

PREFACE

The Army Institute for Professional Development (AIPD) administers the consolidated Army Correspondence Course Program (ACCP), which provides high-quality, economical training to its users. The AIPD is accredited by the Accrediting Commission of the Distance Education and Training Council (DETC), the nationally recognized accrediting agency for correspondence institutions.

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The AIPD is also a charter member of the Interservice Correspondence Exchange (ICE). The ICE brings together representatives from the Army, Navy, Air Force, Marine Corps, and Coast Guard to meet and share ideas on improving distance education.

IMAGE: Figure Prf1.

IMAGE: Figure Prf2.

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INFANTRY FIELD HYGIENE

Subcourse Number IN 0487

United States Army Infantry School
Fort Benning, Georgia 31905-5593

5 Credit Hours

Edition Date: May 1995

SUBCOURSE OVERVIEW

This subcourse is designed to teach you the procedures for practicing good hygiene in the field. Contained within this subcourse is instruction on preventive medicine, health maintenance, individual and leadership preventive medicine countermeasures, and plan for the construction and maintenance of field sanitation devices.

There are no prerequisites for this subcourse.

This subcourse reflects the doctrine which was current at the time it was prepared. In your own work situation, always refer to the latest publications.

Unless otherwise stated, the masculine genders of singular pronouns is used to refer to both men and women.

Terminal Learning Objective

- ACTION: Practice preventive medicine, health maintenance, individual leadership preventive medicine countermeasures, and plan for the construction and maintenance of field sanitation devices.
- CONDITION: Given the subcourse material contained in this subcourse.
- STANDARD: To demonstrate competency of this subcourse, you must achieve a minimum of 70 percent on the subcourse examination.

TABLE OF CONTENTS

"Section"	"Page"
Subcourse Overview	i
Administrative Instructions.	iii
Grading and Certification Instructions	iii
Lesson 1: Preventive Medicine and Health Maintenance.	1
Part A: Preventive Medicine	2
Part B: Health Maintenance	5
Practice Exercise	10
Answer Key and Feedback	12
Lesson 2: Individual and Leadership Preventive Medicine Countermeasures	15
Part A: Individual Preventive Medicine Countermeasures	16
Part B: Leadership Preventive Medicine Countermeasures	37
Practice Exercise	49
Answer Key and Feedback	52
Lesson 3: Unit Field Sanitation Team Countermeasures	55
Practice Exercise	71
Answer Key and Feedback	74
Examination	77
Student Inquiry	

ADMINISTRATIVE INSTRUCTIONS

1. Number of lessons in this subcourse: Three.
2. Materials needed in addition to this booklet are a number 2 lead pencil, an ACCP Examination Response Sheet, and a preaddressed envelope.
3. Supervisory requirements: None.

GRADING AND CERTIFICATION INSTRUCTIONS

Examination: This subcourse contains a multiple-choice examination covering the material in the three lessons. After studying the lessons and working through the practice exercises, complete the examination. Mark your answers in the subcourse booklet; then transfer them to the ACCP examination response sheet. Completely black out the lettered oval which corresponds to your selection (A, B, C, or D). Use a number 2 lead pencil to mark your responses. When you complete the ACCP examination responsesheet, mail it in the preaddressed envelope you received with this subcourse. You will receive an examination score in the mail. You will receive five credit hours for successful completion of this examination.

ADMINISTRATIVE INSTRUCTIONS

1. Number of lessons in this subcourse: Three.
2. Materials needed in addition to this booklet are a No. 2 lead pencil, an ACCP Examination Response Sheet, and a preaddressed envelope.
3. Supervisory requirements: None.

GRADING AND CERTIFICATION INSTRUCTIONS

Examination: This subcourse has a multiple-choice test covering the material contained in the three lessons. After studying the lessons and working through the Practice Exercises, complete the examination. Mark your answers in the subcourse booklet; then, transfer them to the ACCP Examination Response Sheet, completely blacking out the lettered oval which corresponds to your selection (A, B, C, or D). Use a No. 2 lead pencil to mark your responses. When you have completed the Examination Response Sheet, mail it in the preaddressed envelope provided. Your examination score will be returned to you. A score of 75 or above is passing. Five credit hours will be awarded for successful completion of this examination.

LESSON 1

PREVENTIVE MEDICINE AND HEALTH MAINTENANCE

OVERVIEW

LESSON DESCRIPTION:

In this lesson you will learn to use preventive medicine and health maintenance.

TERMINAL LESSON OBJECTIVE:

TASKS: Use preventive medicine and health maintenance.

CONDITIONS: Given the subcourse material and a training scenario, the student will complete the practice exercise to use preventive medicine and health maintenance.

STANDARDS: The student will demonstrate his knowledge of the task by caring for the feet, purifying water, human solid waste disposal, heat and cold injuries, personal hygiene, diarrhea and dysentery, and dental hygiene.

REFERENCES: The material contained in this lesson was derived from the following publications:

FM 21-11.

INTRODUCTION

Throughout history, the outcome of battles has often been influenced more by the health of the soldiers than the strategy or tactics of the generals. Good health is primarily a personal responsibility. By using correct cleanliness habits, regular exercise, and good nutrition, you can have much control over your health and well being. Good health does not just happen; it comes with a conscious effort and good habits.

PART A - PREVENTIVE MEDICINE

1. Care of Your Feet.

By definition, the infantry is the branch of an army made up of units trained to fight on foot. Therefore, the care and protection of your feet should be one of your primary concerns.

Care of your feet should begin before you start to march. You must ensure that your footgear is the proper type, correctly fitted, and broken in. You should never attempt to break in a new pair of shoes or boots on a march. You must be sure your socks are clean and free of holes or knotty darns which might irritate your foot and cause a blister. You should always carry extra pairs of socks and foot powder with you on a march.

If you have pressure spots or infections on your feet, you should treat them before a march starts. If you develop a blister, there are four steps to treat and protect the affected area.

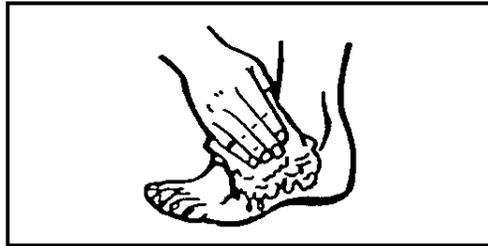


Figure 1-1. Wash the Area.

STEP 1: You wash the blister and surrounding area with soap and water (Figure 1-1).

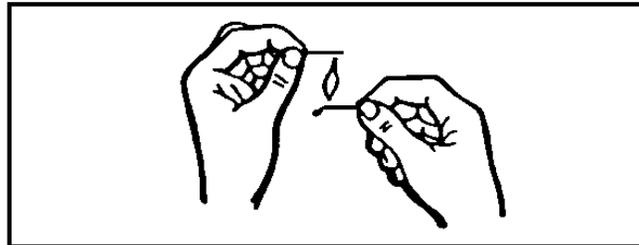


Figure 1-2. Sterilize the Needle.

STEP 2: You sterilize a needle by heating it in a flame until it turns red (Figure 1-2).

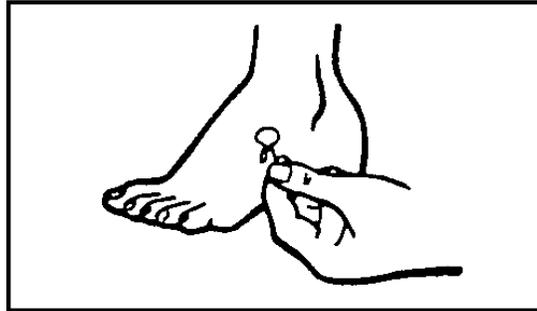


Figure 1-3. Open Blister.

STEP 3: You open the blister by sticking it at the lower edge with the sterilized needle (Figure 1-3).

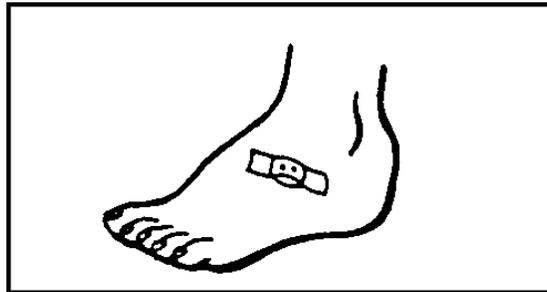


Figure 1-4. Apply Compress.

Step 4: You apply and secure a sterile compress (Figure 1-4).

Once you have started to march, it is important that you keep your feet as dry as possible. If your socks become damp or wet, you must change them for dry socks as soon as you can. You can dry your damp socks by putting them under your shirt around your waist.

If you develop tender pressure spots on your feet while marching, you should relieve the pressure promptly by adjusting your gear or applying adhesive tape to the sore spots. Once or twice each day when you are marching, you should dust your feet lightly with foot powder.

While marching, you should inspect your feet at each rest period for sore spots or blisters. If possible, you should wash your feet each day at your noon break. During rest periods, raising your feet will help to reduce congestion and swelling.

2. Human Solid Waste Disposal.

When you are on the march, you should use a cat-hole latrine during short halts to dispose of human solid waste. To make a cat-hole latrine, you dig a hole approximately one foot deep. After you use the latrine, you cover the hole completely and pack down the dirt.

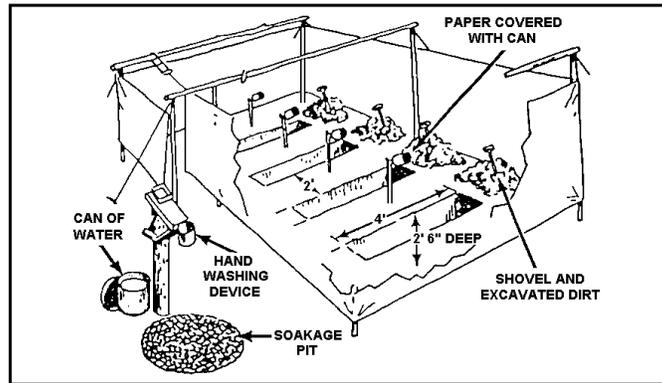


Figure 1-5. Straddle Trench.

While on the march, if you have to bivouac overnight, you should construct a straddle trench (Figure 1-5). Details for the construction of a straddle trench will be given in a later lesson in this subcourse.

3. Heat and Cold Injuries.

To prevent heat injuries, your body needs water and salt.

Your body needs a minimum amount of water for cooling, waste elimination, and metabolism. If you try to train your body to do without water, you may have heat injuries. You should drink water whenever you need it to quench your thirst.

When you lose water through sweating, you also lose body heat. When your water intake is less than one gallon a day, your ordinary diet contains enough salt to replace that which you lose through sweating. If heat and exercise cause your daily water intake to increase over one gallon, you should lightly salt your food from your field ration pack. The first aid treatment for heat injuries will be discussed in a later lesson.

Your clothing in cold weather protects, insulates, and ventilates your body. Your clothing protects your body by covering it. It insulates you by trapping air that has been warmed by your body and holding that air near your skin to prevent the loss of body heat. Your clothing ventilates by allowing an exchange of air through its various layers, which prevents overheating and excessive sweating. In cold weather you should wear clean, dry clothing in loose layers to allow for freedom of movement and exercise.

In cold weather, you must maintain good circulation. You can do this by exercising your feet and legs. While on a march, you must exercise on your rest breaks to maintain good circulation.

During cold weather marches, you should be paired with a "buddy." You will be able to encourage each other to do warming exercises at rest breaks. You must also watch each other closely for symptoms of frostbite or trench foot. The symptoms and first aid for cold weather injuries will be discussed in a later lesson.

Before going on to Part B of this lesson, you should review the material already presented. Preventive medicine will preclude sickness or injury or make them less severe if they do occur. Remember! Good health is a personal responsibility. By preventing sickness or injury, you are ensuring your availability for duty when you are needed.

PART B - HEALTH MAINTENANCE

1. Personal Hygiene.

Because you frequently will find close living quarters in an Army environment, your personal hygiene is extremely important. As a result of these close living conditions, disease or illness can spread rapidly and affect an entire unit. The preventive medicine procedures in Part A of this lesson will decrease the chances of sickness, and good personal hygiene practices will further lessen the likelihood of widespread illness.

Uncleanliness or disagreeable odors can affect the morale and effectiveness of an entire unit. Whenever possible, you must take a daily shower or bath (the construction of a field shower will be the subject of a later lesson) to prevent body odor and maintain necessary cleanliness. Your bath or shower will also aid you in preventing many common skin diseases. If baths and showers are not available, you should use a washcloth daily to wash your genital area, armpits, and feet. After your bath or shower, you should use medicated powders and deodorants to keep your skin dry.

As was pointed out in Part A of this lesson, special care of your feet is important. You should wash your feet daily and use foot powder to help keep them dry.

2. Diarrhea and Dysentery.

Dysentery is a medical term applied to a number of intestinal disorders which are characterized by stomach pain and diarrhea involving the passage of mucus and blood. Diarrhea and dysentery may result from poor sanitation conditions and can adversely impact the combat effectiveness of entire units. These internal diseases are usually spread through contact with infectious organisms which can be spread in human waste or by flies and other insects. Improperly prepared or disinfected food and water supplies also can be an origin of these diseases. If you have diarrhea or dysentery, medical personnel can advise you on the cause and severity of your illness.

There are several simple principles that can assist you in preventing diarrhea and dysentery.

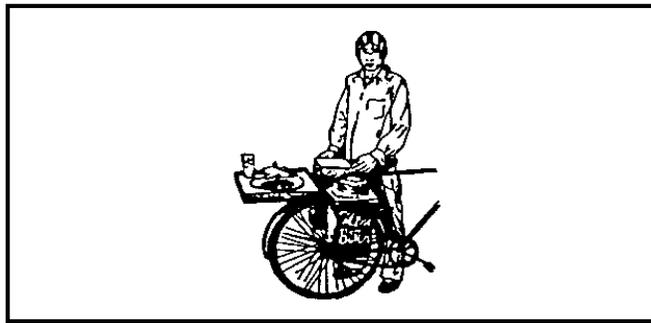


Figure 1-6. Avoid Local Vendors.

You must never buy food, drinks, or ice from civilian vendors (Figure 1-6) unless such purchases are approved by medical personnel.

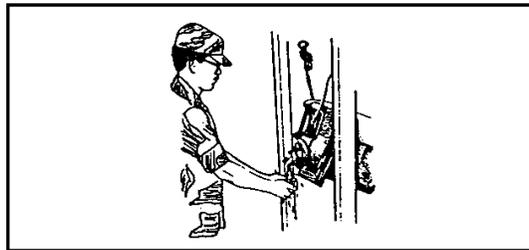


Figure 1-7. Wash Hands.

You must wash your hands (Figure 1-7) for at least thirty seconds after using the latrine or before touching food.

You always must wash your mess kit in a mess kit laundry or with "treated water."

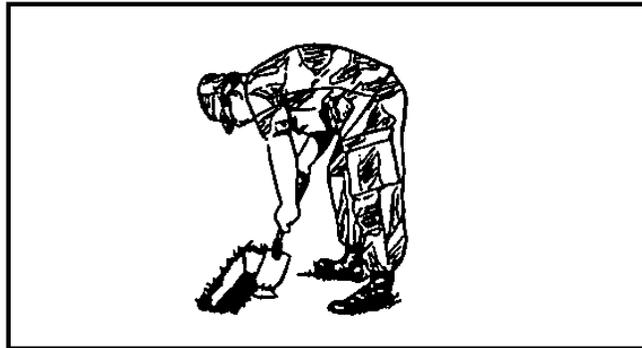


Figure 1-8. Bury Waste.

You must bury your waste (Figure 1-8) immediately to prevent flies from spreading organisms from your food waste.

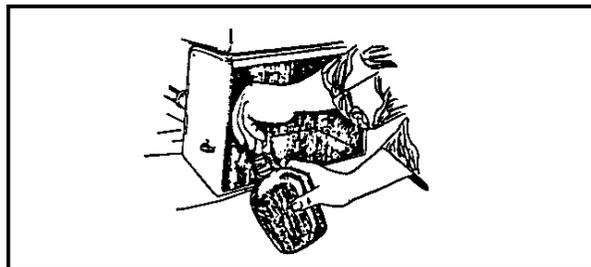


Figure 1-9. "Treated Water"

Contaminated water is one of the primary causes of diarrhea and dysentery in the field. To avoid contaminated water, you should fill your canteen with "treated water" (Figure 1-9) at every chance. When "treated water" is not available, you must disinfect your drinking water in your canteen by boiling it or using either iodine tablets or chlorine ampules. You can obtain iodine tablets or chlorine ampules through your unit supply channels or from your field sanitation team.

To disinfect water by boiling it, you should bring the water to a rolling boil and maintain that rolling boil for five to ten minutes. In an emergency, boiling water for even fifteen seconds will help you to disinfect it. After boiling, you must allow the water to cool before attempting to drink it.

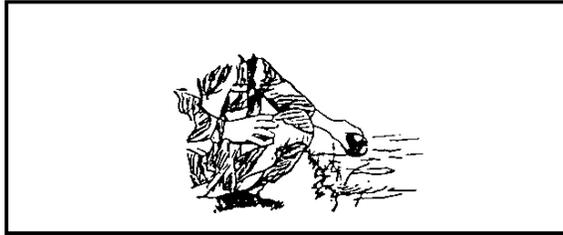


Figure 1-10. Get Clean Water.

To disinfect water using iodine tablets, you remove the cap from your canteen and fill your canteen with the cleanest water available (Figure 1-10).

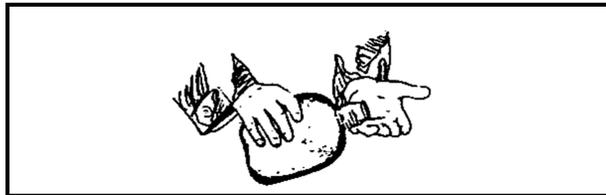


Figure 1-11. Add Tablets.

You put one iodine tablet in clear water (Figure 1-11) or two iodine tablets in very cold or cloudy water. If you are using a two-quart canteen you must double the number of tablets you add.

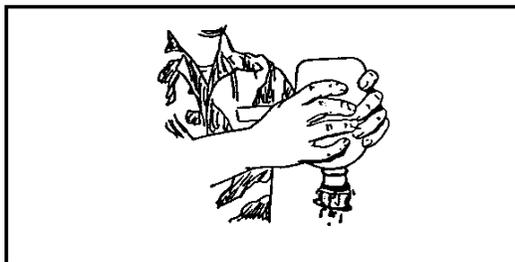


Figure 1-12. Shake Canteen.

You replace the canteen cap, wait five minutes, then shake your canteen. You then loosen the canteen cap and tip the canteen over to allow leakage around the canteen threads (Figure 1-12). You should tighten the cap and wait an additional twenty-five minutes before you drink the water.

To disinfect water using chlorine ampules, you remove the cap from your canteen and fill your canteen with the cleanest water available (Figure 1-10). You mix one chlorine ampule with one-half a canteen cup of water and stir the mixture with a mess kit spoon until the contents are completely dissolved. You must be careful not to cut your hands when breaking the glass ampule. You pour one canteen capful of the chlorine solution into your one-quart canteen of water. You use two capfuls for a two-quart canteen. You replace the canteen cap and shake the canteen. You then loosen the cap and tip the canteen over to allow leakage around the canteen threads (Figure 1-12). Finally, you tighten the canteen cap and wait thirty minutes before drinking the water.

3. Dental Hygiene.

It is essential that you care for your mouth and teeth by daily use of a toothbrush and dental floss (Figure 1-13) after meals. Daily dental care may prevent gum disease, infection, and tooth decay. One of the major causes of tooth decay and gum disease is plaque. Plaque is an almost invisible film of decomposed food particles and millions of living bacteria. To prevent dental diseases, you must effectively use your toothbrush and dental floss to remove this destructive plaque.

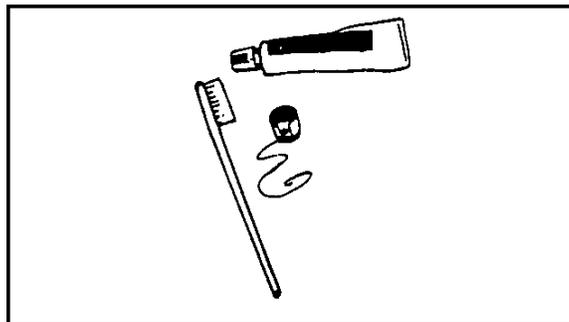


Figure 1-13. Dental Hygiene Aids.

This completes this lesson on preventive medicine and health maintenance. Before you complete the practice exercise for this lesson, you should review the material contained in the lesson. A thorough understanding and practice of preventive medicine and health maintenance procedures will make you healthier, happier, and more productive. These procedures will help you to avoid many health problems and cause illnesses you do get to be less severe.

LESSON ONE

Practice Exercise

The following items will test your knowledge of the material covered in this lesson. There is only one correct answer for each item. When you have completed the exercise, check your answers with the answer key that follows. If you answer any item incorrectly, study again that part of the lesson which contains the portion involved.

Situation: You are a member of a unit which is deploying to Fort A. P. Hill for two weeks of field training. One part of this training will be a 50 mile road march. During the training, you must practice preventive medicine techniques and health maintenance habits to ensure that you will successfully complete the training period.

1. Before the road march, you discover a blister on your foot. The first step you would take to treat the blister would be to
 - A. sterilize a needle by heating it in a flame.
 - B. open the blister by sticking it at its lower edge.
 - C. wash the blister and surrounding area with soap and water.
 - D. apply and secure a sterile compress.
2. During the road march, you should wash your feet
 - A. at each rest period.
 - B. at your noon break.
 - C. before and after the march.
 - D. only after the march.
3. While on the road march, you must dig a cat-hole latrine for human solid waste disposal. You would dig this latrine approximately
 - A. one foot deep.
 - B. two feet deep.
 - C. three feet deep.
 - D. five feet deep.
4. During the field training, you must take a daily shower or bath. After you take your bath or shower, you must use medicated powder and deodorants to
 - A. fight infection.
 - B. ensure you smell good.
 - C. keep your skin dry.
 - D. prevent skin ulcers.

5. While in a bivouac during the field training, diarrhea and dysentery might cause you health problems. To protect yourself against these diseases, you must avoid
 - A. hot, spicy foods.
 - B. losing sleep and getting too tired.
 - C. overexertion.
 - D. poor sanitation.

6. To protect yourself from diarrhea, after using the latrine or before touching food, you must wash your hands
 - A. for at least thirty seconds.
 - B. with lye soap.
 - C. with a strong disinfectant.
 - D. in running water.

7. You must purify water for your personal use. You have treated the water in your canteen with a chlorine ampule. Before drinking the water, you must wait
 - A. five minutes.
 - B. ten minutes.
 - C. twenty minutes.
 - D. thirty minutes.

LESSON ONE

PRACTICE EXERCISE

ANSWER KEY AND FEEDBACK

<u>Item</u>	<u>Correct Answer and Feedback</u>
1.	<p>C. Wash the blister and surrounding area with soap and water.</p> <p>To help guard against infection, the blister and the area around the blister should be washed clean with soap and water before you open the blister. (Page 2)</p>
2.	<p>B. At your noon break.</p> <p>Washing and drying your feet well at your noon break will help prevent blisters and other skin irritations. You should change to clean, dry socks after washing your feet. (Page 3)</p>
3.	<p>A. One foot deep.</p> <p>As a cat-hole latrine is used while you are on a march, you dig it approximately one foot deep and after use, cover the hole completely and pack down the dirt. (Page 4)</p>
4.	<p>C. Keep your skin dry.</p> <p>Deodorants and medicated powders keep your skin dry and reduce the likelihood of skin irritation. (Page 5)</p>
5.	<p>D. Poor sanitation.</p> <p>The most likely cause of diarrhea and dysentery is poor sanitation which provides a breeding ground for flies and other insects which can transmit these diseases. (Page 6)</p>
6.	<p>A. For at least thirty seconds.</p> <p>After using the latrine and before eating, you should wash your hands for at least thirty seconds to fight germs and bacteria which could cause disease. (Page 7)</p>

Item Correct Answer and Feedback

7. D. Thirty minutes.

After treating the water in your canteen with chlorine, you must wait at least thirty minutes for the disinfecting process to work before you drink the water. (Page 9)

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LESSON TWO

INDIVIDUAL AND LEADERSHIP PREVENTIVE MEDICINE COUNTERMEASURES

OVERVIEW

LESSON DESCRIPTION:

In this lesson you will learn to use individual and leadership preventive medicine countermeasures.

TERMINAL LEARNING OBJECTIVE:

- TASKS:** Identify individual and leadership preventive medicine countermeasures.
- CONDITIONS:** Given the subcourse material contained in this lesson.
- STANDARDS:** The student will demonstrate his comprehension and knowledge of the task by identifying the preventive measures for heat and cold injuries, hypothermia, biting insects, diarrhea, heat condition, and the wind chill factor.
- REFERENCES:** The material contained in this lesson was derived from the following publications:
- FM 21-10/AFM 161-10.
 - FM 21-11.

INTRODUCTION

Military operations can occur in a variety of climatic conditions from the cold Arctic conditions in the Aleutian Islands or northern Norway to the hot tropical conditions in Central America or Southeast Asia. Climate-related injuries are usually preventable, and prevention is both an individual and leadership responsibility. Several factors can contribute to your health in any environment. These are diet, sleep/rest, exercise, and suitable clothing. These factors become particularly important when extremes in weather are involved.

PART A - INDIVIDUAL PREVENTIVE MEDICINE COUNTERMEASURES

1. Heat Injuries.

Heat injuries are environmental injuries which may result from you being exposed to extreme heat, such as prolonged exposure to the sun or high temperatures. You can prevent heat injuries by drinking adequate amounts of water, wearing proper clothing, and observing appropriate work and rest cycles. Certain categories of soldiers, such as basic trainees, those with a previous history of heat injury, and overweight soldiers, have a greater risk of heat injury. If you fall into any of these categories, you should take special precautions to avoid becoming ill due to extreme heat.

What you eat can be particularly important in avoiding heat injuries so you should ensure your diet is suited to the conditions under which you are operating. You must be sure, however, that your diet is balanced and contributes to all your body's needs (Figure 2-1). Under most circumstances, including hot weather, a balanced diet will provide enough salt to replace that which you lose through sweating. In unusual conditions, you can increase your salt intake by lightly adding salt to your normal food. You should never supplement your diet with salt tablets unless directed to do so by medical personnel.

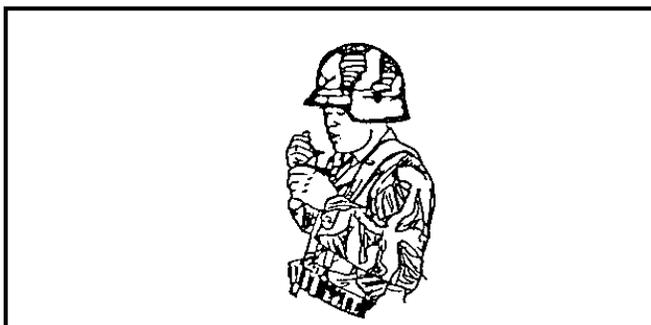


Figure 2-1. Eat A Balanced Diet.

The type and amount of clothing and equipment you wear can affect your body and its ability to adjust to climatic conditions. As a general rule, your clothing will help protect your body from radiant heat. However, tight fitting clothing, web equipment and your pack will reduce the ventilation your body needs to be cool. If your mission permits, these items should be removed at rest breaks to allow air to circulate freely about your body. In extremely hot weather and if your commander authorizes it, you can help avoid heat injuries by modifying your uniform (Figure 2-2).



Figure 2-2. Uniform Modified For Heat Conditions.

If there is no danger from biting insects, you can unblouse your pants from your boots and loosen your clothing at your neck, wrists, and lower legs. You should work and rest in the shade, if possible. You should always keep your skin covered when you are in direct sunlight, but removing your shirt when in the shade will help to keep you cool.

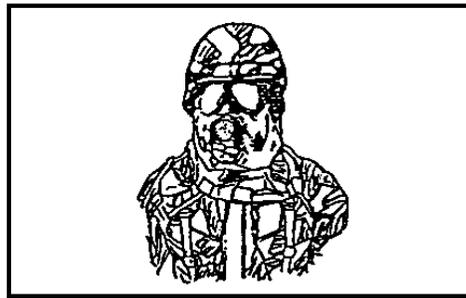


Figure 2-3. Individual Protective Equipment.

Individual protective equipment (IPE) (Figure 2-3) protects you from chemical and biological agents by placing a protective barrier between you and the toxic environment. However, IPE can frequently cause heat stress because it does not allow your body to cool itself normally. When wearing IPE, you should drink more water than you usually do and observe a work/rest cycle as directed by your supervisor. You must strictly adhere to the mission oriented protective posture (MOPP) directed by your unit commander. You should also increase your water intake when you are operating in armored vehicles.

When operating in extremely hot climates, you must take special steps to prevent heat injuries. As you sweat, your body may be losing more than a quart of water each hour. Your body needs this fluid because it depends on water to keep itself cool. The ideal fluid replacement is water (Figure 2-4).



Figure 2-4. Drink Plenty of Water.

As your body is depending on sweating to keep it cool, you must replace lost fluids as quickly as possible. You may need to drink as much as one-half to two quarts of water each hour or four gallons or more water a day in hot dry climates. A simple test to determine whether you are drinking enough water is to check your urine. If your urine is dark yellow, you should increase your water intake. In extremely hot conditions, you should begin to drink extra water before you start to work or train. You should drink small quantities of water frequently, even if you aren't thirsty, and refill your canteen at every opportunity.

If you suffer a heat injury, you are more likely to suffer another than is someone who has never had a heat injury. Before you return to duty after suffering a heat injury, you must ensure that you have recovered enough so that the injury will not recur. Other conditions which may increase heat stress and cause heat injury include infections, fever, recent illness or injury, obesity, dehydration, overexertion, fatigue, eating heavy meals, and drinking alcohol.

There are three categories of heat injuries. These are heat cramps, heat exhaustion, and heatstroke.

Heat cramps are caused by your body having a deficiency of salt. As you sweat, you not only lose water; but you also lose salt from your body. If you get heat cramps, you will have muscle cramps in your arms and legs and possibly will suffer from stomach cramps as well. You may also have wet skin and be extremely thirsty.

To treat yourself or a member of your unit for heat cramps, you should move the person to a shady area or improvise shade and loosen his clothing. You should have the person slowly drink at least one canteen of water (Figure 2-5). If the cramps continue after this treatment, you should seek medical aid.



Figure 2-5. Slowly Drink a Canteen of Water.

Heat exhaustion occurs when you lose fluids from your body by sweating and do not adequately replace this water loss. A person suffering from heat exhaustion will feel weak or faint. He may be dizzy or sleepy. His skin will be cool and moist, and he may be extremely pale. The person may have a headache and have lost his appetite. Sometimes, a heat exhaustion casualty will have heat cramps and be nauseated with or without vomiting. He may have an urge to defecate. The person may suffer chills, shortness of breath, confusion, or a tingling of his hands or feet.

To treat heat exhaustion, you must cool the person immediately. Move him to a shady area or improvise shade and have him lie down. Loosen or remove the casualty's clothing and boots unless you are in a biological or chemical environment. Pour water on him (Figure 2-6) and fan him. Elevate his legs and have him slowly drink at least one canteen of water. If operational requirements will allow it, the person should not participate in any strenuous activity for the rest of the day. You should watch the person closely until the heat exhaustion symptoms are gone; and if the symptoms persist, seek medical aid.

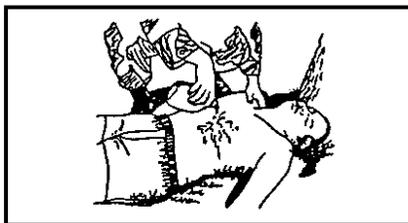


Figure 2-6. Remove Clothing and Pour Water on Him.

Heatstroke, which is also called sunstroke, is the most serious of the heat injuries. Heatstroke is a medical emergency and can result in the death of the person afflicted if it is not treated promptly and correctly. It is caused by a failure of the body's cooling mechanisms. On a hot day if you or a member of your unit ceases to sweat, the person is in danger of developing heatstroke. If a person is suffering from heatstroke, his skin will be flushed, hot, and dry. He may suffer from dizziness, confusion, headaches, seizures, nausea, and his pulse and breathing may be rapid and weak. The person may suddenly lose consciousness and collapse.

To treat heatstroke, you must cool the person immediately by moving him to a shaded area and removing his clothing (Figure 2-7) and/or protective garments unless you are in a biological or chemical environment. Pour water on the person or if possible, immerse him in water while fanning him to cool him by evaporation. Elevate his legs, massage his skin, and if he is conscious, have him slowly drink water. As heatstroke is a medical emergency, transport the victim to a medical facility as soon as possible. You must not delay evacuation to start cooling measures but should perform the cooling procedures while en route to the medical facility.



Figure 2-7. Remove the Clothing.

2. Cold Injuries.

Although cold injuries are most likely to occur when you are not properly prepared to operate in extremely cold temperatures, they can occur even when you have planned for the cold and are using the proper equipment. Your clothing, physical condition, and mental attitude also affect your susceptibility to cold injuries. Most cold injuries are preventable. You must pay particular attention to personal hygiene, exercise, care of your hands and feet, and use of protective clothing.

There are five contributing factors for cold injuries. These factors are weather, the type of combat operation, clothing physical makeup, and the psychological factor.

Weather conditions such as temperature, humidity, precipitation, and wind affect the loss of body heat. Sometimes, two or more of these factors act together to make a particular type of cold injury more likely. For instance, low temperatures with low relative humidity promotes frostbite. Higher temperatures with moisture promotes immersion syndrome. Windchill, which will be discussed in another part of this lesson, will accelerate your body's loss of heat and may aggravate cold injuries.

Certain types of combat operations are more likely to lead to cold injuries than others. Defense, delaying, observation-post, and sentinel duties create greater fear fatigue, dehydration, and lack of nutrition. These factors make you more vulnerable to cold injury. Additionally, you are more likely to receive a cold injury if you are often in contact with the ground or immobile for long periods of time. Standing in water or being out in the cold for several days without being warmed will increase your likelihood to get a cold injury. If you are deprived of an adequate diet and rest and unable to take care of your personal hygiene, you will be more susceptible to cold injuries.

Wearing proper clothing is one of the most important ways to protect yourself in cold weather. You should wear several layers of loose clothing (Figure 2-8). You should always dress as lightly as the weather permits to avoid excessive sweating which will increase your chances of getting chilled. When working or training in cold weather, it is better for you to be slightly cold and generating heat than to be too warm which can cause dehydration. You should remove a layer or two of clothing when participating in strenuous physical activity and put your clothes back on when your activity is completed.



Figure 2-8. Wear Layers of Loose Clothing.

Protecting your hands and feet is especially important. You should wear gloves with inserts or mittens and should warm your hands under your clothing if they get numb (Figure 2-9). You should never let your bare hands come into contact with snow, fuel, or bare metal.



Figure 2-9. Warm Your Hands.

In the field, you should take at least five pairs of clean, dry issue boot socks with you. If your socks become wet or damp you should change them (Figure 2-10). You should wash your feet daily and wear overshoes to keep your boots and feet dry. Most cold injuries result from having too few clothes available when the weather turns suddenly colder. You must plan for the types of clothing you may need and ensure you have the proper clothes if the weather gets colder. Wet gloves, shoes, socks, or any other wet clothing add to the cold injury process.



Figure 2-10. Change Wet Socks.

Physical fatigue contributes to apathy which causes inactivity, personal neglect, carelessness, and reduced heat production. All these factors increase the risk of cold injury. To keep your body warm, you should keep moving, if possible and exercise your big muscles (shoulders, trunk, and legs). If your ability to move is restricted, you should exercise your

toes, feet, fingers, and hands. You should not smoke because smoking decreases the flow of blood to your skin. You must eat all meals to maintain your energy level and drink plenty of water or warm nonalcoholic fluids. As discussed in Lesson One, you should pair up with a "buddy" to guard against cold injuries.

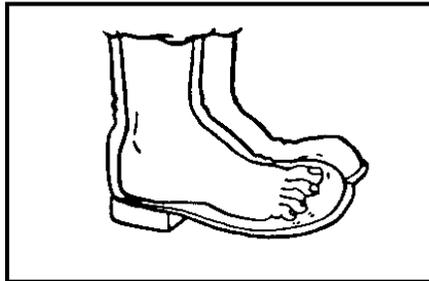


Figure 2-11. Exercise Your Toes.

Mental fatigue and fear reduce your body's ability to rewarm itself. If you are depressed or unresponsive, you are more likely to incur a cold injury because you will be less active. If you have any of these psychological problems, you may be careless about precautionary measures, especially warming activities, and thus increase your chance of cold injury.

Now that you are familiar with the factors which contribute to cold injuries, you must learn to recognize the symptoms of cold injuries.

You may suffer a cold injury without realizing it. You may be generally cold and uncomfortable and not notice that a part of your body is already numb. The "buddy" system can help you avoid this by asking each other regularly if your feet, hands, or face are numb and need warming.

You can detect superficial cold injuries by numbness, tingling, or a "pins and needles" sensation. Frequently, you can relieve these symptoms by loosening your boots or clothing and exercising to improve your circulation. If you have a deep cold injury, you may be unaware of the problem until the affected part of your body feels like a block of wood.

A sign of a cold injury is a discoloration of the skin at the site of the injury. In light-skinned persons, the skin will redden then become pale and waxy white. In dark-skinned persons, the skin looks gray around the injury. If a foot or hand is injured, it will feel cold to the touch. A deep cold injury may be indicated by swelling. Again by working with a "buddy," you can check each other for discoloration or other signs of injury.

In general, treatment for cold injuries depends on whether the injury is superficial or deep. Superficial cold injuries can be treated adequately by warming the affected part using body heat. This can be done by covering your cheeks with your hands, putting your fingertips under your armpits, or placing your feet under the clothing of a "buddy" against his belly (Figure 2-12). The injured part must not be massaged, exposed to a fire or stove (Figure 2-13), rubbed with snow, slapped, chafed, or soaked in cold water. You should avoid walking on injured feet. Deep cold injuries are very serious and require more aggressive first aid. The quicker first aid is applied to a deep cold injury; the less likely you are to lose parts of your body to the injury. If the injury is life threatening, priority must be given to removing the victim from the cold and treating the injury. Injuries that are not cold related can be treated simultaneously while waiting for transportation or while en route to a medical facility.



Figure 2-12. Warming Feet.

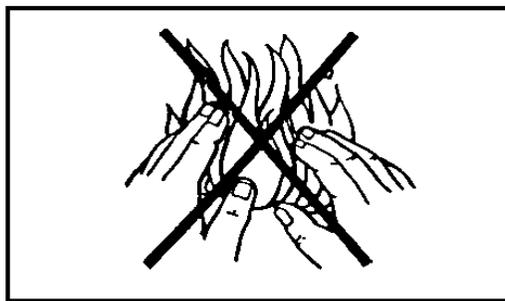


Figure 2-13. Don't Warm At A Fire.

The major conditions caused by cold are chilblain, immersion syndrome (trench foot), frostbite, snow blindness, dehydration, and hypothermia. The symptoms, treatment, and prevention of each of these injuries will be discussed separately.

Chilblain is caused by repeated prolonged exposure of bare skin at temperatures from 60°F to 32°F, or 20°F for acclimated, dry, unwashed skin. To identify chilblain, you look for an area of skin that is swollen, red, tender, hot, and itchy. If you don't treat this injury, there may be no loss of skin, but continued exposure can lead to infected, ulcerated, or bleeding lesions.

To treat chilblain, you should warm the affected area with locally applied body heat. You rewarm the area by applying firm steady pressure with your hands, or placing the affected area under your arms or against the stomach of a "buddy." You must not rub or massage the affected part. You should have medical personnel evaluate the injury, because symptoms of tissue damage may be slow to appear.

To prevent chilblain, you follow the basic cold prevention procedures discussed earlier in this lesson. Wearing proper protective clothing, and remaining as dry as possible are particularly important.

Immersion syndrome (trench foot) results from fairly long exposure of the feet to wet conditions at temperatures from about 50° to 32°F. If your feet are inactive in damp or wet socks and boots, or tightly laced boots impair your circulation, you are particularly susceptible to this cold injury. Immersion syndrome is a serious injury which can lead to the loss of toes or parts of the feet. This occurs when the exposure of the feet has been prolonged and severe. The feet may swell, and pressure from the swelling can close blood vessels and cut off circulation.

If you get immersion syndrome, the affected parts of your foot will be cold and painless, the pulse in your foot will be weak, and your foot may be numb. In the intermediate stage, your foot will feel hot with burning and shooting pains as it is warmed. Within 24 to 48 hours, your foot will be pale with a bluish tint and your pulse will decrease. Other symptoms can include blistering, swelling, redness, heat, bleeding, and gangrene.

You must treat immersion syndrome in all its stages. You should warm the injured part slowly by exposing it to warm air. You must not massage the foot or moisten the skin. You must not apply heat or ice and must never expose the injured foot to an open fire. You should dry your foot thoroughly and warm it with dry loose clothing or several layers of warm (avoid extreme heat) coverings. You should elevate the injured foot to reduce swelling and evacuate the casualty to a medical facility as soon as possible. Trench foot symptoms may persist for days or weeks even after you have rewarmed the injured part.

To prevent immersion syndrome, you must take good care of your feet. (If you don't remember the preventive measures for good foot care, you should review the preventive medicine section of Lesson 1.) It is especially important not to place your feet in wet conditions for a long time. You should change your socks daily or more frequently if environmental conditions make it necessary. You can air dry your socks and warm them by putting them inside your shirt around your waist.

Frostbite is a tissue injury caused by exposure to cold, usually below 32°F. The exact temperature at which frostbite develops may vary depending on the windchill factor, the duration of exposure, and the adequacy of protection. The parts of your body most easily affected by frostbite are the cheeks, nose, ears, chin, forehead, wrists, hands, and feet. There are two types of frostbite. Superficial frostbite involves only the skin. Deep frostbite extends to tissue at a depth below the skin. Deep frostbite is a serious condition requiring aggressive first aid measures to avoid or minimize the loss of parts of fingers, toes, hands, or feet.

The signs or symptoms of superficial frostbite are progressive usually following a pattern. The first sign of frostbite is usually a loss of feeling or numbness in an affected body part. The numbness is followed by a sudden blanching or loss of color of the skin followed by a short "tingling" sensation. Next, there will be a redness of skin in a light-skinned person or a grayish tint to the skin of a dark-skinned person. Then, there is blistering and swelling or tender areas. Next, there will be a loss of pain in the affected area; and the skin will be pale, yellowish, and waxy looking. Finally, there will be frozen tissue that feels solid or wooden when you touch it. While all of these symptoms may not always be present or two or more signs may occur together, you can identify a superficial frostbite injury by looking for some combination of these signs.

To treat frostbite on the face, ears, or nose, you should cover the affected area with your bare hands until sensation and color return. To treat frostbite of the hands, you should open your field jacket and shirt and place your affected parts under your armpits. Then, you close your shirt and field jacket to prevent further exposure. In treating frostbitten feet, you should not attempt to thaw your feet if you must walk to receive additional treatment. If walking is not required, you should remove your boots and socks and place your feet against a "buddy's" body under his clothing.

No matter which part of the body is frostbitten, there are certain things you must do and others that you must not do. With frostbite, you should continually monitor the victim for the development of conditions which may be life threatening.

You must always keep the person warm and covered to prevent further injury. You should reassure the affected person and cover the affected area lightly with a blanket or dry clothing and shelter the victim from the wind. You should remove constricting clothing and increase insulation if conditions permit. You must ensure the person exercises as much as possible without causing additional injury. You should prepare the casualty for pain as the affected area thaws. Most importantly, you should protect the frostbitten area from further injury and seek medical treatment as soon as possible.

For a frostbite injury, what you must not do is almost as important as what you do to protect against further injury. You should not rub the injured part with snow or soak the area in cold water. You must not massage the injured area or manipulate it in anyway to increase circulation. You must never expose the injury to an open fire because the frozen part may be burned due to a lack of feeling. You should not apply ointments or other medications. You never allow the injured person to use tobacco or alcohol as those substances reduce your body's resistance to cold.

To prevent frostbite, you should pay special attention to good nutrition, particularly hot meals and warm fluids. Proper clothing and the maintenance of your general body temperature through exercise are also important. You should avoid fatigue, dehydration, tobacco, and alcoholic beverages.

Your clothing is the most important factor in preventing frostbite. You should wear several layers of loose clothing. The layering of clothing is especially important. You can remove clothing to avoid excessive sweating while you work or exercise and replace the layers when you become more inactive. This will help to keep your clothing and body as dry as possible. Whenever your socks become moist or wet, you must replace them with clean dry ones. The proper fitting of your clothes is also important. Clothing that is too tight interferes with blood circulation and reduces the amount of heat that reaches your extremities. Tight fitting socks, boots, and gloves are especially dangerous in very cold climates. Your face needs extra protection against high winds. A mask or headgear tunneled in front of your face guards against direct wind injury. If you don't have frostbite, you should massage your face and ears with your hands to increase circulation and warmth. You should exercise your fingers and toes to keep them warm and detect numbness which is the first sign of frostbite. You should wear windproof gloves or mittens. You should avoid getting gasoline, kerosene, or alcohol on your skin and never touch cold metal with your bare skin. As stated earlier, the "buddy" system should be used so you can check each other for the first

signs of frostbite. When you are inactive it is still important to have adequate clothing and shelter to maintain warmth.

Snow blindness is the effect that glare from an ice field or snowfield can have on your eyes. Because you will instinctively protect your eyes from sun glare, snow blindness is more likely to occur in cloudy or hazy weather. On a cloudy day, you may expose your eyes to the glare longer than you would when the threat is more obvious. You also may neglect precautions such as wearing protective eyewear. If you wait until your eyes hurt before wearing protective eyewear, a deep burn of your eyes may have already occurred.

The main sign of snow blindness is a sensation of grit in your eyes with pain in and over your eyes. Moving your eyeballs will increase this pain. Other symptoms are watering or redness of the eyes, headache, and increased pain from exposure to light. The conditions that cause snow blindness also can cause snowburn of skin, lips, and eyelids.

To treat snow blindness, you cover your eyes with a dark cloth which will stop painful eye movement. A complete rest of your eyes is desirable. If further exposure is required, you must protect your eyes with dark bandages or the darkest glasses available. Once you stop the unprotected exposure to the sun, your eyes should heal in a few days with no permanent damage. You should, however, evacuate a snow blindness victim to the nearest medical facility.

To prevent snow blindness, you must put on protective eyewear. In an emergency when you don't have protective eyewear, you can make a substitute. You need a piece of wood or cardboard cut and shaped to the width of your face. You cut slits for the eyes and attach strings to hold the device in place. You cut the slits at the point of vision to allow enough space to see while you reduce the risk of injury. You can also blacken your eyelids and face around your eyes to absorb harmful rays.

Dehydration occurs when your body loses too much fluid, salt or minerals. Although you lose body fluid through normal body processes, your normal daily intake of food and liquids replaces these losses. However, you lose an excessive amount of fluid and salt when engaged in strenuous activity. This excessive loss creates an imbalance of fluids, and dehydration occurs if fluid and salt are not replaced. The danger of dehydration is just as great in cold regions as in hot regions. However, in hot weather, you are aware of losing fluids and salt through sweating. In cold weather, you are less aware of your fluid loss because sweat evaporates rapidly or is absorbed by your clothing. Also the inconvenience of

drinking in cold weather can lead to dehydration. If you become dehydrated, it may take from a few hours up to several days to recover. You must be careful when recovering from dehydration that the rest required by the recovery process does not lead to other cold injuries.

The symptoms of cold weather dehydration are similar to those for heat exhaustion. Your mouth, tongue, and throat will be dry; and you will have difficulty swallowing. You may have nausea with or without vomiting. You may be dizzy or faint. You also will feel generally tired and weak. You may have muscle cramps (especially in your legs). Focusing your eyes may be difficult.

To treat dehydration, you should keep warm and loosen your clothing to aid circulation. You should seek shelter from wind and cold. Fluid replacement, rest, and prompt medical attention are critical to your recovery. You should allow medical personnel to determine your need for salt replacement.

The same preventive measures apply to dehydration in both hot and cold weather. You must take enough extra liquids to offset those your body is losing. The amount of extra fluid you need will depend on your body's metabolism and the type of work you're doing. Rest is an equally important preventive measure. Work performed while bundled in extra layers of clothing is exhausting. This is particularly true when you are walking.

Hypothermia is a general cooling of your body. It is life threatening until a normal body temperature is restored. Under some conditions, such as cold water immersion, you can die in a few minutes even if you are in excellent physical condition. In hypothermia, your body loses heat faster than it can produce heat. Hypothermia and frostbite may occur at the same time due to exposure to below freezing temperatures. Physical exhaustion or not eating enough may increase the risk of hypothermia as can the excessive use of alcohol leading to unconsciousness. General cooling of the entire body to a temperature below 95°F is caused by continued exposure to low or rapidly dropping temperatures, cold moisture, snow, or ice. Other causes of hypothermia are fatigue, poor physical condition, dehydration, faulty blood circulation, alcohol or other drug intoxication, trauma, and immersion. Cold can affect your body systems so slowly that you don't notice it. If you are exposed to low temperatures for a long period of time, you may suffer cold injury even if you are well protected by clothing.

As your body cools, you will have several stages of progressive discomfort and impairment. One sign that you will notice

immediately is shivering. Shivering is your body's attempt to produce heat. Your pulse may be faint and hard to detect. At a body temperature of 90°F, you may be drowsy and mentally slow. Your motor ability skills will be impaired. You will be stiff and uncoordinated to a point where you can only function minimally. Your speech may be slurred. As your body temperature drops further, shock becomes evident. Your eyes become glassy, your breathing is slow and shallow, and your pulse is weak or absent. You will become very stiff and uncoordinated. Unconsciousness may follow quickly. As your body temperature drops even lower, your extremities will freeze; and at a deep body temperature below 85°F, you may have an irregular heart action. This irregular heart action or heart standstill can result in death.

Except in cases of severe hypothermia, you should rewarm the body evenly and without delay. You provide heat from a hot water bottle, electric blanket, campfire, or another person's body heat. You must send for medical aid as soon as possible. You must protect the victim immediately with dry clothing or a sleeping bag and move him to a warm place. After you have begun the warming process, you can evaluate and treat other injuries. If the hypothermia victim's breathing has stopped or is irregular or shallow, you should start mouth-to-mouth resuscitation. You may gradually give the person warm liquids. However, you must never force liquids on an unconscious or semiconscious person because you might choke him. You should transport the victim on a litter as the exertion of walking could aggravate circulation problems. Any hypothermia victim should be taken immediately to a physician for treatment.

Severe hypothermia is marked by a coma or unconsciousness, a weak pulse, and a body temperature of about 90°F or below. Care providers should be aware that most thermometers, particularly commercial ones, do not measure body temperatures below 94 degrees Fahrenheit, and an assumption of severe hypothermia will have to be made if a reading of 94 degrees is registered. The treatment of severe hypothermia is based on the following principles:

- STEP 1: Stabilize the victim's temperature.
- STEP 2: Attempt to avoid further heat loss.
- STEP 3: Handle the victim gently.
- STEP 4: Evacuate the victim immediately to the nearest medical treatment facility.

It is extremely dangerous for you to attempt to rewarm a severe hypothermia victim in the field. Rewarming can cause complications such as shock and heart arrhythmia which should be treated by a physician.

To prevent hypothermia, you must avoid all actions which might lead to a rapid and uncontrollable loss of body heat. Proper clothing and equipment, proper diet, and proper rest are all important. You must ensure that you are never immersed in water in extremely cold temperatures. When traveling you should ensure you have extra clothing and food in case of emergencies.

3. Biting Insects.

The bite or sting of an insect can cause pain, inflammation, infection, and allergic reaction. If you do not treat them correctly, some bites and stings can cause a serious illness and death. You should always have medical personnel examine any bite or sting. It is important that you properly identify the insect causing the bite or sting especially in cases of an allergic reaction.

There are too many biting and stinging insects in the world to try to identify them all. When you are assigned to an area, you should find out which insects in that region that you should avoid. Some common biting insects which you may encounter include brown recluse spiders (Figure 2-13a), black widow spiders (Figure 2-14), tarantulas (Figure 2-15), scorpions (Figure 2-16), bees, wasps, centipedes, and ants.

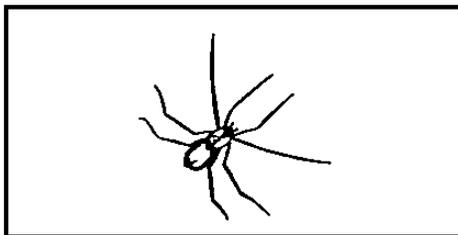


Figure 2-13. Brown Recluse Spider.

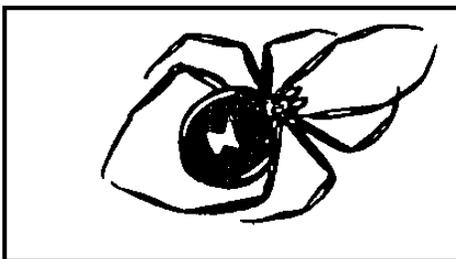


Figure 2-14. Black Widow Spider.



Figure 2-15. Tarantula.

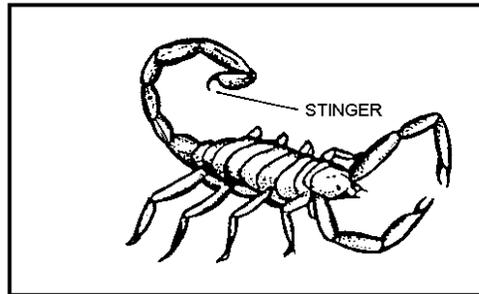


Figure 2-16. Scorpion.

Common symptoms of less serious insect bites are pain, irritation, swelling, heat, redness, and itching. Hives or wheals (bumps that itch) may occur. These are the least severe allergic reactions to insect bites or stings. They are usually dangerous only if they affect the air passages and could interfere with your breathing. The bites or stings of bees, wasps, ants, mosquitoes (Figure 2-17), fleas (Figure 2-18), and ticks (Figure 2-19) are usually not serious and normally produce mild and localized symptoms. A tarantula's bite is usually no worse than a bee sting. Scorpions are rare and their stings are painful but usually not dangerous.



Figure 2-17. Mosquito.

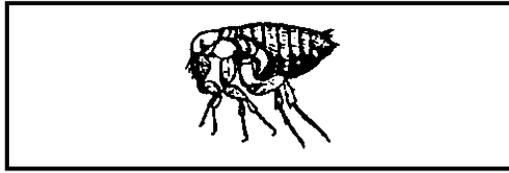


Figure 2-18. Flea.

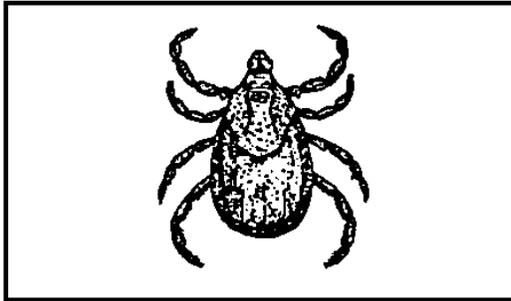


Figure 2-19. Tick.

Emergency allergic reactions occasionally result from the stings of bees, wasps, and ants. Many people are allergic to these insect's venom and have serious reactions to the sting. Reactions include itching and hives, weakness, anxiety, headache, breathing difficulties, nausea, vomiting, and diarrhea. Very serious allergic reactions, called anaphylactic shock, can lead to collapse, shock, and death. Spider bites also can be serious. Venom from the black widow spider (Figure 2-14) affects your nervous system. The venom can cause muscle cramps, a rigid nontender abdomen, breathing difficulties, sweating, nausea, and vomiting. The brown recluse spider's (Figure 2-13) venom usually causes local rather than system-wide problems. However, local tissue damage around the bite can be severe and can lead to ulcers and gangrene.

Certain principles apply to the treatment of insect bites or stings no matter what caused them.

If there is a stinger present, for example, from a bee, you remove the stinger by scraping the skin's surface with your fingernail or a knife. You must not squeeze the sac attached to the stinger as it might inject more venom into the wound.

You should wash the area of the bite or sting with soap and water, alcohol, or an antiseptic. This will help reduce the chance of infection and remove traces of venom.

You should remove your jewelry from bitten extremities because swelling is common and may occur.

In most cases of insect bites, your reaction will be mild and localized. You should put ice or cold compresses on the site of the bite or sting. This will help reduce swelling, ease your pain, and slow the absorption of venom. Meat tenderizer, to neutralize the venom, or calamine lotion, to reduce itching, may be applied locally. If you are having an allergic reaction to the bite or sting, you should seek medical aid immediately.

You may have a more serious reaction such as severe and rapid swelling or allergic symptoms. If this occurs, you should treat the bite or sting as you would a snake bite. To do this, you would apply constricting bands above and below the bite (Figure 2-20).

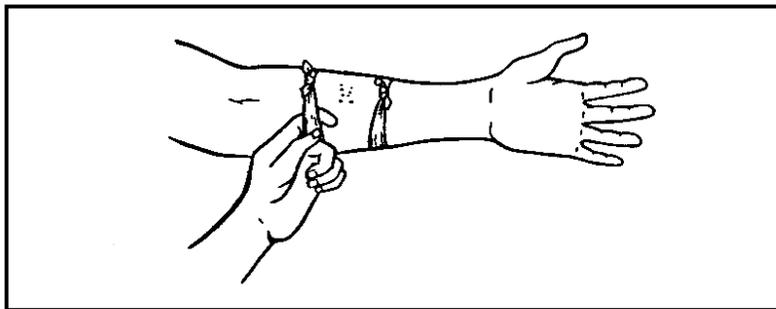


Figure 2-20. Constricting Bands.

CAUTION

Insect bites/stings may cause anaphylactic shock (a shock caused by a severe allergic reaction). This is a life-threatening event and a TRUE MEDICAL EMERGENCY! Be prepared to perform the basic life support measures and to immediately transport the casualty to a medical facility.

NOTE

Be aware that some allergic or hypersensitive individuals may carry identification (such as a MEDIC ALERT tag) or emergency insect bite kit. If the casualty is having an allergic reaction and has such a kit, administer the medication in the kit according to the instructions which accompany the kit.

In case of an allergic reaction, you must be prepared to perform basic lifesaving measures, such as rescue breathing and CPR.

You should reassure the bite victim and keep him calm.

In case of a serious reaction, you should attempt to capture the insect for positive identification. However, you must be careful not to be bitten. Also, if the reaction appears serious, you should seek medical aid immediately.

It is always better to prevent insect bites and stings than to have to treat them after they occur. Some preventive measures are use insect repellent, wear your uniform correctly, practice good personal hygiene, and protect yourself from insects at night.

You should apply insect repellent to all exposed skin (Figure 2-21). You should apply the repellent to your face, ears,

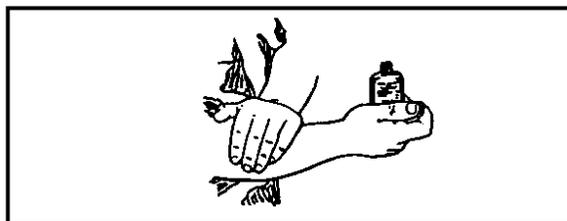


Figure 2-21. Apply Insect Repellent to Exposed Skin.

neck, arms, and hands. However, you must not allow the insect repellent to get in your eyes. You should use insect repellent where your clothing fits tightly (Figure 2-22). This would include areas such as your upper back, buttocks, and knees. You also should apply repellent to all openings of your uniform. This would include the collar, cuffs, shirt front, waistband, and boot tops. If you get wet, like at a stream crossing, you should reapply a thick coat of repellent immediately. If you are sweaty, you should reapply a thick coat of repellent every two hours. Even though you aren't sweating, you should reapply the insect repellent every four hours. As with any medication, you must read the label on the insect repellent bottle for directions and precautions before using it.

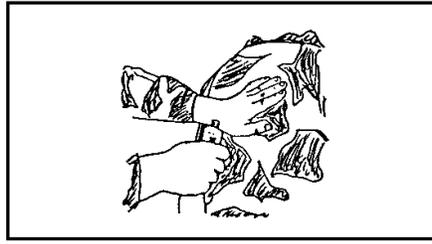


Figure 2-22. Apply Repellent Over Tight Fitting Clothes.

Although you must always wear your uniform as your commander directs, there are certain things you can do with your uniform to minimize the chances of insect bites. You should wear your headgear to protect the top of your head. You should wear a loose fitting uniform and repair holes or tears in your uniform. You should blouse your pants in your boots and completely lace your boots. You should tuck your undershirt in at the waist. You should wear your sleeves down and button your shirt at the neck and wrists.

Good personal hygiene will also reduce your risk from insect bites. If the tactical situation permits, you should wash daily. When you wash, you should pay particular attention to cleaning your groin and armpits. In the field, you should never wear after-shave lotion, cologne, or perfume. These solutions attract biting and stinging insects. You should wash your uniform (Figure 2-23) at least once a week to remove insects and their eggs. If possible, you should use the quartermaster laundry. If no quartermaster laundry is available, you can use a can, stream, or lake. If your commander directs it, you should take malaria pills. When prescribed by medical personnel, you should use insect powder, cream, or shampoo.

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Figure 2-23. Wash Your Uniform Weekly.

To protect yourself from insects at night, you should use your bednet (Figure 2-24) when sleeping. You should tuck the bednet under your sleeping pad or bag so there are no openings. You should use an aerosol insect spray inside your bednet after it is tucked. If you are in a tent, you should spray the tent if it can be sealed. You spray for only one or two seconds. Then, you allow ten minutes for the aerosol to disperse before you occupy the bednet or tent. You must repair any holes in your bednet immediately.

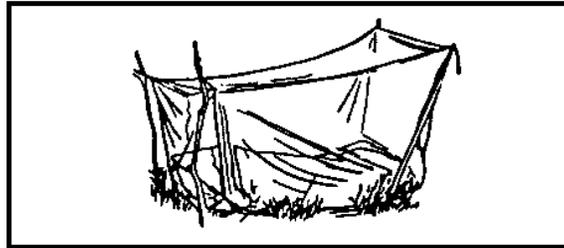


Figure 2-24. Use Your Bednet.

Before going on to the next part of this lesson which deals with leadership preventive medicine countermeasures, you should review the material that you have just completed. In dealing with heat or cold injuries and insect bites or stings, there are three steps. First, you must try to prevent injury. Second, you must recognize the signs or symptoms of a particular injury. Finally, you must know how to treat each type of injury. By knowing how to apply these steps, you can increase your chances of avoiding injuries in the field.

PART B - LEADERSHIP PREVENTIVE MEDICINE COUNTERMEASURES

1. Diarrhea.

At some point in your Army career, you will be in a leadership position for other soldiers. When you assume the leadership role, you also assume the responsibility for the welfare of the soldiers assigned to you. Part of your responsibility is to ensure that their working conditions are as healthy as possible. To protect your men from diarrhea, you must plan for safe water and food. You also must ensure that adequate field sanitation devices are available.

To plan for safe water, you must ensure your men know the location of approved water distribution points (Figure 2-25). If "treated water" is not available, you must ensure that your unit has an adequate supply of disinfecting products. You must make sure that each soldier has one bottle of iodine water purification tablets. In addition to the individual tablets,

your unit should have a supply of chlorination kits and bulk chlorine. As a leader, you must inspect water containers before they are used (Figure 2-26). You must also check the chlorine residual of water supplies before allowing it to be drunk. Thereafter, you should check the chlorine residual daily.

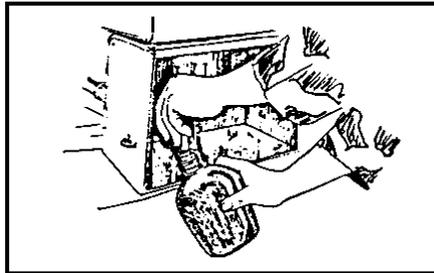


Figure 2-25. Approved Water Distribution Point.

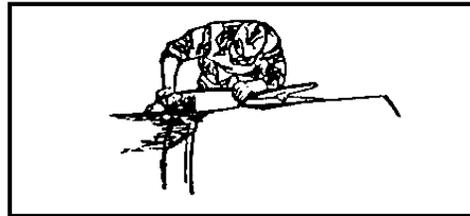


Figure 2-26. Inspect Water Containers.

To plan for safe food, you must ensure that food service personnel maintain foods at safe temperatures. Hot foods should be maintained above 140°F. Cold foods should be maintained below 45°F. You should inspect food service personnel daily. If you discover someone with an illness or a skin infection, you should refer him to medical personnel for evaluation. You must ensure that food service personnel and soldiers use hand washing devices before touching food (Figure 2-27). You must supervise the mess kit laundry (Figure 2-28) to ensure soldiers properly clean their mess kits after meals. You must make sure that all foods, drinks, or ice purchased from civilian vendors (Figure 2-29) have been approved by the command's medical authority. You must ensure that all food waste is buried (Figure 2-30) or burned daily. The burial or burning of food waste must be at least thirty yards from your food preparation area and water source.

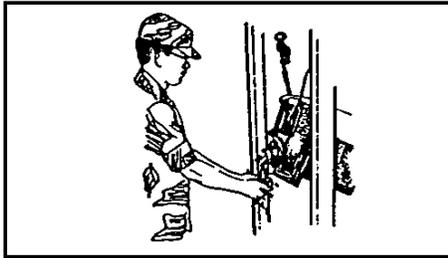


Figure 2-27. Food Service Personnel Must Wash Hands.

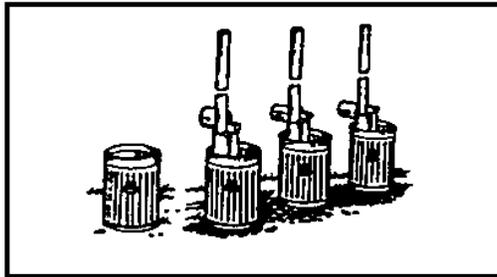


Figure 2-28. Mess Kit Laundry.

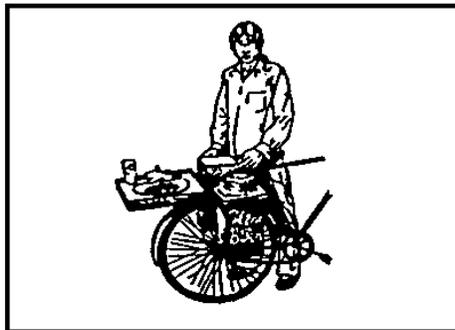


Figure 2-29. Civilian Vendor.



Figure 2-30. Bury Food Waste.

To ensure that adequate field sanitation devices are available, you must plan for their construction and maintenance.

There are certain factors you must consider in selecting the locations for your field latrines. The location should be as far from your food operations as possible. At a minimum, latrines should be at least 100 yards from food areas. If possible, latrines should be downwind and on a down slope from food operations. Latrines must also be at least thirty yards down slope from wells, springs, streams, and other water sources.

After you have selected the site for your latrines, you must construct and maintain them. (The construction of waste disposal devices will be covered in a later lesson.) As soon as your unit moves into a new area, you must detail soldiers to dig latrines. After the latrines are dug, you must detail soldiers to clean them daily. You must ensure that the field sanitation team sprays the latrines-with insecticide as necessary. They should spray the latrine but not the contents of the pit. You must always provide handwashing devices at the latrines and make their use mandatory. You must cover, burn, or bury waste daily.

You should use your field sanitation team to train both soldiers and unit leaders in preventive medicine measures against diarrhea.

2. Heat Injuries.

As a leader, you must plan for heat conditions. Your field sanitation team can assist you in this effort by training soldiers and unit leaders in preventive medicine measures for heat injuries. If you are operating in a hot climate, you should acclimatize your soldiers to the heat as slowly as your mission allows. Before beginning operations or training, you should get the weather forecast for your area. If possible, you should train during cooler morning hours. You should schedule heavy meals in the evening rather than at noon. You must know the location of water distribution points (Figure 2-31). You must ensure adequate supplies of potable water, up to four gallons of drinking water per soldier per day, are available. In hot weather, you should issue a second canteen to each soldier. When operating in the desert, you may require more canteens. You always must ensure medical personnel are available to treat heat injuries. If you are having dispersed training, such as a road march, you must place subordinates to watch for and react to heat injuries.

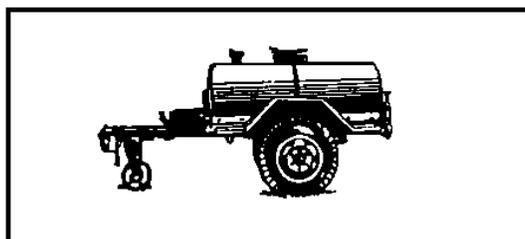


Figure 2-31. Water Distribution Point.

After you have planned for increased heat, you must obtain heat condition information per your unit's standing operating procedure (SOP). You may find the heat condition reported as a color (green, yellow, red, black), Botsball index (wet globe temperature or WGT), or wet bulb globe temperature index (WBGT). You must use heat condition information to determine required water intake and work/rest cycles (Figure 2-32). On the color scale, you must use care even when the heat condition is below green as intense physical activity could cause heat injuries. When the heat condition reaches the highest level on the scales, you should cease physical training and strenuous activity. If an operational mission requires strenuous activity, you must enforce increased water intake to minimize heat injuries. In the work/rest cycle, rest means minimal physical activity. If possible, rest should be taken in the shade. During rest periods, activities requiring only minimal physical exertion can be performed.

CRITERIA			COUNTERMEASURES	
HEAT CONDITION	BOTSBALL (WGT) INDEX°F	WBGT INDEX°F	WATER INTAKE QUARTS/HOUR	HOURLY WORK/REST CYCLE
*	BELOW 80°	BELOW 82°	1/2 (Pint)	50/10
GREEN	80° - 82°	82° - 84°	1/2 to 1	50/10
YELLOW	83° - 85°	83° - 87°	1 to 1 1/2	45/15
RED	86° - 87°	88° - 89°	1 1/2 to 2	30/40
BLACK**	88° & above	90° & above	More than 2	20/40

* MOPP gear or body armor adds at least 10°F to the WBGT Index.
 ** Suspend physical training and strenuous activity. If operational (non-training) mission requires strenuous activity, enforce water intake to minimize expected heat injuries.

Figure 2-32. Heat Condition Information.

Having planned for heat and obtained heat condition information, you must enforce individual preventive medicine measures. As a leader, it is most important that you enforce water intake (Figure 2-33). You can do this by encouraging frequent water drinking in small amounts. Then, you should observe that your soldiers drink required amounts of water. You should ensure cool

water is provided. After disinfecting water, you can add citrus fruit flavoring to enhance consumption. You must enforce water drinking before your units start any hard work. During hot weather, you should check your soldier's canteens frequently for water.



Figure 2-33. Enforce Water Intake.

Although increasing water intake is the most important preventive measure you can enforce, there are other ways to help your men avoid heat injuries. You should enforce appropriate work/rest cycles if your mission permits. If possible, you should schedule work or rest in the shade. You should encourage your men to eat all meals for needed salt. You should adjust the workload to the individual's size. Finally, if you cannot meet water and work/rest cycle goals, you must be prepared for heat casualties and decreased performance.

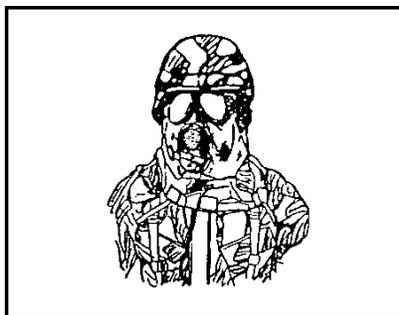


Figure 2-34. Mission-Oriented Protective Posture.

You must recognize that mission-oriented protective posture (MOPP) (Figure 2-34), body armor, and armored vehicles increase the risk of heat injuries. MOPP and body armor add 10°F to the measured wet bulb globe temperature (WBGT). For example,

you have a soldier training in MOPP with WBGT of 79°F. Without MOPP, the soldier's heat condition would be below green; but with MOPP it is red (79°F + 10°F = 89°F). If you don't remember the water intake and work/rest cycle you should enforce, you should review the earlier part of this lesson on heat condition information. Also, soldiers in armored vehicles may have heat stress; so you should increase their water intake.

Another action you can take as a leader is to direct your men to modify their uniforms in hot weather (Figure 2-35). If there is no threat of biting insects, your men should loosen their uniforms at the neck, wrists, and lower legs. However, you should ensure they keep their skin covered in the sun.



Figure 2-35. Uniform Modified for Hot Weather.

As a leader, you must be aware that some of your soldiers have special problems in the heat. You must identify these men. Then, you must modify their training or physical activity. Conditions which place soldiers at high risk from heat injuries include:

- o Diseases and injuries, especially fevers, vomiting/diarrhea, and heat rash/sunburn.
- o Recent use of alcohol (within 24 hours).
- o Overweight or physically unfit.
- o Age over 40 years old.
- o Fatigue or lack of sleep.
- o Taking medication, especially for high blood pressure, colds, or diarrhea.
- o Previous heat injury.
- o Lack of recent experience in a hot climate.

3. Cold Injuries.

As with heat, you must plan for cold conditions. Some of the same planning applies to cold weather. You should use your field sanitation team for training and obtain weather forecasts.

There also are some actions you can take specifically to prepare for cold weather. If your mission and the tactical situation permit, you should use covered vehicles for troop transport. You should ensure that your men have the proper cold weather clothing (Figure 2-36). You should have laundry services and warming tents or areas available. You must be sure hot rations and beverages and adequate drinking water are available. Before beginning training or a mission, you should inspect your soldiers. You must ensure that their cold weather clothing is available, fits properly, and is worn properly. You should also make sure that each man has at least five pairs of clean dry socks. During cold weather, you must rotate guards or others performing inactive duty frequently. Finally you must plan for medical support to treat cold weather injuries.



Figure 2-36. Cold Weather Clothing.

When operating in a cold climate, you must be able to determine and use the windchill factor. You must get the temperature and wind speed information per your unit's standard operating procedure. To calculate windchill, you find the local temperature (fahrenheit) at the top of the windchill chart (Figure 2-37). Then, you read down the column until you reach the row with the local wind speed (miles-per-hour) on the left of the chart. The point at which the temperature and wind speed cross will give you the equivalent temperature (fahrenheit). The windchill index gives the equivalent temperature of the cooling power of wind on "exposed" skin. Any movement of air, such as running, riding in open vehicles, or a

helicopter downwash, has the same effect as wind. Any dry clothing (i.e., mittens, scarves, masks, etc.) or material which reduces wind exposure will help protect the area it covers.

Wind speed (MPH)	LOCAL TEMPERATURE (°F)										
	32	23	14	5	-4	-13	-22	-21	-40	-49	-58
	EQUIVALENT TEMPERATURE (°F)										
CALM	32	23	14	5	-4	-13	-22	-31	-40	-49	-58
5	29	20	10	1	-9	-18	-28	-37	-47	-56	-65
10	18	7	-4	-15	-26	-37	-48	-59	-70	-81	-91
15	13	-1	-13	-25	-7	-49	-61	-73	-85	-97	-109
20	7	-6	-19	-32	-44	-57	-70	-83	-96	-109	-121
25	3	-10	-24	-37	-50	-64	-77	-90	-104	-117	-117
30	1	-13	-27	-41	-54	-68	-82	-97	-109	-123	-137
35	-1	-15	-29	-43	-57	-71	-85	-99	-113	-127	-142
40	-3	-17	-31	-45	-59	-74	-87	-102	-116	-131	-145
45	-3	-18	-32	-46	-61	-75	-89	-104	-118	-132	-147
50	-4	-18	-33	-47	-62	-76	-91	-105	-120	-134	-148
	LITTLE DANGER FOR PROPERLY CLOTHED PERSONS			CONSIDERABLE DANGER				VERY GREAT DANGER			
DANGER FROM FREEZING OF EXPOSED FLESH											

Figure 2-37. Windchill Chart.

Immersion syndrome (trench foot) can occur at any point on the windchill chart. Trench foot is more likely to occur than frostbite at "LITTLE DANGER" windchill temperatures. This is especially true on extended exercises or missions and/or in wet conditions. As with frostbite, trench foot can lead to a permanent disability.

At various windchill levels, there are preventive medicine countermeasures you should take to protect your men. Figure 2-38 provides countermeasures for the windchill levels from 30°F to -20°F and below.

WINDCHILL	COUNTERMEASURES
30°F and below	Alert personnel to the potential for cold injuries.
25°F and below	Leaders inspect personnel for wear of cold weather clothing. Provide warm-up tents/areas/hot beverages.
0°F and below	Leaders inspect personnel for cold injuries. Increase the frequency of guards rotation to warming areas. Discourage smoking.
-10°F and below	Initiate the buddy system—have personnel check each other for cold injuries.
-20°F and below	Modify or curtail all but mission essential field operations.

Figure 2-38. Windchill Countermeasures.

Again, as with heat conditions, you must enforce individual preventive medicine measures in cold weather. You must ensure your soldiers wear clean dry uniforms in loose layers. You should have your men remove outer clothing layers before starting work or when they are in heated areas. You should have your soldiers inspect their socks and feet (Figure 2-39) at least daily when operating in cold and/or wet conditions. You must ensure your men wash their feet daily (Figure 2-40) and wear clean dry socks. You must make sure your men use the warming areas when you make them available. You must be sure your soldiers eat all their meals and drink plenty of water and/or nonalcoholic fluids. You should ensure they exercise their big muscles or at least their toes, feet, fingers, and hands to keep warm. You must ensure that water consumption is adequate (Figure 2-41). Your men will often neglect to take in adequate fluids in cold weather. You should institute a "buddy" system in cold conditions. Soldiers taking care of each other will decrease cold injuries and combat stress.

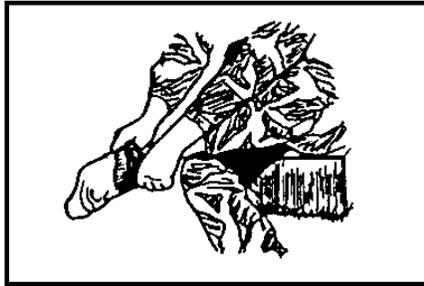


Figure 2-39. Inspect Socks and Feet Daily.

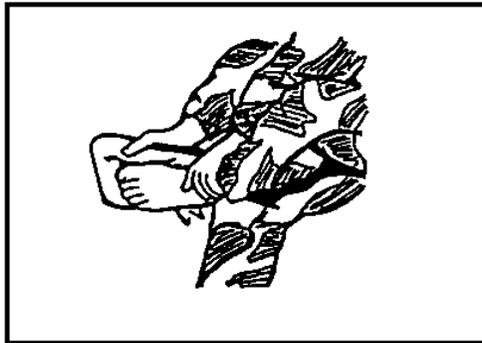


Figure 2-40. Wash Feet Daily.

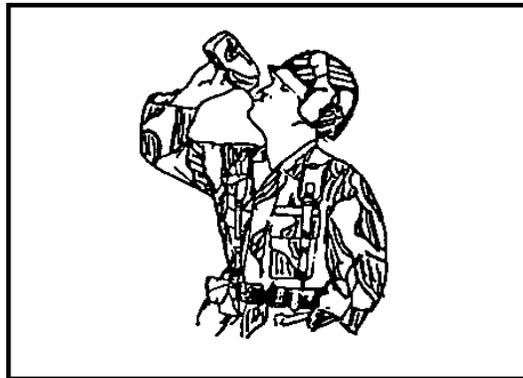


Figure 2-41. Drink Plenty of Water.

As a leader, you must identify your men who have an especially high chance of getting a cold injury. Some of these special considerations are:

- o Previous trench foot or frostbite victims.
- o Fatigue.
- o Use of alcohol.
- o Significant injuries.
- o Poor nutrition.

- o Use of medications which cause drowsiness.
- o Little previous experience in cold weather.
- o Immobilized or subject to greatly reduced activity.
- o Use of tobacco products.

Special conditions which could affect any of your soldiers are carbon monoxide poisoning and fire. You must identify carbon monoxide and fire hazards which may affect your cold weather operations.

This completes the lesson on preventive medicine countermeasures for the individual and leaders. Before you complete the practice exercise for this lesson, you should review the material contained in the lesson. For your own protection, you must be able to recognize the signs of injuries and know how to treat and prevent them. As a leader, you not only must ensure that your subordinates practice preventive medicine; but you must make plans to minimize the dangers to your unit.

LESSON TWO

Practice Exercise

The following items will test your grasp of the material covered in this lesson. There is only one correct answer for each item. When you have completed the exercise, check your answers with the answer key that follows. If you answer any item incorrectly, study again that part of the lesson which contains the portion involved.

Situation: You are a member of a unit which is taking part in an exercise in a tropical climate. Your commander has assigned you the responsibility for a group of your fellow soldiers during the exercise.

1. As web equipment and your pack reduce the ventilation your body needs to be cool, you should
 - A. not wear this equipment in hot weather.
 - B. carry these items in a truck when it is above 85°F.
 - C. remove them at rest breaks for circulation.
 - D. take turns with a "buddy" carrying this equipment.

2. When operating in a hot climate, you must drink 1/2 to 2 quarts of water an hour to replace the fluids you lose by sweating. To determine whether you are drinking enough water, you should
 - A. take your temperature at each rest break.
 - B. check the color of your urine.
 - C. keep a record of your water intake.
 - D. have a "buddy" check your amount of sweating.

3. You think a member of your unit may be suffering from heatstroke. You would
 - A. check to see if he has stopped sweating.
 - B. ask him if he has stomach cramps.
 - C. check for a tingling of his hands and feet.
 - D. ask if he has lost his appetite.

4. Because you are operating in heat conditions, you must take special care of the men for whom you are responsible. You would
 - A. arrange for medical personnel to check them at each rest break.
 - B. issue a second canteen to each man.
 - C. acclimatize your soldiers to the heat as quickly as possible.
 - D. schedule the day's heavy meal at noon.

5. You have checked for heat condition information and found it to be 88°F to 89°F on the wet bulb globe temperature index. You would
 - A. ensure your soldiers' water intake is 1 to 1-1/2 quarts per hour.
 - B. ensure your soldiers' water intake is more than 2 quarts per hour.
 - C. schedule a work/rest cycle of 45 minutes work to 15 minutes rest.
 - D. schedule a work/rest cycle of 30 minutes work to 30 minutes rest.

6. During the exercise, you have been stung by an insect; and the stinger is still in your skin. To remove the stinger, you would
 - A. dig it out with a sterilized needle.
 - B. grab the stinger by its sac and pull it out.
 - C. scrape your skin's surface with your fingernail.
 - D. have a "buddy" remove it for you.

Situation: You are a member of a unit participating in winter maneuvers in Northern Norway. Your commander has assigned you the responsibility for a group of your fellow soldiers during the exercise.

7. Your unit has been directed to construct the food preparation area. As this will involve strenuous activity, you would
 - A. remove a layer or two of clothing.
 - B. add an extra layer of clothing.
 - C. observe a work/rest cycle that does not produce sweat.
 - D. work in rotating shifts of thirty minutes each.

8. You realize that while working in the extremely cold conditions you have gotten chilblain on your hands. To treat your condition, you would
- A. warm your hands by the fire.
 - B. massage your hands.
 - C. soak your hands in cool water.
 - D. place your hands under your arms.
9. Your unit is about to operate in cold conditions. To determine the windchill factor, you must
- A. contact the battalion S-3.
 - B. know the local temperature and wind speed.
 - C. convert temperature readings from fahrenheit to celsius.
 - D. know the local temperature and relative humidity.

LESSON TWO

PRACTICE EXERCISE

ANSWER KEY AND FEEDBACK

<u>Item</u>	<u>Correct Answer and Feedback</u>
1.	<p>C. Remove them at rest breaks for circulation.</p> <p>As tight fitting clothing, web equipment, and packs reduce the ventilation your body needs to be cool, you must mitigate this condition whenever possible. By removing tight clothes and equipment, you help air to circulate around your body. This free circulation of air reduces your body temperature and decreases your risk of heat injury. (Page 16)</p>
2.	<p>B. Check the color of your urine.</p> <p>If your urine is dark yellow, you are not drinking enough water. You must increase your water intake to avoid heat injuries. (Page 18)</p>
3.	<p>A. Check to see if he has stopped sweating.</p> <p>A cessation of sweat is one of the earliest signs that a person is developing heatstroke. Treatment for heatstroke should be started immediately. (Page 20)</p>
4.	<p>B. Issue each man a second canteen.</p> <p>An adequate intake of water is the most important preventive measure for heat injuries. After issuing the extra canteens, you must ensure your soldiers fill them at every opportunity. (Page 40)</p>
5.	<p>D. Schedule a work/rest cycle of 30 minutes work to 30 minutes rest.</p> <p>At a wet bulb globe temperature index of 88°F to 89°F, you should work and rest in equal amounts. Your water intake should be 1-1/2 to 2 quarts per hour. (Page 41)</p>

Item Correct Answer and Feedback

6. C. Scrape your skin's surface with your fingernail.

By scraping your skin's surface with your fingernail or a knife, you have the best chance of removing the singer without injecting more venom into your body. (Page 33)

7. A. Remove a layer or two of clothing.

To best protect yourself in cold conditions, you should remove a layer or two of clothing when engaged in strenuous activity. When you become more inactive, you should replace your clothes. (Page 21)

8. D. Place your hands under your arms.

To treat chilblain, you rewarm the affected area by applying steady pressure. This can be done by placing that affected area under your arms or against the skin of a "buddy" under his clothing. (Page 25)

9. B. Know local temperature and wind speed.

The point at which the local temperature column intersects the wind speed row on the windchill chart gives you the equivalent temperature. (Page 44)

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LESSON THREE

UNIT FIELD SANITATION TEAM COUNTERMEASURES

OVERVIEW

LESSON DESCRIPTION:

In this lesson you will learn the unit field sanitation team concept and how it contributes to good hygiene in the field.

TERMINAL LEARNING OBJECTIVE:

- TASKS: Identify unit field sanitation team countermeasures.
- CONDITIONS: Given the subcourse material contained in this lesson.
- STANDARDS: The student will demonstrate his comprehension and knowledge of the task by identifying the field sanitation team concept, potentially hazardous foods, the field methods of disposal, and the type of latrines and shower devices.
- REFERENCE: The material contained in this lesson was derived from the following publication:
- FM 21-10/AFM 161-10.

INTRODUCTION

During the latter part of World War II, it became obvious that the medical threat from disease and nonbattle injuries was not being met. Particularly on Togatabu Island and in the jungles of Burma, disease caused severe casualties. To counter this threat at the unit level, the field sanitation team concept was developed. Selected members from each company-sized unit were designated to receive special training in disease and nonbattle injury prevention. They were then able to advise commanders of preventive medicine measures for disease and nonbattle injuries. As a result of using field sanitation teams commanders have been able to reduce losses from disease and nonbattle injuries.

1. Field Sanitation Team Concept.

The field sanitation team serves as an advisor to the Commander of a unit. They advise him on preventive medicine measures necessary to prevent diseases and nonbattle injuries. To properly assess the medical threat, team members must perform several tasks. They inspect water containers and trailers, disinfect unit water supplies, and check the water supply for chlorine. They inspect unit field food and waste disposal operations. They control insects and other animals in the unit area. They can assist in the selection of a bivouac site. They supervise the construction of all field sanitation devices

In addition to the tasks mentioned above, the field sanitation team provides prime time training to soldiers on individual preventive medicine countermeasures (Figure 3-1). They advise unit leaders on the construction and maintenance of waste disposal and personal hygiene devices. Most importantly they monitor the preventive medicine measures of the unit and advise the unit leader of needed changes.



Figure 3-1. Providing Preventive Medicine Training.

As you may either have a team assigned to your unit or be assigned as a team member yourself, you must understand how team members are selected. If the unit has organic medical personnel, such as company aidmen, these soldiers must be assigned to the field sanitation team. If medical personnel are not available, at least one member of the team must be a noncommissioned officer. Team members' normal duties must allow them sufficient time for field sanitation activities. Each soldier selected should have at least six months of duty remaining with the unit when he is appointed to the team.

The scope of field sanitation team operations matches the tasks they are required to perform. Under normal garrison conditions, the team is in a training status. When the unit goes to the field, the team performs sanitation duties. In the field, they ensure that unit leaders are supervising the disinfecting of unit water supplies. They also instruct soldiers in the methods of individual water purification. They inspect food service operations for proper hygiene practices. They monitor the construction of garbage and soakage pits and inspect for proper waste disposal. They monitor the construction of latrines and urinals and inspect for proper sanitation. They provide training in preventive medicine countermeasures under field conditions.

In garrison, team members are required to receive training in basic sanitation techniques, disease control, and individual preventive medicine measures. They must learn to use insect repellents, uniform impregnants, and protective clothing. They train to use and repair screening and bednets and to use residual and space insecticide sprays. They learn rodent control measures. Team members must know food service sanitation and water purification procedures, to include determination of chlorine residual. They must learn unit waste disposal procedures. They must know good personal hygiene practices. If their unit is about to deploy, team members must train for medical threats unique to the unit's area of operation.

Once good men have been selected for the team and they have been properly trained, they must be able to practice their skills. The team should be used during Army Training Evaluation Programs (ARTEP) and field training exercises (FTX). Team members should be tasked with providing prime time preventive medicine countermeasures training. If the unit is to deploy, the field sanitation team should provide predeployment training on the medical threat in the area in which the unit will be operating.

2. Potentially Hazardous Foods.

One of the field sanitation team's most important tasks is to inspect unit food service operations. Contaminated food is a major cause of diarrhea in the field. Potentially hazardous foods are those that support the rapid growth of disease germs that cause diarrhea. These foods include but are not limited to: meats, fish, milk, creamed beef, gravies, soups, and chicken. Extra care must be taken when preparing these foods.

There are five factors which are most often involved in outbreaks of diarrhea caused by contaminated foods. These are:

First, a failure to keep potentially hazardous food cold (below 45°F).

Second, a failure to keep potentially hazardous food hot (above 140°F).

Third, allowing potentially hazardous foods to remain at warm temperatures.

Fourth, preparing foods a day or more before serving.

Fifth, allowing sick personnel or personnel who practice poor personal hygiene to work around food.

During their inspections of food service operations both in garrison and in the field, field sanitation team members must be particularly alert to any of these five factors.

When inspecting food operations in garrison, the field sanitation team will have the supervisor check the temperature of potentially hazardous foods. Hot food should be 140°F or above, and cold food should be 45°F or below. If foods do not meet these requirements, the unit medical authority should advise the commander on the use or disposal of the food. Team members will check food handlers for illness or skin infections. They also will check food handling techniques and personal hygiene. They will ensure the supervisors check food temperature in cold storage units. They will check handwashing devices and ensure food handlers are using them. Team members will check windows and doors to ensure they are closed or screened to prevent flies from entering.

When inspecting food operations in the field, the field sanitation team begins by checking the preparation of insulated containers (Figure 3-2). For hot foods, the container should be preheated by the use of boiling water. The food should be placed in the container while it is hot (above 140°F). For cold foods, the container should be prechilled by the use of ice. Foods placed in the container should be cooler than 45°F. You should always check the container and insert seals to ensure they are intact and in good condition. These seals aid in keeping food at its required temperature. When the insulated container arrives in the field, you must check the food's temperature before serving it. If the food's temperature is not within acceptable limits, you should contact medical personnel for instructions. As a field sanitation team member or unit leader, you must ensure handwashing devices are available and that soldiers use them. Finally, you must check the mess kit laundry (Figure 3-3) to ensure soldiers are using it correctly.

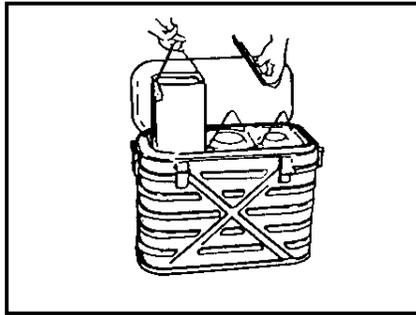


Figure 3-2. Insulated Food Container.

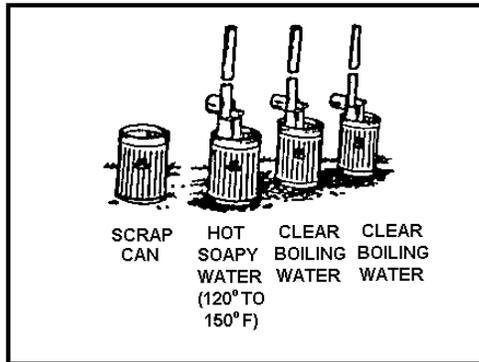


Figure 3-3. Mess Kit Laundry.

You must ensure food waste is placed in the scrap can before mess kits are washed. The mess kit should be washed by using a long handle brush to scrub it in warm soapy water (120ø to 150øF). Next, you rinse the mess kit in clear boiling water. Finally, you disinfect the mess kit by immersing it in clear boiling water for ten seconds. Each hot water setup of four cans will support 80 people. If immersion heaters are not in use, you may use food service disinfectant. If using disinfectant, you must make sure label directions are being followed. Each disinfectant setup of four cans will support 100 people.

3. Procedures for Safe Drinking Water.

The first step in ensuring safe drinking water is an inspection of water containers. If water containers are not being used, you should inspect them quarterly. Containers must also be

inspected before filling at water distribution points and prior to deployment.

In performing a quarterly inspection of your unit water trailer (Figure 3-4), you should begin by inspecting the manhole cover. You must make sure the sealing gasket is in place and free of excessive cracks or dry rot. The cover should provide an effective seal. Next, you should inspect the drain plug to make sure it is operable. It should be removable without excessive effort. You should inspect the interior of the water trailer (Figure 3-5) for excessive cracks. You also check for signs that it has been used to store products other than water, such as oil or gasoline. However, rust stains and other discolorations caused by natural chemicals in water, such as iron or manganese, pose no health problems. In inspecting the water trailer's spigots, you must make sure they are clean and operable. Covers over spigots should open and close easily. The spigot handles should operate freely.

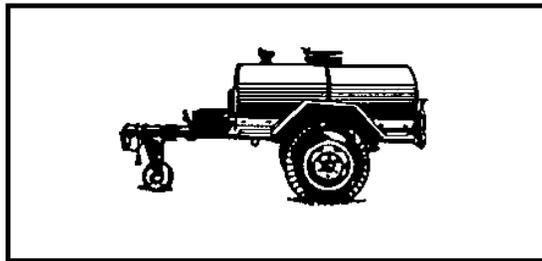


Figure 3-4. Unit Water Trailer.

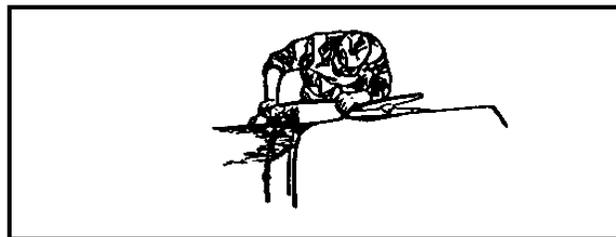


Figure 3-5. Inspect Water Trailer Interior.

When inspecting your water trailer before filling it at a water distribution point, you should check its interior for gross contamination. Next, you should check the hose to be used to fill your trailer. The water point fill hose should not come in contact with the ground. If the hose is lying on the ground, you should wash its end before using it. After you fill your trailer, you should check its manhole cover to be sure it is secure.

To inspect your lyster bags (Figure 3-6), you should check their interior for dirt or other contamination. You should check the bag for holes. You should also check the cover for holes and make sure it fits the bag. Finally, you must make sure the spigots are clean and in place.

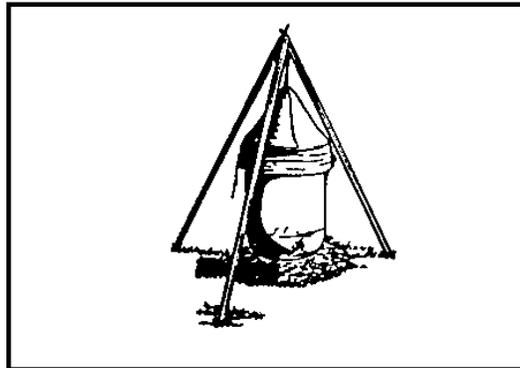


Figure 3-6. Lyster Bag.

To inspect your water cans (Figure 3-7), you should check the interior of the can for contamination. If the can has a gasoline odor, you must not use it for drinking water.

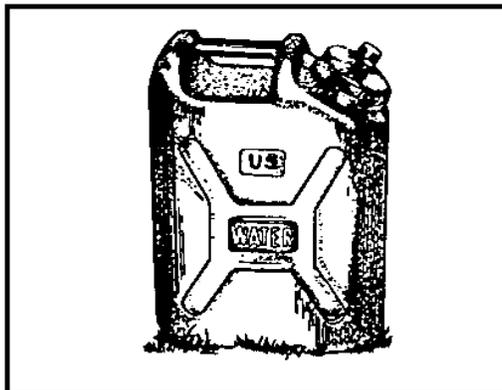


Figure 3-7. Water Can.

After inspecting and filling your water containers, you must check your unit water supply for chlorine residual. You must do this when you fill the container at a water distribution point. You must also check when water containers arrive in your unit area, or you are directed to do so by medical authorities. You must always check the chlorine residual when treating a raw water supply.

The first step in checking the chlorine residual is to determine the desired chlorine residual in parts per million (ppm). Supplies of water from a water distribution point

should have at least 1 ppm chlorine residual. When your unit must disinfect a raw water supply, there should be 5 or 10 ppm chlorine residual as directed by medical authority in the disinfected water. To test for chlorine residual, you select the desired color comparison tube (Figure 3-8). The tubes are marked 1, 5, or 10 to correspond to your desired chlorine residual in ppm. You place one test tablet in the color comparison tube cap and crush it with the bottom of the test tablet bottle (Figure 3-9). Then, you put the crushed tablet into the color comparison tube. You should flush the spigot of the water container being checked. Then, you fill that tube to a point just below the color band (Figure 3-10).

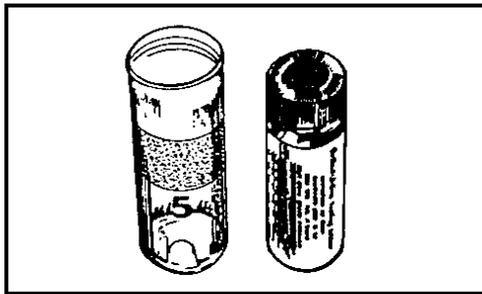


Figure 3-8. Color Comparison Tube and Tablets.

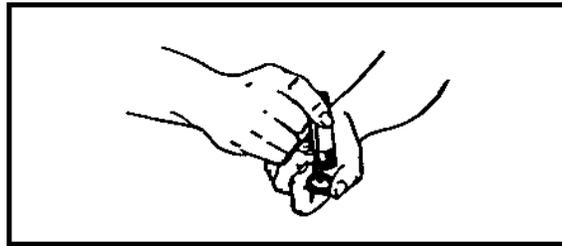


Figure 3-9. Crush the Test Tablet.

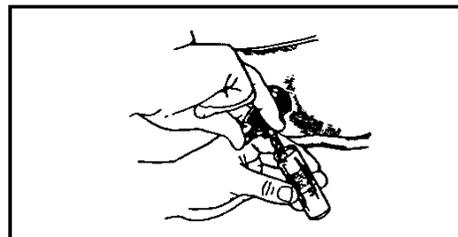


Figure 3-10. Fill the Color Comparison Tube.

You place the cap on the color comparison tube and shake it until the test tablet is completely dissolved. Finally, you compare the color shade of the water with the color band on the tube (Figure 3-11). If the water is the same shade or darker than the color band on the tube, the water is safe to use. If the water color is lighter than the band on the tube, you must chlorinate your water supply.

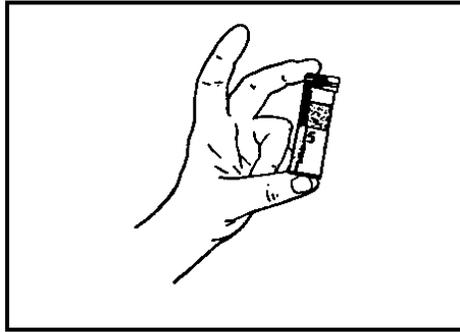


Figure 3-11. Compare the Colors.

You should chlorinate your water supply when the water supply has no chlorine residual, the chlorine residual is below the required level, or a raw or untreated water supply must be used. If the chlorine residual is less than the required level, you must add enough chlorine to raise the residual to 5 ppm. After adding the chlorine, you should wait ten minutes then check the chlorine residual again. If the residual is less than 5 ppm, you should add another smaller amount of chlorine and wait another ten minutes. When the chlorine residual is at least 5 ppm, you should wait an additional twenty minutes before drinking the water.

As the drinking of "untreated water" is such a significant cause of diarrhea and dysentery, you must have a comprehensive knowledge of water purification procedures. You must be able to determine whether water needs treatment and how to treat it if it does not meet purification requirements. This section has dealt with purifying a unit's water supply. Before continuing with the rest of this lesson, you should also review the individual methods of purifying water contained in Lesson One.

4. Field Methods of Waste Disposal.

This section will deal with the disposal of waste in the field, except for human waste which will be the subject of the next section.

You may dispose of garbage and rubbish by burial or burning. For short stays in an area, you should bury and cover garbage daily. If you are bivouacked for a longer period, rubbish may have to be burned. However, after burning, you should bury the ashes. Generally, you should use a garbage pit (Figure 3-12) to prevent an accumulation of rubbish in the unit area. In constructing a garbage pit, you should locate it near the dining facility but no closer than thirty yards. You should dig one pit for each 100 soldiers to be served each day. The size of the pit is determined by the length of your stay in the area. The waste should be covered with dirt after each meal. You should spray the area regularly with insecticide to control flies. You should close out the garbage pit when it is filled to within one foot of the ground surface. To close out the garbage pit, you should spray with residual insecticide. You should pack the earth in successive three inch layers until it is mounded one foot above ground level. Then, you spray again with residual insecticide. Finally, unless you are in combat, you should post a sign saying "closed garbage pit" and the date.

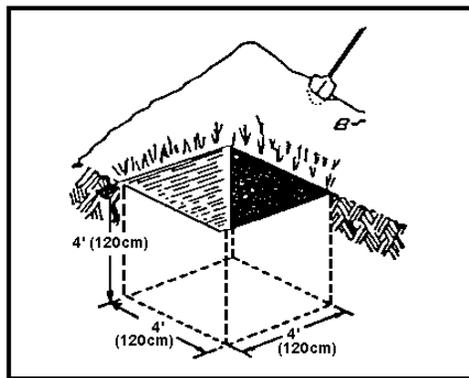


Figure 3-12. Garbage Pit.

You may be required to construct two types of soakage pits or trenches. Both types are used to prevent the accumulation of liquid waste.

The first type of soakage pit/trench is for kitchen waste disposal (Figure 3-13). These pits/trenches are located near the dining facility and filled with loose rocks. The size of the pit/trench is determined by the length of your stay in the area. With a soakage pit/trench for kitchen waste, you should construct a grease trap (Figure 3-14) to prevent clogging of the soil.

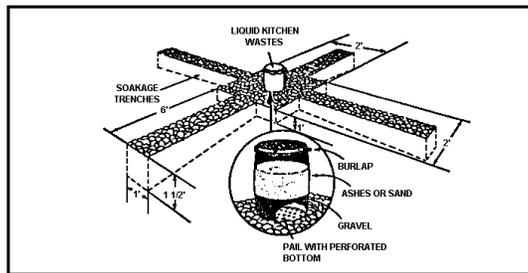


Figure 3-13. Soakage Trenches for Liquid Kitchen Wastes.

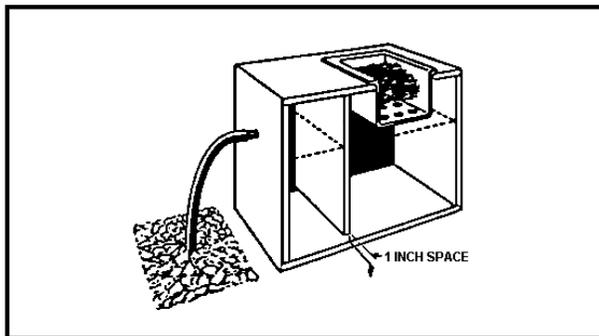


Figure 3-14. Grease Trap.

The other type of soakage pit/trench (Figure 3-15) is for use with urinals, showers, lyster bags, or any other location where water collects. Like the soakage pit/trench for kitchen waste, it is filled with loose rocks.

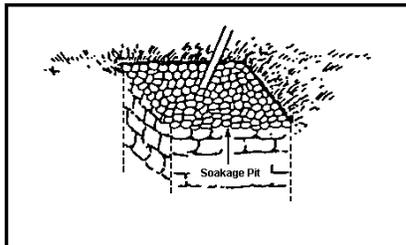


Figure 3-15. Soakage Pit.

5. Latrines and Urinals.

You must construct latrines and urinals for the disposal of human waste.

The simplest form of latrine is a cat-hole latrine (Figure 3-16). The cat-hole latrine is used by the individual soldier while on a march and should be filled in immediately after use. It is merely a hole twelve inches wide and six to twelve inches deep.

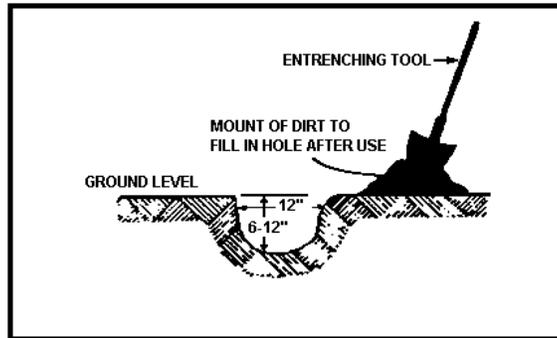


Figure 3-16. Cat-hole Latrine.

For a short bivouac, you should construct a straddle trench latrine (Figure 3-17). A straddle trench latrine is four feet long by one foot wide by two feet six inches deep. You should leave two feet between trenches. You should construct four trenches per 100 males and six trenches per 100 females.

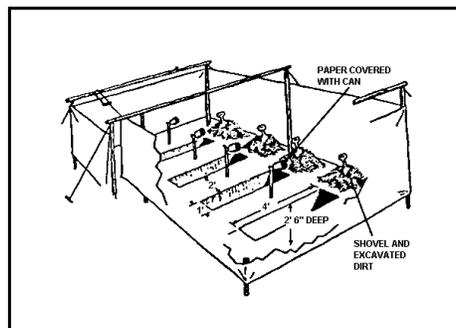


Figure 3-17. Straddle Trench Latrines.

For an extended bivouac, you should construct a deep pit latrine (Figure 3-18). The deep pit latrine is seven-feet six inches long, two feet wide, and six feet deep. Collapsible two-seat boxes are available in the supply system to use with

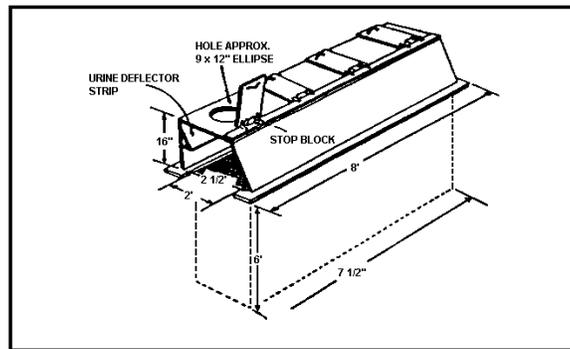


Figure 3-18. Deep Pit Latrine.

the deep pit latrine. These boxes are eight feet long, two feet six inches wide, and sixteen inches high. Each box has two holes approximately nine by twelve inches.

If the ground is too hard for digging or the water table is too high, you should construct either a pail-latrines (Figure 3-19) or a burn-out latrine.

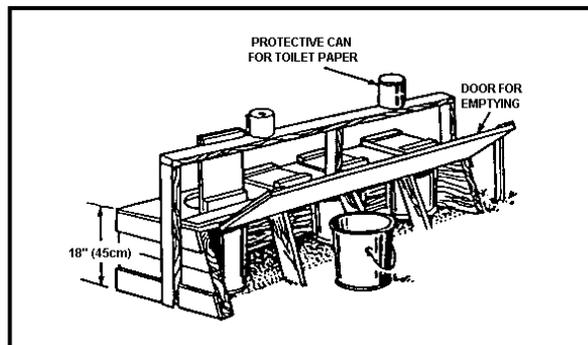


Figure 3-19. Pail-latrines.

In maintaining latrines, the field sanitation team must spray the facilities, not the pit contents, with insecticide when flies or other insects are a problem. You should cover the waste in straddle trench latrines daily. You must empty and clean pail-latrines daily. You must rotate and burn the contents of burn-out latrines daily.

As with garbage pits, you must close latrines when they are filled to within one foot of the ground surface. To close, you spray the latrine with residual insecticide. You pack the

earth in successive three-inch layers until it is mounded one foot above ground level. Then, you spray again with residual insecticide. Finally, you post a sign stating "closed latrine" and the date.

At male latrines, you must also construct urinals. There are three types of urinals that you can construct. The first and simplest is a trough urinal (Figure 3-20). This is a ten foot long trough which drains into a soakage pit.

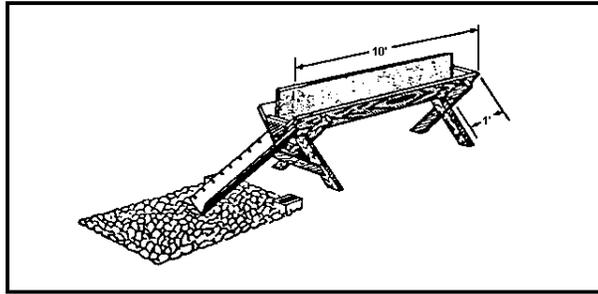


Figure 3-20. Trough Urinal.

The second type of urinal is a pipe urinal (Figure 3-21).

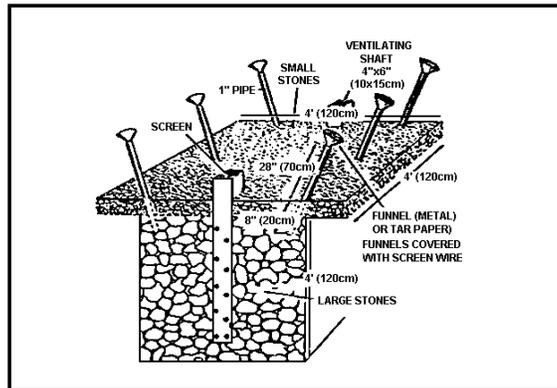


Figure 3-21. Pipe Urinal.

The final type of urinal is the "urinoil" (Figure 3-22).

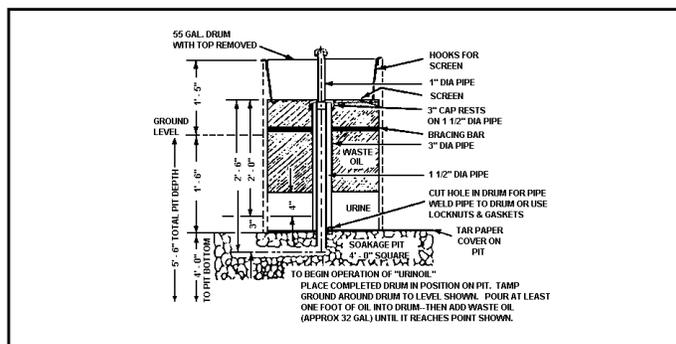


Figure 3-22. Urinoil.

6. Handwashing and Shower Devices.

Handwashing and shower devices are important for maintaining good personal hygiene in the field. You must collocate handwashing devices (Figure 3-23) at food service areas and latrine locations. In the unit bivouac area, you should construct both handwashing and shower devices (Figure 3-24). For both handwashing and shower devices, you must provide a soakage pit. To maintain these facilities, you must ensure an adequate supply of soap and water is available.

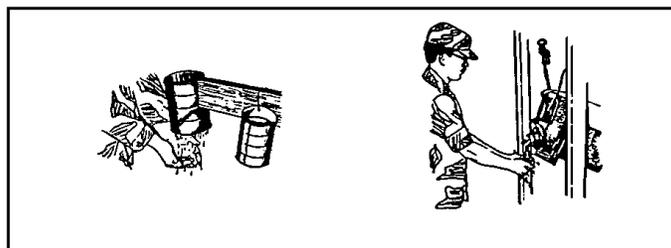


Figure 3-23. Handwashing Devices.

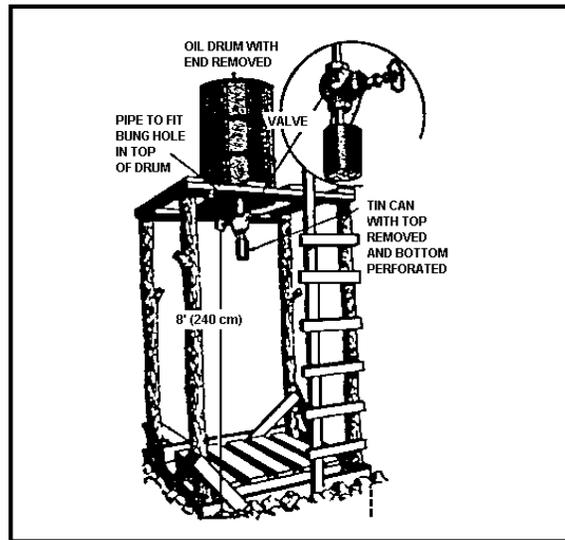


Figure 3-24. Shower Device.

This completes this lesson on unit field sanitation team countermeasures. Before you complete the practice exercise for this lesson, you should review the material contained in the lesson. As a member of an infantry unit, you will come into contact with the field sanitation team. You may even be a member of the team or in charge of the team. You must be aware of what the team is doing because their primary purpose is to help you and the other members of your unit avoid disease and other nonbattle injuries.

LESSON THREE

Practice Exercise

The following items will test your knowledge of the material covered in this lesson. There is only one correct answer for each item. When you have completed the exercise, check your answers with the answer key that follows. If you answer any item incorrectly, study again that part of the lesson which contains the portion involved.

Situation: You are a member of an infantry unit and must work your unit's field sanitation team to prevent disease and nonbattle related injuries.

1. In order to be assigned to a field sanitation team, a soldier must
 - A. have extensive training in sanitation principles and practices.
 - B. be a noncommissioned officer.
 - C. be a company aidman.
 - D. have six months of duty remaining with the unit.
2. Field sanitation team members
 - A. learn to treat battle casualties.
 - B. train medical personnel in unit sanitation.
 - C. inspect food service operations.
 - D. must know CPR.
3. In inspecting food operations in garrison, you would
 - A. check food delivered by civilian vendors for freshness.
 - B. ensure supervisors check food temperature in cold storage units.
 - C. ensure daily menus provide for a well balanced diet.
 - D. notify medical personnel if you find spoiled food.
4. In inspecting your unit's water trailer, you would
 - A. make sure there are no rust stains on the interior.
 - B. have the trailer cleaned if it has been used to store oil.
 - C. check that spigot handles operate freely.
 - D. check the interior for traces of manganese which could cause health problems.

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5. You unit is camped by a mountain stream and no "treated water" is available. Before using the raw water supply, you would
 - A. disinfect the water to a chlorine residual of five parts per million.
 - B. not worry because the water is clear and swift running.
 - C. get medical personnel to test the stream water.
 - D. get permission from your unit commander to drink the water.

6. To construct a soakage pit for liquid kitchen waste, you must
 - A. locate it well away from your dining facility.
 - B. construct a grease trap to prevent clogging the soil.
 - C. construct handwashing devices by the soakage pit.
 - D. locate it immediately adjacent to your garbage pit.

7. During an exercise, your unit is bivouacked in an area where the ground is too hard for digging. To provide for the disposal of human waste, you would
 - A. arrange for waste disposal with a vendor from a nearby town.
 - B. request permission from your unit commander to move to a new bivouac site.
 - C. have the soldiers in your unit use cat-hole latrines.
 - D. construct a pail-latrine.

8. To maintain handwashing and shower devices, you must
 - A. provide adequate soap and water.
 - B. ensure the soakage pit is not saturated.
 - C. check for insect infestation, particularly mosquitoes.
 - D. check wooden stands for wet rot.

LESSON THREE

PRACTICE EXERCISE

ANSWER KEY AND FEEDBACK

"Item" "Correct Answer and Feedback"

1. D. Have six months of duty remaining with the unit.

Because of the training involved for a field sanitation team member, a soldier must have at least six months remaining on his tour of duty with the unit. If he has less than six months, the unit will not realize any benefit from training him. (Page 56)

2. C. Inspect food service operations.

One of the unit field sanitation team's most important functions is to ensure that food is prepared correctly and under-hygienic conditions. (Page 57)

3. B. Ensure supervisors check food temperature in cold storage units.

A major cause of disease from potentially hazardous foods is improper temperature. Hot foods must be maintained over 140°F, and cold foods must be maintained below 45°F. (Page 58)

4. C. Check that spigot handles operate freely.

Both spigot covers and handles on unit water trailers must operate freely to give soldiers easy access to "treated water." (Page 60)

5. A. Disinfect the water to a chlorine residual of five parts per million.

When disinfecting a raw water supply for your unit's use, medical authorities will direct a chlorine residual of either five or ten parts per million. (Page 62)

"Item" "Correct Answer and Feedback"

6. B. Construct a grease trap to prevent clogging the soil.

Soakage pits constructed for the disposal of liquid kitchen waste must include a grease trap. The grease created by cooling will not be absorbed by the ground and must be filtered out before the waste enters the soakage pit. (Page 64)

7. D. Construct a pail-latrine.

Pail-latrines and burn-out latrines should be used when the ground is too hard for digging or the water table is high. (Page 67)

8. A. Provide adequate soap and water.

Without an adequate supply of soap and water, handwashing and shower devices cannot help prevent infections and skin disease. (Page 69)

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