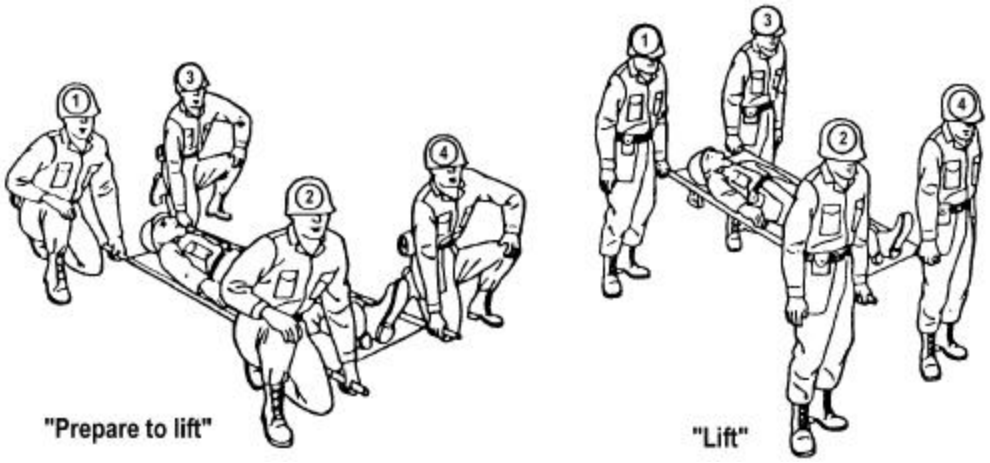

FIGURE 24-1. FOUR-MAN CARRY

b. Preparing the Casualty

Place the casualty on the litter and secure him to the litter with straps designed for this purpose.

c. Preparing the Four-Man Litter Squad

The leader of the litter squad is normally the person with the most medical training. If a combat medic is not available, the combat lifesaver should act as the squad leader. The squad leader normally positions himself at the casualty's right shoulder, which is the best position for monitoring the casualty's condition.

d. Lifting the Litter

The leader must ensure that all of the bearers act in unison. This can be done by using preparatory commands (commands that tell the other bearers the actions to be performed) and commands of execution (commands that tell the other bearers to perform the action). For example, the command to lift a litter is "Prepare to lift, LIFT." On the preparatory command "Prepare to lift," each bearer kneels beside his litter handle and grasps the handle. On the command "LIFT," all bearers rise together. The command to move forward is "Four-man carry, MOVE." The command to lower the litter is "Lower, LITTER."

Lift the litter in a smooth and even manner and keep it as level as possible at all times.

If the terrain is level, use the four-man carry.

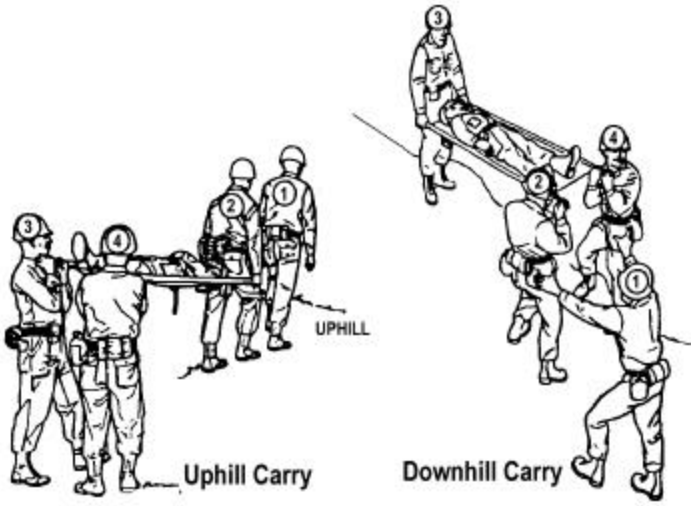

FIGURE 24-2. UPHILL AND DOWNHILL CARRIES

e. Uphill Carry

Use the uphill carry to go up a hill or stairs and the downhill carry to go down a hill or stairs.

f. Downhill Carry

Under normal conditions, the casualty is moved "feet first" (feet toward the direction of travel) when traveling on level ground or when going down a hill or stairs. When going up a hill or stairs, the casualty is moved "head first" (head toward the direction of travel).

CAUTION: If the casualty has a leg fracture and does not have a head injury, reverse the direction of travel. Move the casualty "head first" when traveling on level ground or going downhill and carry the casualty "feet first" when going uphill. This reversed position helps to keep pressure off the leg fracture.

WARNING

Do not reverse the direction of travel if the casualty has a head injury. Doing so would put unnecessary and dangerous pressure on the casualty's head.

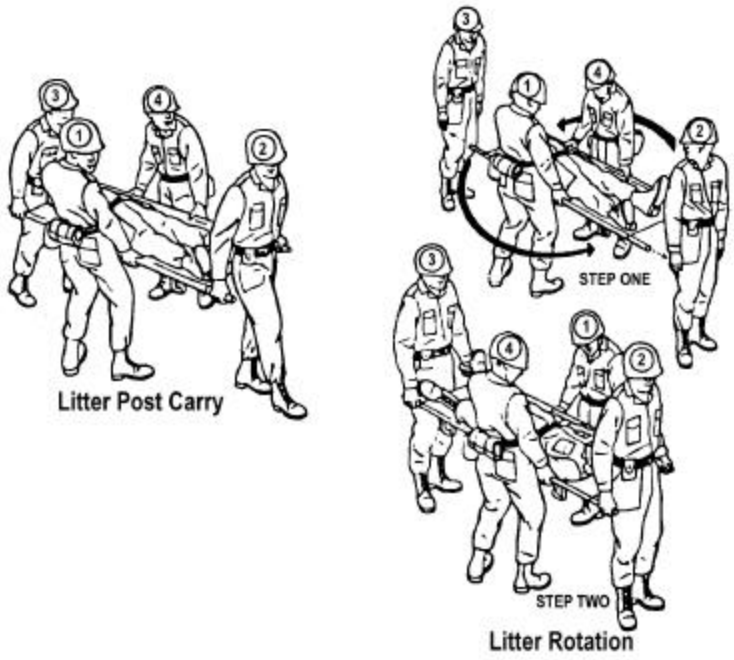

FIGURE 24-3. LITTER POST CARRY AND LITTER ROTATION

g. Litter Post Carry

If the terrain is very rough, use the litter post carry to keep the litter level.

h. Litter Rotation

The litter post carry position is also used to rotate the litter, such as going from a downhill carry to an uphill carry. To change direction of movement, such as from feet first to head first, begin in a litter post carry position. The front and back bearers release the litter and the middle bearers rotate the litter and themselves.

24-4. LOAD CASUALTIES INTO GROUND AMBULANCES

Casualties are usually evacuated by a medical ground vehicle (ground ambulance), by a medical helicopter (air ambulance), or by a nonmedical military vehicle (military vehicle which is not designed to carry litter casualties).

Ambulances have a medical specialist as the driver and another medical specialist to take care of the casualties during evacuation. Follow their instructions for loading, securing, and unloading casualties.

a. General Rules

A litter casualty is usually loaded with his head toward the front of the vehicle unless the medic staying with the casualties wants the casualty loaded feet first so his wound will be more accessible.

When loading casualties into a vehicle, load the most seriously injured casualty last.

Make sure that each litter casualty is secured to his litter. Use litter straps when available.

Make sure that each litter is secured to the vehicle.

Unload casualties in the reverse order in which they are loaded. Unload the most seriously injured casualty first.

b. Load Casualties into an M1010, 1 1/4-Ton, 4x4, Truck Ambulance

FIGURE 24-4. M1010 AMBULANCE (1 1/4 ton)

The M1010 truck ambulance is designed to carry four litter casualties or eight ambulatory casualties or a mixed load of two litter casualties and four ambulatory casualties.

When four litter casualties are transported, they are loaded in the following order:

Upper right berth.

Lower right berth.

Upper left berth.

Lower left berth.

When only two litter casualties are loaded, the sequence is:

Upper right berth.

Lower right berth.
Ambulatory casualties (on left side).

If there is only one litter casualty, load him on either the upper or lower right berth.

c. Load Casualties into an M996, 4x4, Armored Ambulance (HMMWV)

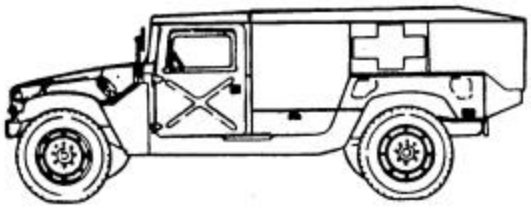

FIGURE 24-5. M996 ARMORED AMBULANCE

The M996 armored ambulance is designed to carry two litter casualties, or six ambulatory casualties, or a mixed load of one litter casualty and three ambulatory casualties.

When two litter casualties are transported, the first casualty is placed in the right berth and the second casualty in the left berth.

d. Load Casualties into an M997, 4x4, Armored Ambulance (HMMWV)

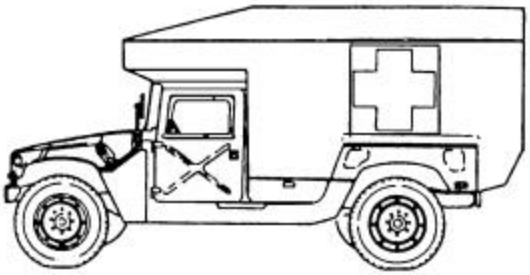

FIGURE 24-6. M997 ARMORED AMBULANCE

The M997 armored ambulance is designed to carry four litter casualties or eight ambulatory casualties or a mixed load of two litter casualties and four ambulatory casualties.

When four litter casualties are transported, they are loaded in the following order:

Upper right berth.

Lower right berth.

Upper left berth.

Lower left berth.

When only two litter casualties are loaded, the sequence is:

Upper right berth.

Lower right berth.

Ambulatory casualties (on left side).

e. Load Casualties into an M113 Full-Tracked Armored Personnel Carrier

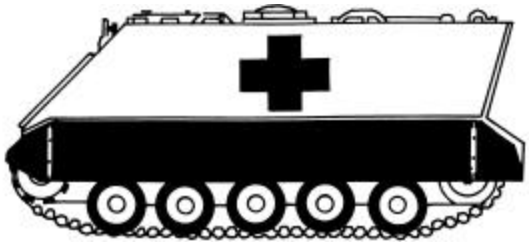

FIGURE 24-7. M113 ARMORED PERSONNEL CARRIER

An M113 armored personnel carrier can be transformed into an ambulance by removing the spall liner and installing the litter suspension kit. (Litter casualties cannot be safely moved if the litter suspension kit is not installed.) The M113 tracked ambulance can carry four litter casualties or ten ambulatory casualties or a mixed load of two litter casualties and five ambulatory casualties.

When four litter casualties are evacuated, they are loaded into berths in the following order:

Upper right berth.

Lower right berth.

Upper left berth.

Lower left berth (most seriously injured casualty).

24-5. LOAD CASUALTIES INTO AIR AMBULANCES

Casualties may be evacuated by helicopter, especially if the distance to be traveled is great and the location hard to reach. Air ambulances have medical specialists to take care of the casualties during evacuation. Follow their instructions for loading, securing, and unloading casualties.

a. General Rules

Remain 50 yards from the helicopter until the litter squad is signaled to approach the aircraft.

Approach the aircraft from the front so the litter squad is in full view of the pilot. Keep a low silhouette when approaching the aircraft.

Approach and leave the aircraft quickly, but do not run.

Avoid the area near the rear rotor of the Blackhawk and Iroquois air ambulance helicopters. If you must go from one side of the helicopter to the other, go around the front of the helicopter.

WARNING

NEVER GO AROUND THE REAR OF THE HELICOPTER AND ALWAYS GO FROM THE DOWNHILL SIDE. TAKE ORDERS FROM THE COMBAT MEDIC OR THE LOADMASTER OF THE AIRCRAFT.

Load the most seriously injured casualty last.

Load the casualty which will occupy the upper berth first; then load the next litter casualty immediately under the first casualty. This is done to keep a casualty from accidentally falling on another casualty should his litter drop before it is secured.

When casualties are placed lengthwise, position them with their heads pointing forward toward the direction of travel.

Make sure each litter casualty is secured to his litter.

Make sure each litter is secured to the aircraft.

Unload casualties in the reverse order in which they are loaded. Unload the most seriously injured casualty first.

b. Load Casualties into a UH-60A Blackhawk Air Ambulance

A Blackhawk is the primary air ambulance used in combat. The normal MEDEVAC (medical evacuation) kit allows the Blackhawk to carry four litter casualties and one ambulatory casualty or seven ambulatory casualties or a mixed load of two litter casualties and four ambulatory casualties.

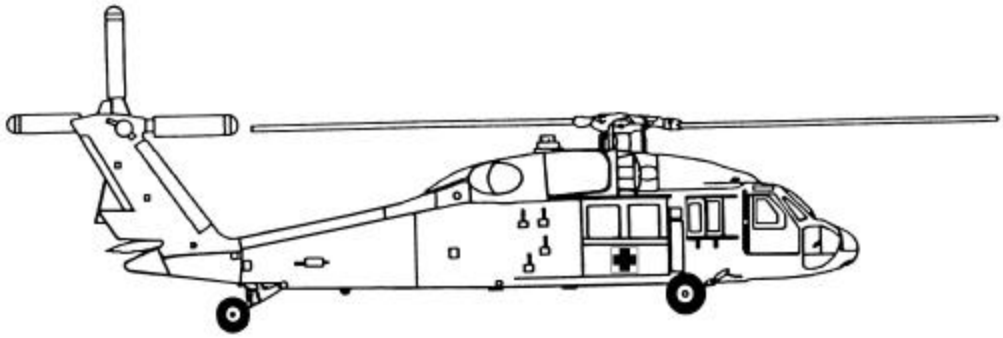

FIGURE 24-8. BLACKHAWK AIR AMBULANCE

Another MEDEVAC kit allows for a configuration of six litter casualties and one ambulatory casualty or seven ambulatory casualties or a mixed load of three litter casualties and four ambulatory casualties. Litter casualties can be loaded on both sides of the helicopter simultaneously.

c. Load Casualties into a UH-1H/V Iroquois Air Ambulance

An Iroquois can evacuate six litter casualties or nine ambulatory casualties or a mixed load of three litter casualties and four ambulatory casualties.

When six litter casualties are evacuated, load the casualties lengthwise with three casualties on each side. The heads of all casualties point forward toward the direction of travel.

FIGURE 24-9. IROQUOIS AIR AMBULANCE

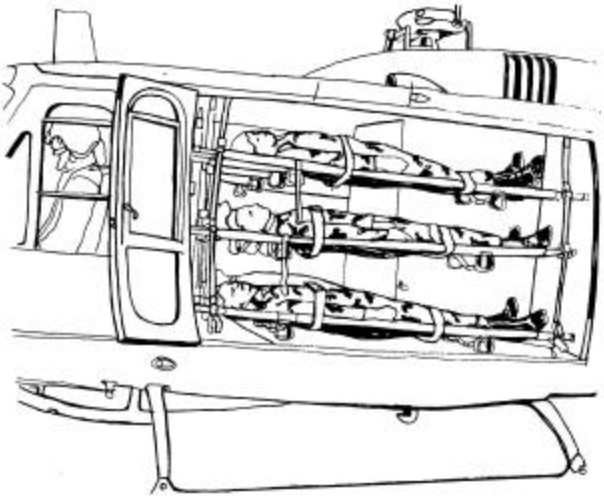

FIGURE 24-10. IROQUOIS AIR AMBULANCE WITH SIX LITTER CASUALTIES

When loading a mixed load, three litters are placed crosswise across the back of the compartment with the ambulatory casualties seated in the aft part of the compartment (two on the right side and two on the left side).

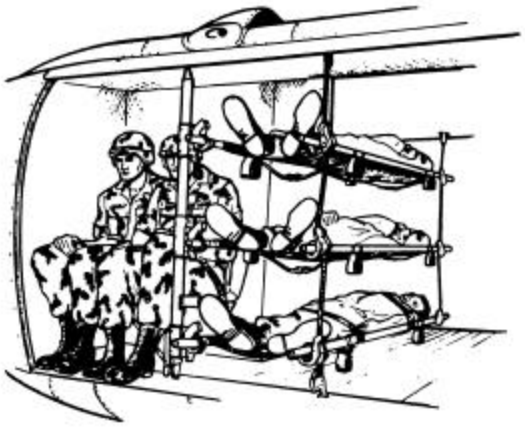

FIGURE 24-11. IROQUOIS AIR AMBULANCE WITH A MIXED LOAD

d. Load Casualties into a CH-47 Chinook Air Ambulance

The CH-47 Chinook air ambulance is a dual rotary-wing aircraft with a capacity of up to 24 litter casualties or 31 ambulatory casualties or several combinations of mixed loads. Litter racks are filled from front to back and from top to bottom. When the configuration is a mixed load, the ambulatory casualties are usually seated in the front of the compartment.

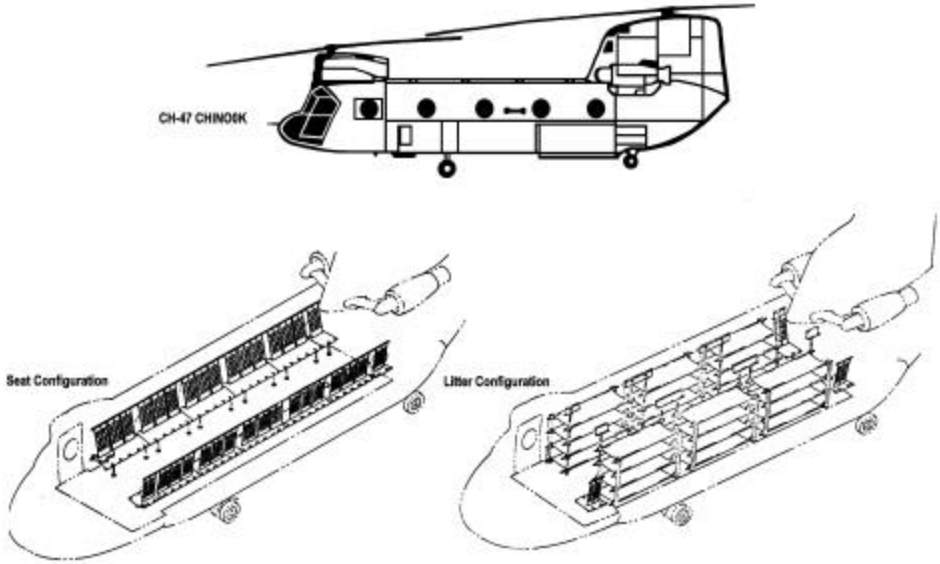

FIGURE 24-12. CHINOOK AIR AMBULANCE WITH LOAD CONFIURATIONS

24-6. LOAD CASUALTIES ON GROUND MILITARY VEHICLES

Nonmedical military vehicles can be used to evacuate casualties when no medical evacuation vehicles are available.

If medical personnel are present, follow their instructions for loading, securing, and unloading casualties.

a. General Rules for Using Tactical Ground Vehicle

When loading casualties into a vehicle, load the most seriously injured casualty last.

When casualties are placed lengthwise, position them with their heads pointing toward the direction of travel.

Make sure each litter casualty is secured to his litter (use litter straps, if available).

Make sure all litters are secured to the vehicle.

Unload casualties in the reverse order in which they are loaded, with the most seriously injured casualty being unloaded first.

b. Load Litter Casualties Onto 1 1/4 Ton , 4x4, M998 (Four-Man Configuration)

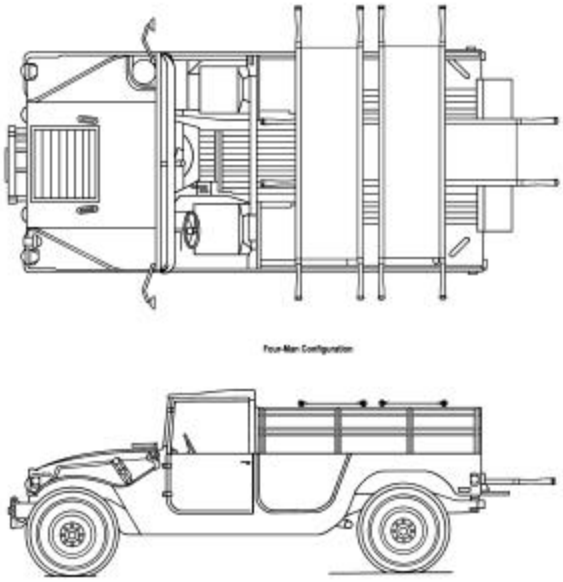

FIGURE 24-13. TRUCK, CARGO/TROOP CARRIER 1 1/4 TON, 4X4, M998 (Four-Man Configuration)

The 1 1/4-ton cargo truck, four-man configuration can be easily adapted to transporting three litters. To convert this vehicle for carrying , follow the procedures listed below.

Remove the cargo cover and metal bows. Secure them in place. Lower the tailgate.

Place two litters side-by-side across the back of the truck with the litter handles resting on the sides of the truck.

NOTE: When the route of evacuation is along narrow roads or trails, care must be taken to prevent the litter handles from catching on trees or bushes.

Secure the litters to the vehicle.

Place one litter lengthwise, head first, in the bed of the truck. Secure it in place.

Leave tailgate open. It is supported by the two tailgate chain hooks.

c. Load Litter Casualties Onto an M880/890 or M1008, 4x4/4x2, 1 1/4-Ton Cargo Truck

Both cargo trucks are light-weight vehicles used to transport personnel or light cargo. They can be adapted to evacuate up to five litter casualties.

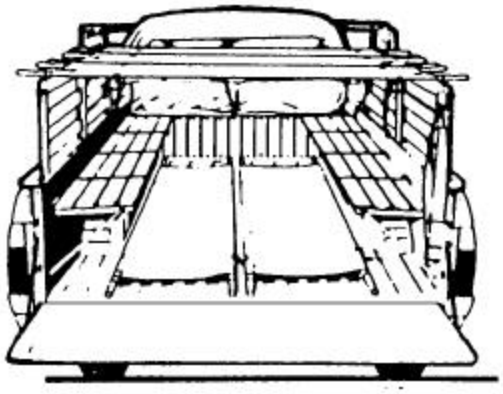

FIGURE 24-14. M880 1 1/4-TON TRUCK (WITH LITTERS)

Prepare the vehicle for evacuating litter casualties in the following manner.

Fold the fabric cover and metal bows forward (toward the truck cab) as an assembly and secure the assembly to the front bow.

Lower the tailgate.

Lower the seats and lock them in place.

Load litter casualties in the following manner. Secure each litter to the vehicle as it is loaded into place.

Load the first litter crosswise across the sideboards close to the truck cab, usually with the casualty's head behind the driver's seat.

Load the second and third litters in a similar manner. Usually, the second casualty loaded with his head behind the passenger's seat and the third casualty loaded with his head behind the driver's seat (loaded alternately head to foot).

Load the fourth litter head first (toward the cab) on the right side of the bed of the truck. The stirrups will keep the litter off the floor.

Load the fifth litter head first on the left side of the bed of the truck. The stirrups will keep the litter off the floor.

Raise and fasten the tailgate to secure the lower litters.

d. Load Litter Casualties Onto a 2 1/2-Ton or 5-Ton, 6x6, Wide Bed Cargo Truck

The 2 1/2-ton truck and the 5-ton cargo truck can be used to transport up to 12 litter casualties each.

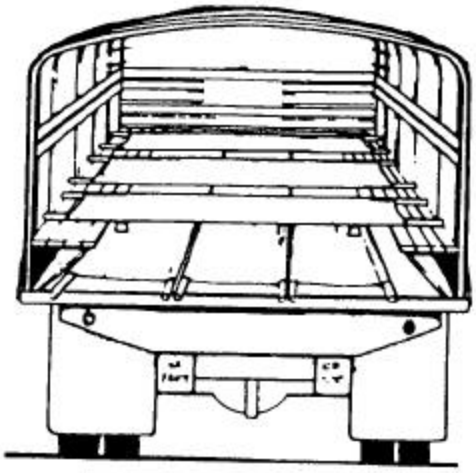

FIGURE 24-15. 2 1/2-TON CARGO TRUCK (WITH LITTERS)

NOTE: The illustration shows only nine litters being transported: three litters on the floor in the front of the truck (hidden in illustration), three litters on the floor in the rear, and three on the seats. ANY VEHICLE CAN BE USED IF THESE ARE NOT AVAILABLE.

Prepare the truck for evacuating litter casualties in the following manner.

Roll the canvas top forward toward the truck cab and secure it to the front bow.

Lower the tailgate.

Lower the seats and lock them in place.

Load litter casualties in the following manner. Secure each litter to the vehicle as it is loaded into place.

Load the first group of three litters crosswise across the seats in the front half (near the cab) of the truck with the litter handles resting on the seats. The casualties are usually placed alternately head to foot (head of first casualty behind driver, head of second casualty behind passenger's side, and head of third casualty behind driver).

Load the second group of three litters lengthwise on the floor in the front half (near the cab) of the truck beneath the first group of litters. Load the casualties head first (head toward the cab). The stirrups will keep the litters off the floor.

Load the third group of three litters crosswise across the seats in the rear half of the truck with the litter handles resting on the seats. Continue to alternate casualties (head of seventh casualty next to feet of third casualty, etc.).

Load the fourth group of three litters lengthwise on the floor in the rear half of the truck beneath the third group of litters. Load the casualties with their heads toward the cab. The stirrups will keep the litters off the floor.

Raise and secure the tailgate as high as possible to help secure the litters in place.

Continue with Exercises

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PRACTICE EXERCISES: LESSON 24

INSTRUCTIONS: Answer the following exercises by circling the letter of the response that best answers the question or best completes the sentence or by writing the required term in the blank provided. After you have answered all of the exercises, check your answers against the "Practice Exercises Solutions". For each exercise answered incorrectly, reread the lesson material referenced.

1. Which litter carry is used to move a litter casualty over rough terrain when the bearers have trouble keeping the litter level?

2. A casualty has a chest wound. You must carry the casualty over level ground to reach a company aid post. You should carry the litter so his _____ is/are forward (in the direction of travel).

   a. Feet.

   b. Head.

3. A casualty has a fractured leg (no head injury). You must carry the casualty uphill to reach a company aid post. You should carry the litter _____ first (in the direction of travel).

   a. Feet.

   b. Head.

4. You are the leader of a four-man litter squad. Where should you position yourself when the four-man carry is being performed?

   a. At the casualty's left foot.

   b. At the casualty's left shoulder.

   c. At the casualty's right foot.

   d. At the casualty's right shoulder.

5. You must carry the casualty uphill to reach a company aid post. The casualty does not have a fractured leg or a head injury. You should carry the litter _____ first (in the direction of travel).

   a. Feet.

   b. Head.

6. You are loading litter casualties into an evacuation vehicle. The most seriously injured casualty should be loaded:

a. First.

b. Last.

7. You are unloading litter casualties from an evacuation vehicle. The most seriously injured casualty should be unloaded:

a. First.

b. Last.

8. You are loading four litter casualties into an M113 evacuation vehicle. In what order should the berths be filled?

First: _____
Second: _____
Third: _____
Fourth: _____

9. You are unloading four litter casualties from an M113 evacuation vehicle. In what order should the berths be unloaded?

First: _____
Second: _____
Third: _____
Fourth: _____

10. When loading a litter into a Blackhawk air ambulance, you should approach:

a. From the front of the helicopter.

b. From the rear of the helicopter.

11. How many litter casualties can a Blackhawk air ambulance carry with the normal MEDEVAC kit?_____

12. What is the maximum number of litter casualties that a Blackhawk air ambulance can carry with the expanded MEDEVAC kit configuration?_____

13. An Iroquois air ambulance can carry ____ ambulatory casualties or ____ litter casualties or a mixed load of ____ litter casualties and ____ ambulatory casualties.

14. When using a nonmedical vehicle to evacuate a litter casualty, make sure:

a. The casualty is secured to the litter.

b. The litter is secured to the vehicle.

c. The casualty is secured to the litter and the litter is secured to the vehicle.

15. An M998, 4x4, 1 1/2-ton cargo/troop carrier truck in the four-man configuration can carry _____ litter casualty(ies).

16. When a litter casualty is loaded lengthwise, his _____ is/are normally pointing in the direction of travel.

a. Feet.

b. Head.

Check Your Answers on Next Page

LESSON 24 PRACTICE EXERCISE SOLUTIONS

1. Litter post carry. (para 24-3)
2. a (para 24-3)
3. a (24-3)
4. d (para 24-3)
5. b (para 24-3)
6. b (para 24-4a, 24-5a, 24-6a)
7. a (para 24-4a, 24-5a, 24-6a)
8. Upper right berth.
   Lower right berth.
   Upper left berth.
   Lower left berth. (para 24-4e)
9. Lower left berth.
   Upper left berth.
   Lower right berth.
   Upper right berth. (para 24-4e)
10. a (para 24-5a)
11. Four (para 24-5b)
12. Six (para 24-5b)
13. nine; six; three, four. (para 24-5c)
14. c (para 24-6a)
15. three litters (para 24-6)
16. b (para 24-6c)

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LESSON 25
EVALUATE THE CASUALTY

TASK

Identify appropriate evaluation and treatment procedures, including sequence, performed on the battlefield.

CONDITIONS

Given multiple-choice examination items pertaining to evaluating and treating a casualty.

STANDARD

Score 70 or more points on the 100-point written examination.

REFERENCES

FM 8-285, Treatment of Chemical Agent Casualties and Conventional Military Chemical Injuries.
FM 21-11, First Aid for Soldiers.
STP 8-91-SM, Soldier's Manual : CMF 91 General Medical Tasks.
STP 21-1-SMCT, Soldier's Manual of Common Tasks: Skill Level 1.

25-1. INTRODUCTION

On the battlefield, you must be able to identify and treat injuries and life-threatening conditions. The sequence in which injuries and conditions are treated can mean the difference between life and death for the casualty.

When treating a casualty, you must identify and treat the most serious condition first. In general, you must make sure the casualty has an open airway and is breathing; then control any major bleeding; and then take measures to control shock. This is referred to as the primary survey of the casualty.

Once life-threatening conditions and/or injuries have been identified and treated, look for other injuries or problems and treat them. This is usually referred to as the secondary survey of the casualty.

If you have more than one casualty, perform a quick primary survey of each casualty. If you find a life-threatening condition during your primary survey, treat that condition immediately. After you have performed primary surveys on all casualties and have treated all immediate life-threatening conditions, perform a secondary survey on each casualty. Treat the more serious casualty first.

Some of the standard evaluation steps may be performed so fast that they appear to be skipped. A casualty who is yelling in pain, for example, is obviously conscious (responsive) and breathing.

This lesson brings together certain buddy-aid tasks presented in IS0824 and certain medical tasks presented in IS0825. The following learning events give the steps normally used in performing a primary and secondary survey in the sequence they are normally performed. The lesson assumes you are in a combat situation, your combat mission allows you to stop and render aid, and no combat medic is immediately available to assist

the casualty.

25-2. PERFORM A GENERAL SURVEY OF THE SCENE

Quickly evaluate your immediate surroundings to gather vital information.

Look for obvious, immediate, life-threatening hazards (fires, explosions, enemy fire, electrical hazards, etc.). You cannot safely evaluate and treat a casualty in a hazardous environment. You must first tactically move the casualty (and yourself) to safety, thus preventing yourself from being injured.

Note the terrain and climate (temperature and weather conditions). This information may alert you to other potential injuries (heat injury in hot climates, immersion foot in marshy terrain, frostbite in cold climate, etc.).

Note the type of battle or incident that occurred. This may help you determine the type of injuries you can expect to treat (bullet wounds after a fire fight, shrapnel injuries after a mortar attack, fractured limbs and spinal injuries after an airborne accident, etc.).

Note whether chemical agents may be present.

25-3. PROTECT CASUALTY FROM HAZARDS

If a life-threatening hazard (such as a fire fight) is present, remove the casualty to a place of safety using the cradle drop drag or other appropriate carry (IS0824, Lesson 15).

If the casualty is being burned (flames, chemicals, electrical current, etc.), eliminate the source of the burn (IS0824, Lesson 11). Take care to prevent being injured yourself, especially if separating the casualty from an electrical wire.

If a spinal injury is suspected (IS0824, Lesson 10), take care to prevent additional damage to the spinal column. Immobilize the casualty's neck and back after completing your primary survey.

25-4. PERFORM A PRIMARY SURVEY OF THE CASUALTY

a. Mask and Treat a Chemical Agent Casualty

If you are in a chemical environment or suspect that chemical agents have been used, protect yourself and then make sure the casualty is properly masked. If severe nerve agent poisoning is present, administer three Mark I kits and one CANA. (IS0824, Lesson 14).

If liquid blister agent is present in the casualty's eyes, flush his eyes with water (IS0825, Lesson 22) even if you are still in a chemical environment.

b. Check the Casualty for Responsiveness

Calmly ask in a loud voice, "Are you okay?" or some similar question that demands a response from the casualty. If he does not respond, gently shake him or tap him on the shoulder and repeat the question.

If the casualty responds, ask the casualty for information ("Where do you hurt?" "Were you hit?" "Were you exposed to chemical agents?" etc.) This information will be useful in your

evaluation, but continue to evaluate the casualty in a systematic method since the injury that hurts the most may not be the injury that needs to be treated first.

If the casualty is not responsive, send a soldier to get a combat medic and continue your evaluation.

c. Check the Casualty's Airway

If the casualty is responsive, evaluate him for airway obstruction (universal choking sign, difficulty in breathing, etc.). If the casualty has poor or no air exchange, apply abdominal and or chest thrusts (IS0824, Lesson 2).

If the casualty is not responsive (unconscious), open his airway using the head-tilt/chin-lift or jaw thrust method (IS0824, Lesson 3).

d. Check the Casualty's Breathing

If a responsive casualty is talking or yelling in pain, his breathing is adequate.

If the casualty is not responsive (unconscious), evaluate his breathing by feeling for breath on your face, looking for the rising and falling of his chest, and listening for sounds of breathing.

If the casualty is not breathing or is having difficulty in breathing, open his airway, clear any airway obstruction, and perform mouth-to-mouth resuscitation (IS0824, Lesson 3).

CAUTION: Do not perform mouth-to-mouth (or -nose) resuscitation in a chemical environment.

e. Check the Casualty's Circulation

If the casualty is responsive and breathing adequately, he has a pulse.

If the casualty is unresponsive or not breathing, check his pulse (IS0825, Lesson 18). If the casualty has no pulse, seek medical help immediately.

f. Check the Casualty for Bleeding

Look for blood-soaked clothing, spurts of blood, pooling of blood under the body and other signs of external bleeding.

If a major amputation of a limb (amputation of the upper arm, forearm, thigh, lower leg, complete hand, or complete foot) is found, apply a tourniquet to the upper arm or thigh and dress the stump (IS0824, Lesson 4). (Amputation of a part of the hand or foot is controlled by pressure dressings.)

If serious bleeding from a wound of the arm or leg is found, apply a field dressing or improvised dressing and bandage to the wound (IS0824, Lesson 4). If the injury has been caused by a missile (bullet, shrapnel), look for both entry and exit wounds. Apply manual pressure and, if the limb is not fractured, elevate the wound.

If serious bleeding from a limb is not controlled by the field dressing, apply a pressure dressing (IS0824, Lesson 4).

If serious bleeding from a limb is not controlled by the pressure dressing, apply a tourniquet (IS0824, Lesson 4).

If an open chest wound is found, seal the wound with the plastic dressing wrapper or other airtight material, tape the sealing material on three sides to form a flutter valve, and apply a field dressing to the wound (IS0824, Lesson 5).

If an open abdominal wound is found, position the casualty in a flexed-knee position, position any protruding organs on the casualty's abdomen, apply a field or improvised dressing over the wound and organs, and secure the dressing (IS0824, Lesson 6).

If an open head wound is found, dress the wound (IS0824, Lesson 7). If the casualty has a severe head injury, immobilize the casualty's head and neck (IS0824, Lesson 10).

CAUTION: If the casualty has more than one severe wound, treat the wound loosing the most blood first.

CAUTION: Do not further expose the wound(s) if you are in a chemical environment.

g. Treat for Chemical Agent Poisoning, If Appropriate

If the casualty has signs and symptoms of chemical agent poisoning (IS0825, Lesson 22), he is breathing, and all life-threatening wounds have been treated, administer treatment for chemical agent poisoning. (NOTE: The casualty has already been masked. If severe nerve agent poisoning was present, three Mark I antidote kits and one CANA were administered.)

Have the casualty begin self-aid decontamination procedures if he is able (IS0824, Lesson 14). If he cannot, have another soldier decontaminate the casualty. Do not stop your evaluation and treatment at this time to decontaminate the casualty.

If the casualty is suffering from severe nerve agent poisoning and 5 minutes have passed since you administered the last Mark I kit and the CANA, take the casualty's pulse. If the pulse rate is below 90 beats per minute, administer an atropine injector.

If the casualty still twitches, showing signs of seizure, you may administer up to two additional CANA injections at about 5 to 10 minute intervals. Actually, time is less important here than the symptoms. Three CANAs are the limit--normally one from the soldier and two from your combat lifesaver aid bag.

h. Check the Casualty for Shock

Check the casualty for signs and symptoms of shock (clammy and pale skin, severe loss of blood, severe burns, increased breathing rate, mental confusion, etc.).

If hypovolemic shock is present, position the casualty, protect him from the environment, and administer fluids intravenously (IS0824, Lesson 8, and IS0825, Lesson 16).

If the casualty has a fractured leg, do not elevate the leg until it is splinted.

Initiate an I.V. if the casualty has suffered severe blood loss or has second or third degree burns on 20 percent or more of his body.

25-5. PERFORM A SECONDARY SURVEY OF THE CASUALTY

a. Check the Casualty for Fractures

Check legs and arms for protruding bone, abnormal limb position, major wounds, bruises, and painful or tender spots.

If a fracture or a massive wound is present, dress any open wounds (including burns) and immobilize the limb with a padded splint (IS0824, Lesson 9, and IS0825, Lesson 19). Secure the splint above and below the fracture site.

CAUTION: Do not try to straighten (align) the broken bone before applying the splint.

CAUTION: Check the casualty's circulation below the fracture before and after applying the cravats. Loosen the cravats and reapply if needed.

Apply a sling and swathe to further immobilize a fractured upper arm, forearm, or wrist (IS0824, Lesson 9).

If a spinal injury is suspected, immobilize the casualty's neck and back (IS0824, Lesson 10).

b. Check the Casualty for Burns

Look for reddened, blistered, or charred skin, for burned or singed clothing, and for other evidence of burns. Pay special attention to burns about the head and neck for possible inhalation burns. Some burns, such as chemical burns, may not be readily seen unless the casualty's clothing is removed.

Do not further expose wounds if you are in a chemical environment.

Apply a dry dressing to burned areas on the trunk and limbs (IS0824, Lesson 11).

Remove jewelry from a burned limb.

Do not apply a bandage to burns of the face or genitalia.

If an electrical current passed through the casualty, locate and dress both the entry and exit wounds.

If the casualty has a chemical burn, remove as much of the chemical as possible before applying a dressing. NOTE: Keep white phosphorus burns wet to keep the particles away from oxygen and thus igniting, but do not try to remove the particles.

If second and third degree burns cover 20 percent or more of the skin surface, initiate an intravenous infusion (IS0825, Lesson 17).

c. Check the Casualty for Closed Head Injury (Concussion)

Look for unequal pupils, fluid leaking from the ear or nose, slurred speech, mental confusion, drowsiness, headache, dizziness, loss of memory, loss of consciousness, twitching or convulsions, difficulty in walking (staggering), and nausea or vomiting (IS0824, Lesson 7).

If a closed head injury is suspected, evacuate the casualty to a medical treatment facility.

If the casualty is having convulsions, support his head and neck and maintain an open airway.

Monitor the casualty's respirations and be prepared to administer mouth-to-mouth resuscitation should it be needed.

d. Check the Casualty for Environmental Injuries

If the casualty has been working in a hot environment, check for signs and symptoms of heat stroke, heat exhaustion, and heat cramps (IS0824, Lesson 12).

If the casualty has heat stroke, expose his skin, pour or spray water on him, fan him, and evacuate him as quickly as possible. Continue cooling efforts, such as pouring or spraying water over the casualty and fanning him, during evacuation. Have him drink cool water if he can tolerate it without vomiting.

If the casualty is suffering from heat cramps or heat exhaustion, move him to a shaded place and cool him off. Have the casualty drink at least one quart of cool water.

All casualties with heat exhaustion or heat stroke should get an intravenous infusion (IS0825, Lesson 17).

If the casualty has been exposed to cold or freezing weather, check for signs and symptoms of general hypothermia, frostbite, immersion syndrome, and chilblain (IS0824, Lesson 13).

If general hypothermia is present, move the casualty to a protected location and use a heat source (such as another soldier's body) to rewarm the casualty. Evacuate the casualty as soon as practical.

If deep frostbite is found, move the casualty to a warm place, thaw the area, and evacuate the casualty as soon as practical. NOTE: Do not thaw frozen feet if the casualty will be required to walk.)

If superficial frostbite or chilblain is found, rewarm and protect the affected area.

If immersion syndrome is found, dry and rewarm the affected area.

Check the casualty for visual problems resulting from lasers weapons or snow blindness (IS0824, Lesson 11, and IS0824, Lesson 13).

Protect the casualty from additional injury. Cover the eyes with a dark cloth if the casualty is in pain or if vision loss is severe.

Evacuate the casualty if practical.

e. Check the Casualty for Other Wounds/Fractures

Look for minor wounds and fractures. Dress and bandage the wounds as time permits. Bleeding from severed fingers and toes can be controlled without the use of a tourniquet. Splint fractured fingers using the same basic splinting procedures given in IS0824, Lesson 9.

f. Check the Casualty for Combat Stress Reaction

If the casualty appears to be injured but you cannot find any physical injury, look for symptoms of combat stress reaction (IS0825, Lesson 23). If combat stress reaction is suspected, take appropriate measures.

25-6. MONITOR THE CASUALTY

Monitor the casualty throughout the evaluation process for the presence of life-threatening conditions. For example, a casualty who is breathing when you begin your evaluation may suddenly stop breathing. Anytime a life-threatening condition is detected, stop your evaluation and treat the life-threatening condition.

Some conditions may require time to properly evaluate. If you put a field dressing on a bleeding wound on the casualty's leg, for example, continue to monitor the injury in case additional measures (pressure dressing or tourniquet) are needed to control bleeding. You can proceed with your evaluation of the casualty while continuing to monitor the wound for bleeding.

If you have administered nerve agent antidote to a severe nerve agent casualty, continue to check the casualty's pulse every five minutes. If the casualty's pulse rate is below 90 beats per minute, administer an atropine autoinjector. Give CANA (up to a total of three doses) for control of seizures (IS0825, Lesson 22).

If the casualty has not been treated for shock, take measures to prevent shock. The measures used to control shock given in Lesson 8 of IS0824 (such as loosening clothing, positioning the casualty, and protecting the casualty from the cold) are also used to prevent shock from occurring.

Monitor a heat cramp or heat exhaustion casualty to ensure that he continues to drink water without vomiting and that his condition does not become more serious. Be prepared to administer mouth-to-mouth resuscitation, increase cooling efforts, initiate an I.V., and evacuate the casualty if his condition worsens.

Be ready to open his airway and administer mouth-to-mouth resuscitation should the need arise. If medical personnel arrive, report your findings.

Insert an oropharyngeal airway in an unconscious casualty to keep his airway open, if needed (IS0825, Lesson 21).

Continue to perform any needed procedures, such as keeping white phosphorus burns wet.

If you are treating more than one casualty, continue to monitor the other casualties for life-threatening conditions while administering treatment to a casualty.

Whenever possible, have the casualty evaluated by a combat medic or other medical personnel.

Continue to monitor the casualty until you return the casualty to duty, until a medical person (usually a combat medic or member of a medical evacuation team) takes over, or until you must resume your combat duties.

If the casualty requires evacuation, transport him using the most effective means available

(IS0825, Lesson 25, and IS0824, Lessons 15).

If you are the leader of a litter team evacuating the casualty, continue to monitor the casualty during the evacuation. Stop and render your aid if a life-threatening condition arises.

If a medic is not available and a soldier has a minor headache, cold, or hay fever, administer acetaminophen or pseudoephedrine hydrochloride tablets as needed if no contraindications are present (IS0825, Lesson 24).

25-7. ASSIST THE MEDIC

If the medic requests assistance and your combat duties allow, assist the combat medic in providing care to casualties and in evacuating casualties. The medic will provide instructions as needed.

Continue with Exercises

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PRACTICE EXERCISES: LESSON 25

INSTRUCTIONS: Answer the following exercises by circling the letter of the response that best answers the question or best completes the sentence or by writing the required term in the blank provided. After you have answered all of the exercises, check your answers against the "Practice Exercises Solutions". For each exercise answered incorrectly, reread the lesson material referenced.

1. A wounded soldier is lying in an open area and is in danger of being hit by enemy rifle fire. You should remove the casualty to a place of safety:

   a. Before performing the primary survey.

   b. After performing the primary survey, but before performing the secondary survey.

   c. After performing the secondary survey.

2. Which of the following statements is true?

   a. In a chemical environment, you should perform mouth-to-nose resuscitation rather than mouth-to-mouth resuscitation.

   b. If serious bleeding from a limb is not controlled by a field dressing, apply a tourniquet immediately.

   c. If a casualty has been exposed to nerve agent and cannot decontaminate himself, do not begin decontamination procedures until you have completed your secondary survey.

   d. If the casualty is in shock, elevate his legs even if one leg is fractured and has not been splinted.

   e. All of the above procedures are correct.

3. Your area has been attacked with nerve agents. You see a fellow soldier in full MOPP (chemical agent protection) gear lying on his back. What should be your first action when evaluating the soldier?

   a. Check for bleeding.

   b. Administer nerve agent antidote.

   c. Ask the soldier if he is injured.

   d. Remove his mask and check his pulse.

4. In general, primary survey procedures involve stopping severe bleeding, restoring breathing, and controlling shock. In which order should these actions be performed?

First: _____

Second: _____

Third: _____

5. Which of the following would be treated first?

a. A closed head injury.

b. A fractured leg.

c. An open head wound with brain tissue visible.

d. An amputation of the forearm.

6. List three situations in which you would start an I.V.

_____

_____

_____

7. A soldier tells you that he was knocked out by an explosion, but says he is fine now. However, the soldier staggers when he walks and has slurred speech. When you ask him to tell you what month it is, he simply has a blank stare. The soldier is probably suffering from:

a. A concussion.

b. Heat exhaustion.

c. A bruised spinal cord.

d. An open chest wound.

8. You have found an unconscious soldier and have determined that he is breathing. Which of the following is true?

a. You do not need to check his breathing again.

b. You should monitor his breathing as long as he is unconscious in case he should require mouth-to-mouth resuscitation.

Check Your Answers on Next Page

LESSON 25 PRACTICE EXERCISE SOLUTIONS

1. a (paras 25-2, 25-3)

2. c (para 25-4g)

3. c (para 25-4b)

4. First: Restore breathing.
   Second: Stop severe bleeding,
   Third: Control shock.
   (paras 25-1, 25-4)

5. d (paras 25-4)

6. Casualty has lost a good deal of blood.

   Casualty has second and third degree burns on 20 percent or more of his body surface.

   Casualty has severe heat injury and cannot drink water. (paras 25-4, 25-5)

7. a (para 25-5c)

8. b (para 25-6)

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