



HANDBOOK

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Field Sanitation in Contingency Operations

Tactics, Techniques, and Procedures

Center for Army Lessons Learned (CALL)
Fort Leavenworth, KS 66027-1350

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Foreword

In every armed conflict more soldiers become mission incapable by disease and non-battle injury (DNBI) than by combat-inflicted wounds. Many of this DNBI are totally preventable or can be mitigated if standards are enforced and implemented.

This handbook is a one-stop shop for doctrinal references; tactics, techniques, and procedures (TTP); and lessons learned relating to preventive medicine, field hygiene, and field sanitation for individuals, supervisors, and leaders in Operation IRAQI FREEDOM (OIF) and other recent operations. This handbook is a quick reference guide for Soldiers in the field and, though it borrows heavily from **FM 4-25.12, *Unit Field Sanitation Team*** and **FM 21-10, *Field Hygiene and Sanitation***, is not meant as a substitute for these or any other field manuals (FMs), technical manuals (TMs), or Army regulations (ARs). This handbook is also not a replacement for advice from medical personnel, preventive medicine personnel, and unit field sanitation personnel deployed in theater. These personnel are available at every level of command and should be viewed as a combat multiplier.

This handbook focuses on many of the key field sanitation and preventive medicine issues facing our troops currently deployed in the Central Command (CENTCOM) area of operation (AO) including OIF and Operation ENDURING FREEDOM (OEF). The purpose of this handbook is to support those Soldiers currently deployed and those due to deploy in the future. Force protection is everyone's business. A healthy force is a protected force. The information contained in these pages is useful to all service members, regardless of rank.



LAWRENCE H. SAUL

COL, FA

Director, Center for Army Lessons Learned

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The book is organized into four chapters. The first chapter focuses on personal preventive measures and field sanitation at the individual Soldier level. The second chapter focuses on collective field sanitation at the platoon and company level. The third chapter focuses on the responsibility of company- and battalion-level leaders to ensure preventive medicine and field sanitation is being trained and practiced in theater. The final chapter contains a listing of the resources used to compile this handbook along with a list the acronyms and abbreviations.

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Unless otherwise stated, whenever the masculine or feminine gender is used, both are intended.

Note: Any publications referenced in this newsletter (other than the CALL newsletters), such as ARs, FMs, and TMs must be obtained through your pinpoint distribution system.

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INTRODUCTION

BACKGROUND

FM 21-10, *Field Hygiene and Sanitation* defines a disease and non-battle injury (DNBI) casualty as “a military person who is lost to an organization by reason of disease or injury, and who is not a battle casualty.” The purpose of this guide is to provide the Soldier with the proper knowledge, techniques, and preventive measures to reduce the number of DNBI casualties in the Southwest Asia theater of operation. DNBI has consistently been the greatest casualty producer in the U.S. Army in past conflicts and these DNBI numbers have not included the vast numbers of personnel who continue to operate at a diminished capacity while affected by unreported disease or injury. For the squad leader this means potentially fewer Soldiers in his squad available for missions. This echoes up through the ranks all the way to the division and corps commanders. Combat power is directly affected by good or bad preventive medicine measures (PMM) at the individual, collective, and leader level. Good or bad preventive medicine is a function of discipline and leadership.

WHAT IS IN THIS GUIDE?

This handbook is meant to be a one-stop shop for individuals, supervisors, and leaders on preventive medicine, field hygiene, and field sanitation doctrinal references, TTP, and lessons learned in Operation IRAQI FREEDOM (OIF) and other recent operations. This handbook is a quick reference guide for Soldiers in the field and, though it borrows heavily from FM 4-25.12 and FM 21-10, is not meant as a substitution for these or any other field manuals (FMs), technical manuals (TMs), or Army regulations (ARs). This guide is also not meant to replace advice from medical personnel, preventive medicine personnel, and unit field sanitation personnel deployed in theater. These personnel are available at every level of command and should be viewed as a combat multiplier. When their guidance is heeded, more troops are available to commanders for the mission.

WHY THIS HANDBOOK WAS DEVELOPED?

Throughout history DNBI resulting from medical threats (including, but not limited to, heat, cold, and disease) have accounted for more losses to fighting forces than combat-related injuries. Even prominent military personalities, such as Alexander, Hannibal, Frederick, and Napoleon suffered setbacks due to loss of forces as a result of DNBI. Despite considerable advances in the technology of war, the medical threat still presents a significant danger to our forces. For example:

- Operation JUST CAUSE, Republic of Panama, 1989. Many U.S. personnel suffered heat prostration/injuries due to a lack of acclimatization and a shortage of drinking water. Airborne personnel jumped into the mangrove swamps around Panama City without adequate amounts of water to drink. Each individual had only one canteen of water. The water in these swamps is brackish (salt) water; therefore, the personnel could not refill their canteens and treat the water with iodine tablets. Unit combat lifesavers cut off the tops of 500 cubic centimeter (cc) IV solution bags and had the individuals drink the solution to relieve the heat effects.
- Operation DESERT SHIELD/DESERT STORM in Saudi Arabia, 1990-1991. At ports and other large troop concentration areas, sanitation safeguards were nonexistent or poorly controlled. Soldiers often had to pass through areas where human waste was leaking from outdoor latrines positioned too close to shower facilities. These

conditions, along with other sanitation problems, contributed to many cases of shigella (a diarrheal disease).

- Operation RESTORE HOPE in Somalia, 1993-1994. In the process of upgrading and moving a unit to a new location, a U.S. unit selected an area that had been occupied by a coalition force. They assumed that because the coalition forces had found the area suitable it would also accommodate the unit's Soldiers. After expending considerable time and resources on constructing facilities in the area, the unit contacted the surgeon to assist in dealing with a fly problem. When the preventive medicine team arrived, they quickly discovered that the source of the flies was a raw sewage dump adjacent to the site. The unit had to relocate.
- Haiti. U.S. personnel did not employ personal protective measures against arthropod-borne diseases. They failed to correctly use the insect repellent, permethrin, and bed nets. Failure to use these protective measures contributed to a dengue fever rate of over 30 percent among Soldiers hospitalized with fever.

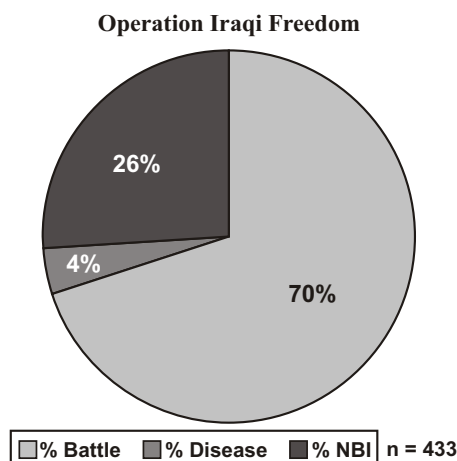


Figure 1: Deaths

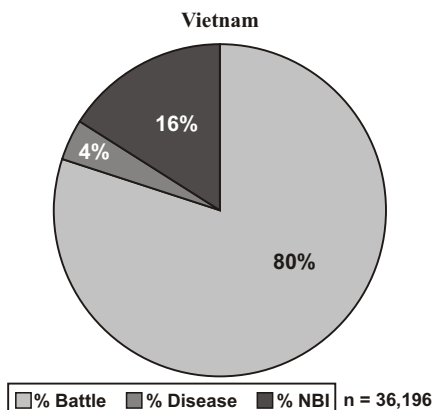


Figure 2: Deaths

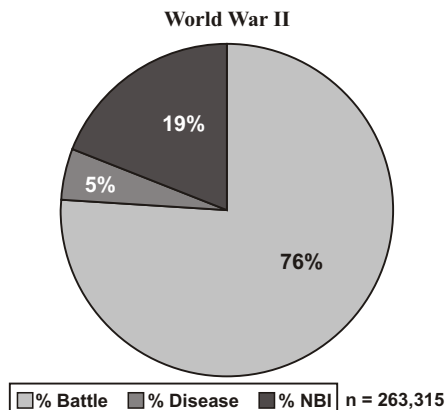


Figure 3: Deaths

DEATH RATES BY CONFLICT

The above charts, provided by U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), illustrate that the percentage of DNBI deaths has actually increased from previous major operations. The numbers are almost as startling for nonfatal injuries. In OIF from 19 March 03 to 30 Apr 04, 6,475 Soldiers were evacuated; 3,773 were evacuated for non-battle injuries and 1,182 were wounded-in-action (WIA). (**Note:** AMEDD numbers for WIAs may be low because those evacuated from theater represent only a portion of those who are wounded in action. Most WIAs are treated in theater.) DNBI deaths and nonfatal injuries total 10,000 Soldiers not available for duty today in Iraq.

Chapter 1: Individual Prevention (Soldier/Squad Level)

In all deployments, preventive medicine starts with the individual Soldier. No one else can better protect you from illness, injury, or death. Preventive medicine measures (PMM) at the individual level defends against the majority of illnesses that are most prevalent in Iraq today.

Preventive medicine steps are easy, simple, and uncomplicated. Following them will help you to better accomplish your mission and return home safely from this deployment.

MEDICAL THREATS

The main medical threats to you during any deployment are:

- Heat
- Cold
- Bugs and animals
- Food/water contamination
- Toxic industrial chemicals/materials
- Noise
- Non-battle injury
- Lack of individual physical fitness

PRINCIPLES OF PMM

With these threats in mind the Army has three principles of PMM:

- Soldiers performing individual PMM.
- Unit field sanitation training, individual PMM, and implementing collective PMM.
- Leaders, at all levels, supervising and enforcing PMM at the individual and collective level.

In this first chapter we will focus on individual PMM. Every Soldier, regardless of rank or location, needs to understand and apply these simple measures. Maintaining this discipline will prevent injury and the spread of disease throughout the force.

SECTION A: PERSONAL HYGIENE

HAND WASHING

The simplest thing Soldiers can do to protect themselves from the spread of disease is to wash their hands frequently. Washing your hands denies diseases an easy entry point into your body. If you do not wash your hands frequently, you pick up germs from other sources and infect yourself when you touch your eyes, your nose, or your mouth. One of the most common ways people catch colds is by rubbing their nose or their eyes after their hands have been contaminated with various viruses that cause colds.

You can also spread germs directly to others or onto surfaces that other people touch and before you know it, everybody around you is getting sick. The important thing to remember is that, in addition to colds, serious diseases like infectious diarrhea and meningitis can easily be prevented if people make a habit of washing their hands.

When to clean (at a minimum):

- After using the latrine
- Before eating or snacking
- After eating or snacking
- After handling anything that could potentially transfer germs
- After physical contact with any local nationals*

*(**Note:** Maintain your cultural awareness and ensure that no cultural insult is conveyed when you do this.)

How to clean (techniques):

- Use hand sanitizing solutions.
- Always utilize hand-washing stations with soap when available.
- Use drinking water with soap if available.
- Use the alcohol wipe included in every meal ready-to-eat (MRE) to clean your hands.
- Use commercial baby wipes or other hand wipes if available.
- If you do not have drinking water, as a last resort, wash with non potable water*

*(**Note:** Use non potable water only as a last resort as it could be contaminated, therefore decreasing the positive effect of hand washing.)

Hand washing is the single most important individual protective measure a Soldier can take to prevent the spread of disease.

WHAT TO EAT AND DRINK

Where you eat and drink is almost as important as what you eat and drink. First and foremost, only eat and drink from approved sources. Prepackaged military rations (MREs, T-rations) and military dining facilities (either run by military personnel or contractors) are your primary approved sources. Army and Air Force Exchange Service (AAFES)-run facilities are an approved source as well. Your local preventive medicine detachment or health care professional can provide you with information about other approved sources in your local area. Unless a vendor is approved by a U.S. Army veterinary detachment, you are not authorized to eat or drink from that source.

Food-borne and water-borne diseases are caused by eating food or drinking water that contains the bacteria, parasites, or viruses that cause certain diseases. Sanitation is poor throughout Southwest Asia, even in major urban areas. Local food and water sources (including ice) can be heavily contaminated. Diarrheal diseases can be expected to affect a very large number of personnel within days if local food, water, or ice is consumed.

The most commonly recognized food-borne infections are those caused by the bacteria *Campylobacter*, *Salmonella*, and *E. coli* and by a group of viruses called calicivirus, also known as the Norwalk and Norwalk-like viruses.

- *Campylobacter* is a bacterial pathogen that causes fever, diarrhea, and abdominal cramps. It is the most commonly identified bacterial cause of 5 to 14 percent of the diarrheal illness in the world. *Campylobacter* bacteria is found in most animals and is most frequently found in raw poultry.
- *Salmonella* is also a bacterium that is widespread in domestic and wild animals. It can spread to humans via a variety of different foods of animal origin. The illness it causes, salmonellosis, typically includes fever, diarrhea, and abdominal cramps.
- *E. coli* is a bacterial pathogen that has a reservoir in cattle and other similar animals. Human illness typically follows consumption of food or water that has been contaminated with microscopic amounts of cow feces. The illness it causes is often a severe and bloody diarrhea and painful abdominal cramps, without much fever.
- Calicivirus or Norwalk-like virus is an extremely common cause of food-borne illness, though it is rarely diagnosed. It causes an acute gastrointestinal illness, usually with more vomiting than diarrhea, that resolves itself within two days. Unlike many food-borne pathogens, it is believed that Norwalk-like viruses spread primarily from one infected person to another. Infected kitchen workers can contaminate the food as they prepare it.

PREVENTION

Assume all non-approved food, ice, and water is contaminated. You should not drink local tap water, fountain drinks, or use ice cubes. Do not eat any food or drink any water or beverage (including bottled water) that has not been approved by the U.S. military, as these may be contaminated. Even a one-time consumption of this food or water may cause severe illness.

Even though there are vaccines for hepatitis A and typhoid fever, they are not 100 percent effective so you should not consume unapproved food or water.

If local ice is used to cool beverages or bottled water, the bottles or cans should be wiped clean prior to consuming the drink to avoid possible contamination.

Infectious diarrhea results from contamination of water and food by bacteria, viruses, and parasites. Water- and food-borne diarrheal diseases are of particular concern to the military because they can be spread to large numbers of service members simultaneously with disastrous consequences for combat readiness. Parasites (amoebas, *Giardia*, and tapeworms) consumed in water or undercooked food, especially meat and fish, can cause prolonged illness. Diarrhea, especially when vomiting or fever is present, can cause dehydration.

While many Soldiers in Iraq see the impact on morale of local purchase food as outweighing the risks of food-borne illness, this prohibition should not to be taken lightly. Several severe outbreaks of food-borne illness were reported in Iraq after Soldiers consumed local food and beverages (even bottled and canned drinks could be contaminated, though canned products are less likely to be as contaminated as bottled.)

In certain situations, military personnel are required to participate in meals with local nationals for civil affairs purposes. When these situations are directed by the chain of command, it is recommended you seek the advice of preventive medicine personnel or a health care professional prior to the event. They can advise you as to which foods and beverages to avoid and which are the safest to consume. They can also advise you of any preventive measure you can undertake prior to the event. The following are general guidelines for eating on the economy (when approved by your chain of command):

- Avoid high-risk foods (fresh eggs, unpasteurized dairy products, fruits/vegetables grown on the ground, uncooked vegetables, raw or undercooked meats) unless from approved sources.
- If non-approved foods must be consumed, choose low risk foods like baked goods (bread), fruit grown on trees with thick peels (washed with safe water, remove peel prior to eating), or boiled food (rice, vegetables).
- Avoid food served from communal dishes when possible, especially when hands are used to serve from these dishes.

CLEANLINESS

In garrison, Soldiers readily conduct daily personal hygiene. Routine acts of personal hygiene are performed in a conveniently located latrine that is warm and has hot and cold water. However, in the field an ordinarily well-groomed individual may become dirty and unkempt. Filth and disease go hand in hand. Dirty, sweaty socks may cause the feet to be more susceptible to disease. Dirty clothing worn for prolonged periods of time and unwashed hair are open invitations to lice. Inadequate personal hygiene in the field is one of the most difficult problems to overcome because it requires a sense of responsibility on the part of each individual to try to maintain personal hygiene regardless of difficulties encountered.

When preparing to deploy, all service members need to pack a two month's supply of standard toiletry articles including but not limited to the following:

- Soap
- Shampoo
- Wash cloths
- Towels

- Toothbrush
- Dental floss
- Fluoride toothpaste
- Talcum powder
- Foot powder
- Antiperspirant/deodorant
- Baby wipes
- Hand sanitizing solution
- Shaving kit
- Feminine hygiene products

(**Note:** Do not share your toiletry articles with others as this may spread disease and infections.)

Bathe frequently; if showers are not available, use a washcloth daily to wash:

- Your genital area
- Your armpits
- Your feet
- Other areas where you sweat or that become wet, such as between thighs or buttocks and for females, under the breasts

Keep skin dry:

- Use foot powder on your feet, especially if you have had fungal infections on your feet in the past.
- Use talcum powder in areas where wetness is a problem (such as between the thighs, and for females, under the breasts).
- Wear proper clothing.
- Wear loose fitting uniforms; they allow for better ventilation. Tight fitting uniforms reduce blood circulation and ventilation.
- Do not wear nylon or silk-type undergarments in hot or humid environments.

FITNESS

Soldiers are normally expected to maintain their personnel fitness during garrison operations, but fitness is often neglected while on deployment. The Army Physical Fitness Tests (APFTs) are often not required and units seldom do collective physical training (PT) while deployed (due to shift work, force protection, and physical separation of the unit). While it is difficult, it is critical that you maintain your physical conditioning while deployed. Individual physical fitness plays a large part in your ability to fight off infections and diseases. It also plays a part in preventing physical injuries. The bottom line is that physically fit service members are less likely to get sick or injured.

Some military occupational specialty (MOS) duties while deployed involve activities that will maintain fitness levels, but many MOS duties do not. Every Soldier can benefit from some form of fitness activity. Do not wait until you are deployed in theater to begin a fitness program. Physical fitness should be a unit program prior to deployment. Actively participating in a unit physical fitness program assists the unit in becoming acclimatized once in the field environment. Once deployed, fitness activities also lower the likelihood of combat operational stress reaction (COSR). Leaders must be aware of the morale benefits of physical training opportunities and should consider deploying with some unit physical fitness equipment or sports equipment. PT also helps greatly with acclimatization.

(Note: Use caution when exercising in extremely hot or cold weather; heat/cold injuries can occur. Be aware that some contact sports may produce more injuries than benefits. Force protection considerations also need to be considered when developing a unit physical fitness program in theater (do not conduct unit runs at the same time, in the same place, each day).

SLEEP

Sleep sustains performance, and performance is critical to a successful outcome across the full spectrum of operations. Less than adequate sleep will degrade operational performance and can lead to errors, accidents, and friendly fire incidents.

Seven to eight hours of sleep in each 24 hours will sustain performance indefinitely. Sleep does not need to be taken all at one time, but can be divided into 2 or more sleep periods (including naps) as long as the total sleep in 24 hours is 7 hours or greater.

Naps add to recuperative sleep time. A nap boosts both immediate and long term performance. The benefits of even a short nap is evident for up to 2 days after the nap.

Performance will be degraded with less than 7 hours of sleep every 24 hours. Less than 7 hours of sleep within every 24-hour period will result in stabilizing performance at a lower level, and less than 4 hours of sleep in every 24 hours will degrade performance continuously and rapidly with no stabilization.

To the extent possible, sleep in a quiet, undisturbed environment away from other activity and protected from “wake up and wait” intrusions. Sleep taken in a noisy, active environment with frequent awakenings is less restorative.

When working on limited or no sleep, caffeine in doses of 200 to 300 milligrams (the equivalent of 2-3 cups of coffee) every 3-4 hours will improve performance.

Sleep, like fuel, ammunition, food, and water is necessary to sustain operational performance. It is a command responsibility to ensure all personnel get adequate restorative sleep.

Sustaining operational performance requires adequate sleep. Take every opportunity to sleep. When operational conditions permit, take short naps in coordination with other team members. Ensure that adequate numbers of personnel are awake for force protection missions at any given time. “Nap early, nap often.”

DOD INSECT REPELLENT SYSTEM

The best strategy for defense against insects and other disease-bearing arthropods is the use of the DOD Insect Repellent System. This system includes the application of extended duration 33 % DEET repellent to exposed skin, the application of permethrin to the field uniform, and a properly worn uniform.

- Standard military skin repellent: 33% DEET (NSN 6840-01-284-3982), long-acting formulation, one application lasts up to 12 hours
- Standard military clothing repellents, either: aerosol spray, 0.5% permethrin (NSN 6840-01-278-1336), one application lasts through 5-6 washes; or impregnation kit, 40% permethrin (NSN 6840-01-345-0237), one application lasts the life of the uniform
- Proper wear of the desert combat uniform (DCU) that provides a physical barrier to insects

(Note: The DOD Insect Repellent System is a concept that brings the three components discussed above into a unified approach to protection. Without implementing the DOD Insect Repellent System concept, the use of the three components independently will provide inferior protection.)

When used, the DOD Insect Repellent System can provide nearly complete protection from arthropod-borne disease. Despite these precautions you may still receive bites. This does not mean that the DoD Insect Repellent System is not working. Some insects will respond differently than others.

How to apply

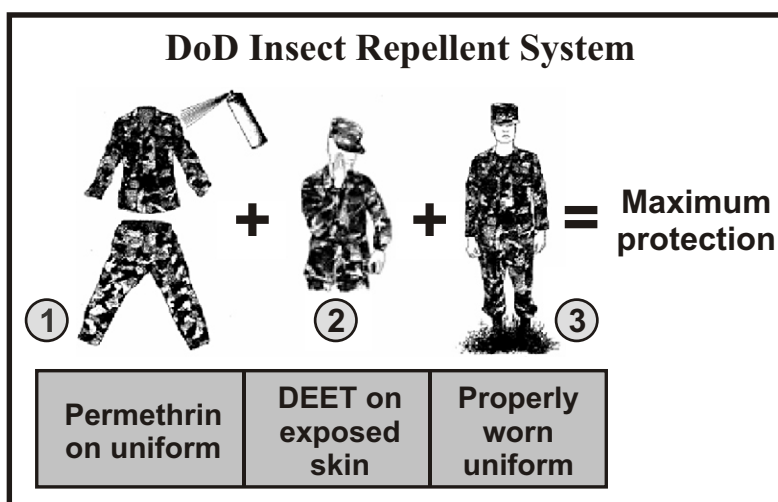


Figure 4

The DOD Insect Repellent System is applied in three steps:

1. Treat your uniform with the standard military clothing repellent (permethrin).
- Use the individual dynamic absorption (IDA) kit. This product is a permethrin impregnation kit that contains 40-percent permethrin. One kit treats one uniform, and the treatment lasts through approximately 50 washes (generally considered the combat life of the uniform).

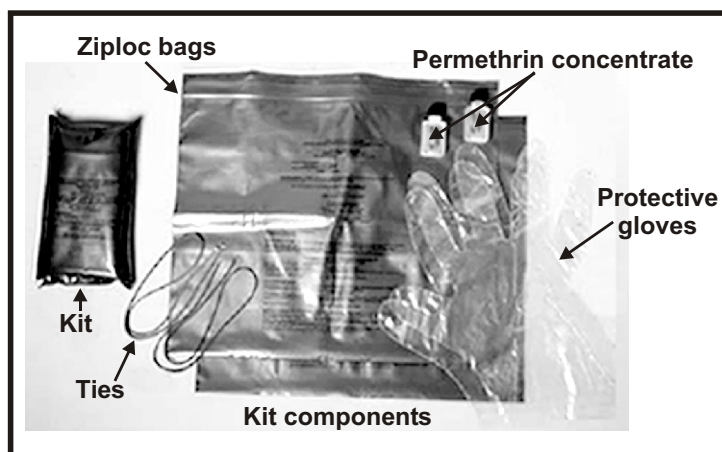


Figure 5: Permethrin impregnation kit (IDA), NSN 6840-01-345-0237

- If the IDA kit is not available, use the aerosol spray can, 0.5-percent permethrin. One application of approximately $\frac{3}{4}$ -can lasts through 5-6 washes. Treat your uniform PRIOR to deploying. Follow all label directions.



Figure 6: Permethrin aerosol spray can (NSN 6840-01-278-1336), 0.5% permethrin, 1 application lasts through 6 washes

(**Note:** Use permethrin only on clothing, netting, tents, ground cloths, or other gear. Do NOT treat underwear or the inside of the cap. Permethrin has no odor once the item of clothing is treated. Do NOT dry clean permethrin-treated garments as solvents will remove the permethrin. Treated garments can, however, be personally or professionally laundered, starched, and pressed as usual. Getting the treated uniform wet from rain or by fording streams will not affect the treatment.)

2. Apply a thin coat of the standard military skin repellent (DEET) to all areas of exposed skin. Use the 33% controlled release DEET lotion. One application protects for up to 12 hours depending on the climate. Follow label directions.



Figure 7: 33% controlled release DEET lotion (NSN 6840-01-284-3982)

(**Note:** Use DEET only on exposed skin. Do not apply underneath clothing. Only a thin, even coating of DEET is necessary. A larger quantity or higher concentration does not work better. Avoid the eyes and lips, and do not apply over cuts or sunburned or injured skin. DEET will destroy plastic, so be cautious when applying it if you wear glasses or storing it when not in use.)

3. Wear your uniform properly; it acts as a physical barrier against insects. Wear the sleeves rolled down. Close all openings in your clothing that might provide access to insects (tuck pants into your boots and undershirt into your pants). Wear your uniform loosely because some insects, such as mosquitoes, can bite through fabric that is pulled tight against the skin.

(**Note:** If your uniform is treated with the aerosol spray can permethrin you will need multiple re-applications during your deployment. Commanders must plan accordingly to ensure this protection is maintained for their personnel. Consistent re-application monitored at the unit level is key to ensure these re-applications are occurring when required. Remember you must treat all the uniforms you plan to wear)

Frequently asked questions (FAQ) about the DOD Insect Repellent System:

Q. Can I use DEET with camouflage face paint?

A. Yes. Camouflage face paint with DEET is available, order NSN 6840-01-493-7334 (new CFP with DEET, 12 compacts per box). Otherwise, apply standard military DEET lotion to the skin first, followed by regular camouflage face paint.

Q. Can I use DEET with sun screen?

A. DEET can be used with sun screen, but it may reduce the duration of the effectiveness of sun screen. To minimize this effect, apply sun screen approximately 30 minutes to one hour prior to applying the DEET so that the sun screen has time to penetrate and bind to the skin first. Sun screen does NOT reduce the effectiveness of the DEET.

Q. Can I use repellents if I am pregnant?

A. Yes, especially if you will be exposed to disease-carrying insects. Although it is wise to exercise a cautious approach when pregnant (try to avoid situations where disease-carrying insects may be present, use repellent sparingly, and wash off and discontinue use when insect exposure has ceased), there is no convincing evidence that DEET or permethrin, when used in accordance with label directions, will have an adverse effect on the mother or fetus. Conversely, insect-borne diseases such as malaria can be very harmful to both mother and fetus. Therefore, the Center for Disease Control (CDC) recommends that pregnant women, who are traveling to any area where they may be exposed to insect-borne diseases, use the same protective measures as non-pregnant travelers.

BED NETS

In addition to the DOD Insect Repellent System, you can also protect yourself from insects by sleeping or resting under a bed net. Mosquitoes and sand flies are particularly active at dusk and in the evening. Some species even have peak feeding around midnight or in the early hours of the morning.

It is important to treat the bed net with permethrin for added protection because sand flies are much smaller than mosquitoes and may fit through the mesh of the net. In addition, mosquitoes can bite through the mesh if the net drapes against your skin. Once treated, your bed net will protect you against sand flies, mosquitoes, and other biting insects.



Figure 8: Insect net protector (mosquito bed net), NSN 7210-00-266-9736, with poles, (NSN 7210-00-267-5641), on folding cot

How to properly use the bed net

The insect net protector (NSN 7210-00-266-9736) is a finely woven (27-mesh/inch), olive drab, nylon canopy that can be used with the folding cot, hammock, steel bed, or shelter half-tent. An insect net protector frame (NSN 7210-00-267-5641) is available and includes poles, folding cot, and insect net protector.

Erect the net over your cot so that there are no openings. The insect net protector should be erected and supported in such a way as to prevent contact with the net while sleeping, which will keep mosquitoes and other insects from biting the individual through the net.

Do not leave the net in contact with the ground as crawling arthropods may use it to gain access to the sleeping area. Tuck the net under the mattress or sleeping bag. Bed nets should be installed before dusk, which is when many mosquitoes become active.

Prior to sleeping, any mosquitoes trapped inside the enclosure should be killed with the standard insecticide space spray, 2-percent d-phenothrin (NSN 6840-01-412-4634).

(Note: Avoid breathing the pesticide vapors while spraying, and DO NOT USE 2-PERCENT D-PHENOTHRIN ON THE SKIN OR CLOTHING.)

Before climbing inside, spray the net lightly with permethrin aerosol, or use the 2-gallon sprayer method prior to setting it up. The permethrin will help protect against arthropods that are small enough to fit through the mesh of the net (sand flies). Allow the net to dry before handling. Permethrin applied by the 2-gallon sprayer method provides protection for several months to a year or more.

PERSONAL PROTECTIVE GEAR WITH NSNs

NSN	Item Description
6840-00-753-4963	Insect repellent, clothing and personal, 75% DEET, 2 ounces
6840-01-067-6674	Insecticide, d-phenothrin, 2 percent
6840-01-278-1336	Insect repellent, clothing, permethrin aerosol, 6 ounce can
6840-01-284-3982	Insect repellent, personal, 33% DEET, 2 ounces
7210-01-010-2052	Insect bar (netting), cot type
7210-00-267-5641	Poles, insect bar (for suspending insect bar)
8415-01-035-0846	Parka, fabric mesh, insect repellent (DEET jacket) size small
8514-01-035-0847	Parka, fabric mesh, insect repellent (DEET jacket) size medium
6840-01-284-3982	Insect repellent, personal, 33% DEET
6840-00-753-4963 ethanol	Insect repellent, clothing and personal application, 75% DEET, 25% FOR USE WITH REPELLENT PARKA ONLY
6840-00-142-8965	Insect repellent, personal, approximately 30% DEET
6840-01-288-2188	Insect repellent, personal application and sun screen, 20% DEET/SPF 15
6840-01-345-0237	Insect repellent, clothing application, 40% permethrin (IDA)
6840-01-278-1336	Insect repellent, clothing application, aerosol, 0.5% permethrin (permethrin arthropod repellent)
6840-01-334-2666	Insect repellent, clothing application, permethrin, 40% liquid (2-gal sprayer)
6840-01-412-4634	Insecticide, d-phenothrin, minimum 1.92%, space
7210-00-266-9736	Insect net protector, cot type
7210-00-267-5641	Poles, folding cot, 4 poles/set insect net protector
8415-00-935-3130	Head net, insect
8415-01-035-0846	Parka, fabric mesh, insect repellent (DEET jacket), Small
	-0847 Medium
	-0848 Large
3740-00-641-4719	Sprayer, pesticide, manually carried, pressure type, 2-gal, equipped with pressure gauge

FIELD SANITATION IN CONTINGENCY OPERATIONS

3740-01-332-8746 Gauge, pesticide sprayer (for retrofit use on 2-gal sprayers not equipped with a gauge)

4330-01-332-1639 Filter, fluid, (must be used with gauge NSN 3740-01-332-8746)

8514-01-035-0848 Parka, fabric mesh, insect repellent (DEET jacket) – size large

Desert BDUs pretreated with permethrin are available and can be requested through the rapid fielding initiative. Sizes and NSNs are available below:

BDU Type XI: Insect repellent treated desert camouflage BDUs

TROUSERS		COAT	
Size/Length	NSN	Size/Length	NSN
XS-XS	8415-01-453-2860	XS-XS	8415-01-453-1348
XS-S	8415-01-453-3008	XS-S	8415-01-453-1393
XS-R	8415-01-453-3035	XS-R	8415-01-453-1435
XS-L	8415-01-453-3045	XS-L	8415-01-453-1454
S-XS	8415-01-453-3209	S-XXS	8415-01-453-1478
S-S	8415-01-453-3219	S-XS	8415-01-453-1496
S-R	8415-01-453-3226	S-S	8415-01-453-2034
S-L	8415-01-453-3239	S-R	8415-01-453-2036
M-XS	8415-01-453-3290	S-L	8415-01-453-2047
M-S	8415-01-453-3306	S-XL	8415-01-453-2054
M-R	8415-01-453-3313	M-XXS	8415-01-453-2128
M-L	8415-01-453-3318	M-XS	8415-01-453-2135
M-XL	8415-01-453-3322	M-S	8415-01-453-2153
M-XXL	8415-01-453-3333	M-R	8415-01-453-2179
L-S	8415-01-453-3340	M-L	8415-01-453-2298
L-R	8415-01-453-3347	M-XL	8415-01-453-2301
L-L	8415-01-453-3354	M-XXL	8415-01-453-2472
L-XL	8415-01-453-3762	L-XS	8415-01-453-2482
L-XXL	8415-01-453-3824	L-S	8415-01-453-2547
XL-S	8415-01-453-3863	L-R	8415-01-453-2577
XL-R	8415-01-453-3869	L-L	8415-01-453-2619
XL-L	8415-01-453-3873	L-XL	8415-01-453-2628
XL-XL	8415-01-453-3998	L-XXL	8415-01-453-2636
XL-XXL	8415-01-453-4024	XL-S	8415-01-453-2821
		XL-R	8415-01-453-2832
		XL-L	8415-01-453-2855

SECTION B: DNBI PREVENTION

DNBI are the major medical threat during military operations. Preventive medicine DNBI surveillance must include their effects on U.S., allied, coalition, and host nation (HN) forces and the local populace. As in war, DNBIs are the leading cause of manpower losses in stability operations and support operations. Individual, unit, and field sanitation team PMM must be stressed and applied. Preventive medicine personnel can identify the diseases and recommend control and preventive measures.

DISEASES

The following communicable diseases are common to the region in and around Iraq:

Diarrheal illness

Description: Travelers' diarrhea (TD) is the most common illness affecting Soldiers. Each year between 20%-50% of international travelers, an estimated 10 million persons, develop diarrhea. Rates of illness in troops vary, but certain campaigns have rates similar to this. The onset of TD usually occurs within the first week of deployment but may occur at any time while away from home station and even after returning home. Attack rates are similar for men and women. The primary source of infection is ingestion of food or water contaminated with fecal matter.

Symptoms: Most TD cases begin abruptly. The illness usually results in increased frequency, volume, and weight of stool. Altered stool consistency also is common. Typically, four to five loose or watery bowel movements occur each day. Other commonly associated symptoms are nausea, vomiting, abdominal cramping, bloating, fever, urgency, and malaise. Most cases are benign and resolve in 1-2 days without treatment. TD is rarely life-threatening. The natural history of TD is that 90% of cases resolve within 1 week, and 98% resolve within 1 month.

Prevention: Soldiers can minimize their risk for TD by practicing the following effective preventive measures:

- Wash hands properly and frequently.
- Avoid eating foods or drinking beverages purchased from street vendors or other unapproved sources.
- Avoid eating raw or undercooked meat and seafood.
- Avoid eating raw fruits (e.g., oranges, bananas, avocados) and vegetables unless from an approved source (even if from an approved source, it is advisable to peel these items before eating them). Disinfect raw fruit with 200 ppm of chlorine or food service disinfectant for 30 minutes, then rinse thoroughly prior to eating. Soldier may also immerse fruit into 160-degree water for one minute.
- Some antibiotics administered in a once-a-day dose are 90% effective at preventing traveler's diarrhea; however, antibiotics are not recommended as a prophylaxis.

Diagnosis: In addition to TD, loose stools can come from a change in eating and drinking patterns along with a change in environment. Diarrhea is defined as more than three loose stools in a 24-hour period. Loose stools associated with fever or blood is cause for alarm;

seek health care immediately. If stools are loose but do not persist, observation is probably the best course of action.

Treatment: TD usually is a self-limited disorder and often resolves without specific treatment; however, oral rehydration is often beneficial to replace lost fluids and electrolytes. Clear liquids are routinely recommended for adults. Soldiers who develop three or more loose stools in an 8-hour period, especially if associated with nausea, vomiting, abdominal cramps, fever, or blood in stools may benefit from antimicrobial therapy. Antibiotics are usually given for 3-5 days. If diarrhea persists despite therapy, Soldiers should seek further evaluation. Check with your medical staff before taking Imodium or another antimotility agent.

Upper respiratory illness (URI)

Description: URIs includes the common cold, sore throats, and flu. URI is usually caused by viruses but may also be due to bacteria or other organisms. A URI is rarely serious but often causes bothersome symptoms.

Symptoms:

- Runny or stuffy nose
- Sore throat
- Fever
- Headache
- Cough
- Malaise, or “feeling lousy”
- Muscle aches
- Loss of appetite
- Ear pain

(**Note:** Some symptoms of URI are actually environmental allergies. These do not respond to antibiotics but may respond to allergy medicine from your medical staff.)

Prevention:

- Because of close living conditions, these conditions may spread quickly. If possible Soldiers should sleep alternating head to toe in their sleeping quarters (lay one bunk with Soldier’s head to the north and the next bunk with the Soldier’s head to the south). In addition try to space the bunks at least 3 feet apart (“3 foot rule”), as this has been shown to cut down on disease transmission .
- Avoid touching your eyes and mouth without washing your hands first.
- Wash your hand properly and frequently.

Diagnosis: There are many different types of URIs, including the following:

- Common cold - usually due to a virus
- Influenza - due to influenza virus infection
- Acute sinusitis or chronic sinusitis - an infection which involves the nasal sinuses
- Otitis externa - an infection of the outer ear
- Acute otitis media - an infection of the middle ear behind the eardrum
- Pharyngitis - sore throat
- Acute bronchitis - an infection in the lower windpipes (usually viral)

Treatment: Time, usually 3-5 days, will cure most conditions. Some Soldiers will need some allergy medicines.

(**Note:** There have been a few cases of fatal pneumonia-like illness in Soldiers in OIF. These fatalities are not believed to all be from the same infectious agent. If you or another Soldier is having trouble breathing or high fever with a cough, seek immediate health care.)

Leishmaniasis

Description: Leishmaniasis is a parasitic infection of animals and humans caused by the bite of some species of sand flies that are infected by a parasite named *Leishmania*. Leishmaniasis should not be confused with sand fly fever, which is a viral disease transmitted by sand flies. Person-to-person transmission by blood transfusion and sexual contact has been reported but is rare. There are three forms of the disease:

- Cutaneous leishmaniasis (CL) appears as a non-healing ulcer lasting months to years if untreated.
- Mucocutaneous leishmaniasis (MCL) patients develop ulcerative or granulomatous (granular) lesions of the nose and mouth linings, which generally occur after or concurrent with CL lesions.
- Visceral leishmaniasis (VL), the most severe form of leishmaniasis with 95% mortality in untreated cases, is a chronic disease involving the liver and spleen.



Figure 9

Symptoms: Symptoms vary depending on the type of leishmaniasis:

- CL starts with a bump in the skin that enlarges and becomes an ulcer. Lesions may be single or multiple. CL incubation is usually 2-8 weeks but may be years depending on initial amount of infectious material in the original bite.



Figure 10

- MCL is characterized by nasopharyngeal (nose and mouth) tissue destruction that can be very disfiguring.

- VL is typified by fever (which is irregular, often with two daily peaks), enlarged spleen and liver, anemia, reduction of white blood cells, progressive emaciation, and weakness. VL incubation is normally 3-8 months (range: from 10 days to more than 10 years).

Prevention:

- Use the DOD Insect Repellent System described above.
- Use permethrin treated bed nets as described above.

(**Note:** Sand flies are small enough to penetrate very fine mesh screens (10-12 mesh/cm) that are smaller than standard issue bed netting, but permethrin treatment of standard issue bed netting makes them effective barriers against sand flies.)

- When possible, limit outdoor activity at dusk and during the evening when the sand fly is most active. Sand flies, although generally nocturnal, frequently feed during the day.
- If possible, buildings should have window screens or other barriers to keep sand flies from entering.

Diagnosis:

- CL and MCL are diagnosed by a blood test.
- Diagnosis of VL is made by culture of the organism from a biopsy specimen or aspirated material or from the appearance of amastigotes (a life stage of the parasite) in stained smears from bone marrow, the spleen, the liver, lymph nodes, or blood. Acute visceral leishmaniasis will frequently present as a severe fever that is often confused with malaria.

Treatment: If you have a bite that will not heal, seek medical attention. If caught early, cutaneous leishmaniasis treatment may consist of a controlled burning process with a special medical device. Some forward medical elements have the special device for early cutaneous disease treatment. More severe cutaneous disease and all visceral disease are treated with special drugs such as pentostam or glucantime. Drug treatment for military personnel at this time is offered in the United States at both Walter Reed Army Medical Center and Brooke Army Medical Center.

Sand fly fever

Description: Sand fly fever is a viral infection transmitted by the bite of an infected sand fly (*Phlebotomus papatasi*). It is different than leishmaniasis. There is no direct human-to-human transmission and the only isolation required is to protect infected Soldiers from further sand fly bites. High levels of infection are present from about 24 hours prior to onset of fever until about 24 hours after fever resolves.

Symptoms:

- Fever to 103°F (40°C)
- Headache

- Myalgia (muscle ache)
- Supraorbital (around the eye) pain (intense) or retrobulbar (behind the eye) pain with eye movement
- Limb stiffness
- Malaise
- Gastrointestinal symptoms (nausea, vomiting)
- Facial congestion
- Neck stiffness

Prevention:

- Use the DOD Insect Repellent System as described early in the handbook.
- Use permethrin treated bed nets.

(**Note:** Sand flies are small enough to penetrate very fine mesh screens (10-12 mesh/cm) that are smaller than standard issue bed netting, but permethrin treatment of standard issue bed netting makes them effective barriers against sand flies.)

- Limit outdoor activity at dusk and during the evening when possible, when the sand fly is most active. Sand flies, although generally nocturnal, frequently feed during the day.
- If possible, buildings should have window screens or other barriers to keep sand flies from entering.

Diagnosis: Sand fly fever can be diagnosed from blood and fluid samples. The patient usually gets better prior to disease confirmation. The incubation period is 3-6 days and the duration of illness is 2-4 days; convalescence may be a week or longer. Patients may have lethargy, depression, and fatigue for weeks after recovery.

Treatment: No specific treatment is available other than to provide supportive care. Limited duty or local hospitalization is recommended until fever resolves. Occasionally, convalescence may be prolonged and some patients may require evacuation (EVAC). Single infection confers lasting immunity against the same strain.

Malaria

Description: Malaria is a parasitic disease transmitted through the bite of certain mosquitoes (*Anopheles*). The disease is known to occur in tropical and subtropical areas worldwide. Most mosquito species feed at dusk and during the early evening. Some species have peak feeding around midnight or in the early hours of the morning. Malaria is not transmissible from person to person.

Symptoms: Malaria may present a varied clinical picture depending on the parasite involved. Symptoms may begin with indefinite malaise and a slow rising fever several days in duration, followed by shaking chills and rapidly rising temperature, usually accompanied with headache and nausea and ending with profuse sweating. After a period

free of fever, the cycle of chills, fever, and sweating is repeated every one to three days (cyclic fever). Duration of the attack may vary from a week to a month or longer if left untreated. Infections may persist for as long as 50 years with recurrent fever episodes.

Prevention:

- Use the DOD Insect Repellent System as described early in the handbook.
- Use permethrin treated bed nets.
- Limit outdoor activity at dusk and during the evening when possible, when the mosquito is most active. Although generally nocturnal, mosquitoes frequently feed during the day.
- If possible, buildings should have window screens or other barriers to keep mosquitoes from entering.
- Take your malaria chemoprophylaxis (prevention) as directed by your chain of command. Malaria chemoprophylaxis is required when operating in malaria endemic areas. There are four choices available to the military community for malaria:

Mefloquine: Mefloquine tablets are one of several types of drugs used to prevent malaria. The type of drug prescribed by your health care provider will be based on the area of the world you are traveling to and your medical condition.

- Dosage: Take one tablet weekly, preferably beginning 2 weeks before arrival in country and continuing for 4 weeks (4 doses) after departure.
- How do I take the tablets?

Take with food or milk.

Take this medication as prescribed for full course of treatment.

It is important that you not miss any doses and that you take the drug on a regularly scheduled basis.

Store at room temperature away from sunlight and moisture.

Do not share this medication with others.

- Are there any side effects?

You may have an upset stomach, stomach pain, nausea, vomiting, diarrhea, headache, insomnia, or lightheadedness. These effects should subside as your body adjusts to the medication. If these symptoms persist or become severe, inform your health care provider.

This medication may cause dizziness or restlessness. Use caution when driving or engaging in activities requiring alertness.

Call your health care provider if you develop unexplained anxiety, mood changes, depression, restlessness, or confusion.

If you experience any allergic reactions such as flushing, itching, skin rash, breathing difficulties, or vision problems, stop taking the medication and contact your health care provider.

- Is there any reason I should not take mefloquine?

Tell your health care provider or pharmacist your medical history including any psychiatric disorders, heart or liver problems, seizure disorders, and allergies you may have, especially allergies to other drugs.

Tell your health care provider if you are taking any beta-blocker (propranolol), chloroquine, quinine, quinidine, or valproic acid.

Some vaccines may not work if given while you are taking mefloquine. You may need to finish taking your vaccines at least 3 days before starting mefloquine.

- What if I am pregnant or breast-feeding?

This medication should be used only when clearly needed during pregnancy. Discuss the risks and benefits with your health care provider.

This drug is excreted into breast milk. Consult with your health care provider before breast-feeding.

- What should I do if I miss a dose?

If you miss a dose for any reason, take the missed dose as soon as possible and then continue the usual dosing schedule.

Do NOT “double-up” on doses.

(Note: Recently, attention has been drawn to possible suicidal or homicidal risks associated with the use mefloquine. To date there is little to no proof that either is the case. All cases of suicides and homicides have had previous psychological issues. Still, if you have a history of depression or other psychological problems, do not take mefloquine. Also note that some Soldiers taking this drug do have very vivid and sometimes bizarre dreams. That does not mean they will have other psychological side effects. Report any concerns or side effects to your medical provider. Mefloquine can cause an ulcer if held in the mouth too long, so swallow immediately with a large amount of water.)

Doxycycline: Doxycycline (or “doxy”) is an antibiotic also used to treat a wide variety of bacterial infections, including the prevention and treatment of anthrax and for the prevention of TD. It is also one of several types of drugs used to prevent malaria.

- Dosage: Take one tablet daily, preferably beginning 1-2 days before arrival in country and continuing for 4 weeks after departure.
- How do I take doxycycline?

Take each dose with a full glass of water. It is important to ensure good daily water intake while taking this medication.

Take with food if stomach upset occurs unless your health care provider directs you otherwise.

Store at room temperature away from sunlight and moisture.

Antibiotics work best when the amount of medicine in your body is kept at a constant level. Do this by taking the medication at evenly spaced intervals throughout the day and night.

Continue to take this medication until the fully prescribed amount is finished, even if symptoms disappear after a few days. Stopping therapy too soon may not treat the infection and can lead to active disease.

Do not share this medication with others.

° Are there any side effects?

You may have an upset stomach, diarrhea, nausea, headache, and vomiting during the first few days as your body adjusts to the medication. If these symptoms persist or become severe, inform your health care provider.

Doxycycline increases sensitivity to sunlight and may make you more prone to sunburn. Wear protective clothing, limit your sun exposure and use sun screen as countermeasures.

Notify your health care provider if you develop breathing difficulties, skin rash, hives, or sore throat while taking this medication.

Use of this medication for prolonged or repeated periods may result in a secondary infection (e.g., oral, bladder, or vaginal yeast infection).

° Is there any reason I should not take doxycycline?

Tell your health care provider if you have other illnesses or any allergies, especially allergies to drugs.

Tell your health care provider about all the medicines you take (prescription, nonprescription, and herbal), especially if you take other antibiotics. Your dose may need to be adjusted or changed.

This medicine may decrease the effectiveness of oral contraceptives. Consult your health care provider or pharmacist about other types of birth control.

Avoid taking antacids, iron preparations, or vitamin products within 2 to 3 hours of taking this medication. These products bind with the antibiotic preventing its absorption.

- What if I am pregnant or breast-feeding? This medicine should not be used during pregnancy or when breast-feeding.
- What should I do if I miss a dose?

If you miss a dose, take it as soon as remembered unless it is almost time for the next dose.

If it is nearly time for the next dose, skip the missed dose and resume your usual dosing schedule.

Do NOT “double-up” on doses.

Malarone: Malarone, also known as atovaquone and proguanil, is one of several types of drugs used to prevent malaria.

- Dosage: Take one tablet daily starting 1-2 days before arrival in theater and continuing 7 days after departure from theater.
- How do I take the tablets?

Take with food or milk.

Take this medication as prescribed for full course of treatment.

It is important that you not miss any doses and that you take the drug on a regularly scheduled basis.

Store at room temperature away from moisture and heat.

Do not share this medication with others.

Take a repeat dose of atovaquone and proguanil if vomiting occurs within 1 hour of taking a dose. If vomiting persists, consult your health care provider to determine if you can take a different anti-malarial medication.

- Are there any side effects?

You may experience abdominal pain, nausea, vomiting, headache, diarrhea, weakness, loss of appetite, or itching. These effects should subside gradually as your body adjusts to the medication. Continue to take the atovaquone and proguanil as prescribed, and inform your health care provider.

This medication may cause dizziness. Use caution when driving or engaging in activities requiring alertness.

If you experience an allergic reaction (swelling of the lips, tongue, or face; shortness of breath; closing of your throat; or hives), stop taking atovaquone and proguanil and immediately seek emergency medical attention.

Side effects other than those listed here may also occur. Talk to your health care provider about any side effect that seems unusual or that is especially bothersome.

Chloroquine: Chloroquine tablets are used to prevent and treat malaria. They are also used to treat certain infections of the intestinal tract and certain types of skin problems.

- ° Dosage: Take one tablet weekly starting 2 weeks prior to arrival in theater and continuing 4 weeks after departure from theater.
- ° How do I take the medication?

Store at room temperature away from sunlight and moisture.

Take chloroquine with food to prevent stomach upset.

Take this medication exactly as prescribed.

Do not stop taking it without consulting your health care provider. It is important to continue taking it for the length of time prescribed. Stopping therapy too soon may not treat the infection and can lead to active disease.

While taking this medication, your health care provider may schedule lab tests to check your eyesight, hearing, and blood.

Do not share this medication with others.

- ° Are there any side effects?

Nausea, vomiting, stomach upset, cramps, loss of appetite, diarrhea, tiredness, weakness, or headache may occur the first several days as your body adjusts to the medication. If these effects continue or become bothersome, inform your health care provider.

Call your health care provider if you develop any changes in your sight such as blurred vision, trouble seeing at night, or problems focusing clearly.

Also, report if you have any difficulty hearing or experience ringing in the ears.

- ° Is there any reason I should not take chloroquine?

Tell your health care provider if you have pre-existing liver disease, blood disorders, or psoriasis.

Children are very sensitive to the effects of chloroquine. It is important to keep this and all medications out of the reach of children.

Tell your health care provider of any other medication you are taking, (including nonprescription), especially cimetidine (Tagamet), kaolin (Kaopectate), or magnesium trisilicate (Gaviscon).

- What if I am pregnant or breast-feeding?

This drug should be used only if clearly needed during pregnancy.

Since small amounts of this medication are found in breast milk, consult your health care provider before breast-feeding.

- What should I do if I miss a dose?

If you miss a dose for any reason, take the missed dose as soon as possible and then continue the usual dosing schedule.

Do NOT “double-up” on doses.

Diagnosis: Diagnosis is based on seeing the parasite in blood smears. This may need to be repeated every day for 3 - 4 days to confirm presence. Malaria MUST be considered in all Soldiers with fever in a malaria region. If not diagnosed and treated promptly, falciparum can be fatal. Disease can occur before parasites are detectable by blood smear, but patients critically ill due to malaria will have a detectable parasitemia at some time in their illness. Patients with suspected malaria should have blood smear exams every 8-12 hours for 48 hours to exclude malaria. Persons on effective chemoprophylaxis may have very low parasitemias and atypical presentations.

Treatment: Seek medical attention. Treatment is with antiparasite drugs. These are usually higher doses of the same drugs used for prevention.

(**Note:** Do not donate blood for three years after being in a malaria area. Notify your medical staff if you are on flight status, as certain medications may be contraindicated.)

Dengue fever

Description: Dengue [DEN-ghee] is a flu-like viral disease spread by the bite of infected mosquitoes. Dengue fever is also known as “break-bone” fever because of the severe joint pains associated with the fever. Dengue hemorrhagic fever is a severe, often fatal complication of dengue. Dengue and dengue hemorrhagic fever are caused by any of the dengue family of viruses. Infection with one virus does not protect a person against infection with another.

Dengue occurs in most tropical areas of the world and is spread by the bite of an *Aedes* mosquito. It cannot be passed directly from person to person. Infected persons should be protected from further mosquito bites until all their symptoms resolve; otherwise, they are at risk for spreading the virus to a mosquito, which can in turn spread the dengue to another person.

(**Note:** Unlike the mosquitoes that cause malaria, *Aedes* mosquitoes bite during the day.)

Symptoms:

- High fever, rash

- Severe headache
- Pain behind the eyes
- Muscle and joint pain
- Nausea, vomiting, loss of appetite
- Rash usually lasts 3 to 4 days after the start of the fever

Prevention:

- Use the DOD Insect Repellent System as described above.
- Use permethrin treated bed nets.

Diagnosis: Dengue is diagnosed by a blood test.

Treatment: There is no specific treatment for dengue. Persons with dengue should rest and drink plenty of fluids. They should be kept away from mosquitoes for the protection of others. Supportive care for dengue hemorrhagic fever includes replacing lost fluids. Some patients need transfusions to control bleeding. The illness can last up to 10 days, but complete recovery can take as long as a month. Most dengue infections result in relatively mild illness, but some can progress to dengue hemorrhagic fever. In this form of the disease, the blood vessels start to leak, causing bleeding from the nose, mouth, and gums. Bruising can be a sign of bleeding inside the body. Without prompt treatment, the blood vessels can collapse, causing shock (dengue shock syndrome). Dengue hemorrhagic fever is fatal in about 5 percent of cases, mostly among children and young adults.

Leptospirosis

Description: Leptospirosis is a bacterial disease transmitted by exposure to water contaminated with the urine of infected animals. Many different kinds of animals carry the bacterium; they may become sick but sometimes have no symptoms. Humans become infected through contact with water, food, or soil containing urine from these infected animals. This may happen by swallowing contaminated food or water or through contact with the eyes or nose or contact with broken skin. The disease is not known to spread from person to person.

Symptoms (abrupt onset):

- Fever (100% - may be biphasic [two-phases])
- Myalgia (muscle aches) (97%, especially calves and thighs)
- Headache (95%)
- Chills (85%)
- Sore throat (72%)
- Nausea (70%)

- Vomiting (65%)
- Eye pain (50%)
- Diarrhea (23%)

Prevention:

- Frequent hand washing
- Command emphasis on educating troops to avoid swimming, wading, and exposure to contaminated soil
- Control local rodent populations
- Consider troop prophylaxis in endemic areas with confirmed cases: doxycycline 200 mg once weekly during periods of high exposure

Treatment: All cases should receive either doxycycline 100 mg twice a day for 7 days, if well enough to take food. If severely ill, high doses of intravenous antibiotics will be required. Within 12 hours of starting therapy, high fever and low blood pressure (hypotension) may occur.

Schistosomiasis

Description: Acute schistosomiasis (also known as Katayama fever) is a parasitic infection acquired by swimming, wading, bathing, or washing in fresh water that contains snails and that has been contaminated by feces or urine carrying parasite eggs from an infected person. Schistosomiasis dermatitis (swimmer's itch) is a rash that occurs in the same manner, but the infected snails are contaminated with animal parasites and not human parasites. Acute schistosomiasis only occurs from the human parasite. Infected snails release large numbers of minute, free-swimming larvae (cercariae) that are capable of penetrating the unbroken skin of the human host. Even brief exposure to contaminated fresh water, such as wading, swimming, or bathing can result in infection. Human schistosomiasis cannot be acquired by wading or swimming in salt water (oceans or seas).

Symptoms:

- Acute schistosomiasis
 - Fever (all)
 - Chills
 - Sweating
 - Headache
 - Cough (most)
 - Diarrhea (50%)

- Weight loss
- Schistosomiasis dermatitis (swimmer's itch)

Prevention: Command emphasis and education of Soldiers to avoid exposure (swimming or wading with bare skin contacting fresh water, especially lakes, marshes, and slow-moving waters). Vigorous towel-drying or application of rubbing alcohol can prevent penetration of parasites after water contact.

Diagnosis: While schistosomiasis is not a threat in most of Central Asia, it does occur in the Arabian Peninsula and parts of Southwest Asia. Schistosomiasis dermatitis (swimmer's itch) occurs within 24 hours of penetration of skin by the infective, forked-tailed cercariae (water snails). Clinical syndrome of acute schistosomiasis occurs after 2 weeks to 3 months. If untreated, acute symptoms of the infection will last 2-4 weeks; however, the Soldier may develop chronic symptoms.

(**Note:** Exposure history is essential to consider the diagnosis.)

Treatment: Treatment of acute schistosomiasis with schistosomicidal drugs may result in acute, severe, possibly life-threatening clinical deterioration. Treatment will relieve chronic disease but the Soldier may still be ill for 2-4 weeks. Swimmer's itch can be treated with a topical steroid and an antihistamine (benadryl). Limited duty or hospitalization depends on the severity of the illness; evacuation may be indicated with severe disease.

Typhoid and paratyphoid enteric fever

Description: Typhoid and paratyphoid enteric fever is a contagious infection of the intestines that affects the whole body. It is caused by a bacterium called *Salmonella typhi* that is found in human waste. In developing countries, typhoid often occurs in epidemics (many people get sick at once). Typhoid is spread when a person drinks or eats food and water contaminated by human waste (stool or urine) containing *Salmonella typhi* bacteria. The infected organism is dispersed by flies.

Symptoms:

- Fever (75-100%)
- Headache (59-90%) frequently intense, frontal
- Anorexia (39-91%)
- Cough (28-86%)
- Myalgia (muscle aches) (12-91%)
- Constipation (10-79%)
- Weakness (10-87%)
- Diarrhea (37-57%)
- Vomiting (24-54%)

- Nausea (23-54%)
- Sore throat (6-84%)
- Chills (16-37%)
- Abdominal pain (19-39%)
- Sweats (33%)
- Rose spots: 2-4 mm blanching red lesions occurring in crops of about 10 located on upper abdomen and persisting several hours to several days; spots appear 7-10 days into illness (13-46%)

Prevention:

- Vaccine administered to all deployed personnel
- Strict sanitation
- Hand washing/personal hygiene
- Strict water purification/food preparation
- Fly control:
 - Insecticide spraying
 - Screening
 - Proper garbage disposal

Treatment: Seek medical attention immediately. Supportive fluid and nutritional therapy is essential. Antibiotics (ciprofloxin) can be obtained from medical staff. Diarrhea and vomiting precautions should be observed while ill and convalescing. Disinfect contaminated articles. Since excretion of organisms typically persists for several weeks after resolution of illness and persists more than 1 year in up to 3% of patients, convalescing patients should be evacuated rather than returned to field setting. Avoid fever reducing medicines. Evacuate once stabilized.

Rabies

Description: Rabies is a preventable viral disease of mammals most often transmitted through the bite of a rabid animal. Early symptoms of rabies in humans are nonspecific, consisting of fever, headache, and general malaise. Rabies and the rabies-like viruses can occur in animals anywhere in the world. Any mammal can get rabies. It is also possible that people may get rabies if infectious material from a rabid animal, such as saliva, gets directly into their eyes, nose, mouth, or a wound. Non-bite exposures to rabies are rare. You cannot get rabies from other types of contact such as petting a rabid animal or contact with the blood, urine, or feces of a rabid animal.

Symptoms: Symptoms usually develop within weeks of acquiring the virus. However, symptoms may occur days or even years after the exposure. Symptoms include the following:

- Anxiety
- Fever
- Headaches
- Tingling sensations in the area of the animal bite
- Confusion
- Muscle spasms
- Trouble and pain with swallowing, which may cause a fear of water
- Loss of consciousness
- Seizures, which may cause a group of muscles in the body to suddenly shake violently and uncontrollably

Prevention:

- Your best advice is to not have any activity with wild animals.
- Do not have base camp pets.
- There is a vaccine, but it is provided only under certain circumstances (veterinary personnel normally receive this). Your command will be informed prior to deployment if this vaccination is necessary.

Treatment: Medical assistance should be obtained as soon as possible after an exposure. One of the most effective methods to decrease the chances for infection involves thorough and immediate washing of the wound with soap and water. Specific medical attention for someone exposed to rabies is called post-exposure prophylaxis or PEP. There have been no vaccine failures in the United States (i.e., someone developed rabies) when PEP was given promptly and appropriately after an exposure. Current vaccines are relatively painless and are given in your arm, like a flu or tetanus vaccine.

NON-BATTLE INJURIES

There are two steps that are extremely helpful in the prevention of non battle injury:

- **Supervision:** Preventing accidents will prevent injuries. Statistics show that 80 percent of all accidents are caused by human error, and supervision is the key to preventing human error. Simply put, leaders can reduce human error by establishing sound standards and consistently enforcing them. If, for example, you sit in the passenger seat and allow a driver to operate a vehicle too fast for conditions, you have failed to supervise, and you have failed in your leadership responsibility. You might make that trip; however, you have set the stage for a future accident. Consistent enforcement demonstrates “tough caring,” which is looking out for the welfare of Soldiers.

- **The buddy system:** Establish a buddy system and provide guidance on relevant issues including enforcement of water consumption; eating; personal hygiene; sunburn, fatigue, sickness, heat or cold injury; and swimming. Don't forget that leaders also need a buddy, because leaders frequently try to "tough-it-out" to remain in the action.

Carbon monoxide poisoning

Description: Carbon monoxide (CO) poisoning occurs when oxygen in the body is replaced by carbon monoxide. CO accumulates from inadequate ventilation from engines, stoves, heaters.

Symptoms:

- Headache
- Dizziness
- Weakness
- Excessive yawning
- Ringing in ears
- Confusion
- Nausea
- Bright red lips, eyelids
- Grayish tint in dark-skinned people
- Drowsiness
- Unconsciousness
- Possibly death

Prevention:

- Ensure proper ventilation
- Do not use unvented heaters or engines
- Use only Army approved heaters in sleeping areas and ensure proper training and service
- Turn heaters off when not needed (during sleep)
- If heater is kept on during sleep, post a fire guard
- Never sleep in vehicle with engine running
- Never wrap poncho around vehicle exhaust to collect heat

Treatment:

- Move to fresh air immediately.
- Seek medical aid promptly.
- Provide mouth-to-mouth resuscitation if victim is not breathing.

Heat injuries

A heat injury occurs when a Soldier engages in physical activity to the extent that heat production within the body exceeds the body's ability to lose heat adequately. This results in a rise in the inner body (core) temperature to levels that interfere with body functions and lead to temporary or permanent damage. Heat injuries can range from mild heat cramps, to more severe heat exhaustion, to life-threatening heat stroke.

(WARNING: When treating a heat casualty, continually monitor for development of conditions which may require basic lifesaving measures, such as: clearing the airway, performing mouth-to-mouth resuscitation, preventing shock, and/or controlling bleeding. **DO NOT** loosen the casualty's clothing if in a chemical environment.)

Heat cramps:**• Symptoms:**

- Muscle cramps of arms, legs, and/or stomach
- Heavy sweating and extreme thirst

• Treatment:

- If not in a chemical environment, move the casualty to a shady area or improvise shade and loosen his clothing.
- Give him large amounts of cool water slowly.
- Monitor the casualty and give him more water as tolerated.
- Seek medical aid if the cramps continue.

Heat exhaustion:**• Symptoms:**

- Weakness
- Exhaustion
- Headaches
- Dizziness
- Profuse sweating

- Pale, moist, cool skin
- Loss of appetite
- Heat cramps
- Nausea (with or without vomiting)
- Urge to defecate
- Chills (gooseflesh)
- Rapid breathing
- Confusion
- Tingling of the hands and/or feet

• **Treatment:**

- Move the casualty to a cool, shady area or improvise shade and loosen/remove his clothing.
- Pour water on him and fan him to permit coolant effect of evaporation.
- Have him slowly drink at least one canteen full of water.
- Elevate the casualty's legs.
- Seek medical aid if symptoms continue; monitor the casualty until the symptoms are gone or medical aid arrives.

Heat stroke:

• **Symptoms:**

- Body core temperature of 105° Fahrenheit (41° Celsius) and above
- Skin is red (flushed), hot, and dry
- May stop sweating
- May present with confusion, aggressive behavior, and may progress into a comatose state
- Altered mental status

(**Note:** Sweating is not an indication of a less serious heat injury. Soldiers who are sweating may still be experiencing heatstroke. Soldier may first experience headache, dizziness, nausea, fast pulse and respiration, seizures, and mental confusion. He may collapse and suddenly become unconscious. **HEAT STROKE IS A MEDICAL EMERGENCY.**)

- **Treatment:**

- Move the casualty to a cool, shady area or improvise shade and loosen or remove the outer garments and protective clothing if the situation permits.
- Start cooling the casualty immediately. Spray or pour water on him. Fan him. Massage his extremities and skin.
- Elevate his legs.
- If conscious, have him slowly drink at least one canteen full of water.
- Seek medical aid. Continue cooling while awaiting transport and during evacuation. Evacuate as soon as possible. Perform any necessary lifesaving measures.

(**Note:** Start cooling casualty immediately. Continue cooling while awaiting transportation and during the evacuation.)

- **Prevention:**

- Acclimatization:

Heat acclimatization occurs when repeated heat exposures are sufficiently stressful to elevate body temperature and provoke profuse sweating.

Resting in the heat with limited physical activity (doing only what is required for existence) results in only partial acclimatization. Physical exercise in the heat is required to achieve optimal heat acclimatization.

Generally, about two weeks of daily heat exposure is needed to induce heat acclimatization.

Acclimatization requires a minimum daily heat exposure of about two hours (can be broken into two 1-hour exposures).

Daily heat exposure needs to be combined with physical exercise that requires cardiovascular endurance, (for example, marching or jogging) rather than strength training (pushups and resistance training).

By the second day of acclimatization, significant reductions in physiologic strain are observed.

Soldiers who are less fit (APFT run times greater than 15 min) or unusually susceptible to heat may require several days or weeks to fully acclimatize. Physically fit Soldiers (APFT run times less than 14 min) should be able to achieve heat acclimatization in about a week. However, several weeks of living and working in the heat (seasoning) may be required to maximize tolerance to high body temperatures.

Gradually increase the exercise intensity or duration each day. Work up to an appropriate physical training schedule adapted to the required

physical activity level for the advanced military training and environment.

- ° Acclimatization strategies:

Maximize physical fitness and heat acclimatization prior to arriving in hot weather.

Maintain physical fitness after arrival with maintenance programs tailored to the environment, such as training runs in the cooler morning or evening hours.

Integrate training and heat acclimatization. Train in the coolest part of the day and acclimatize in the heat of the day.

Start slowly by reducing training intensity and duration (compared to what you could achieve in temperate climates).

Increase training and heat exposure volume as your heat tolerance permits.

Use interval training (work/rest cycles) to modify your activity level.

If the new climate is much hotter than what you are accustomed to, recreational activities may be appropriate for the first two days with periods of running/walking. By the third day, you should be able to integrate PT runs (20 to 40 min) at a reduced pace.

Consume sufficient water to replace sweat losses. Sweating rates of greater than one quart per hour are common. Heat acclimatization increases the sweating rate and, therefore, increases water requirements. As a result, heat acclimatized Soldiers will dehydrate faster if they do not consume fluids. Dehydration negates many of the thermoregulatory advantages conferred by heat acclimatization and high physical fitness.

Do not skip meals. Food will replace the minerals lost in sweat as well as provide the needed calories. Salt food to taste, and do not take salt tablets.

Caffeine and alcohol beverages have diuretic properties that increase the risk of dehydration through increased urination. Heat, wind, and dry air increase the body's water requirements through loss of body water as sweat.

- ° Diet:

A balanced diet usually provides enough salt even in hot weather. DO NOT use salt tablets to supplement a diet.

Anyone on a special diet (for whatever purpose) should obtain professional help to work out a properly balanced diet.

MREs and Army prepared meals provide the Soldier with required nutrients for sustainment, if all meals are eaten!

◦ Clothing:

The type and amount of clothing and equipment a Soldier wears and the way he wears it affects the body and its adjustment to the environment. Clothing protects the body from radiant heat.

Excessive or tight-fitting clothing, web equipment, and packs reduce ventilation needed to cool the body. During halts, rest stops, and other periods when such items are not needed, they should be removed, mission permitting.

The individual protective equipment (IPE) protects the Soldier from chemical and biological agents. The equipment provides a barrier between him and a toxic environment. However, a serious problem associated with the chemical overgarment is heat stress. The body normally maintains a heat balance, but when the overgarment is worn, the body sometimes does not function properly. Overheating may occur rapidly. Be on high alert for heat injuries while in mission-oriented protective posture (MOPP) or joint service lightweight integrated suit technology (JLIST) gear. Hydration must be ensured and shift work should be a top priority.

Cold injuries

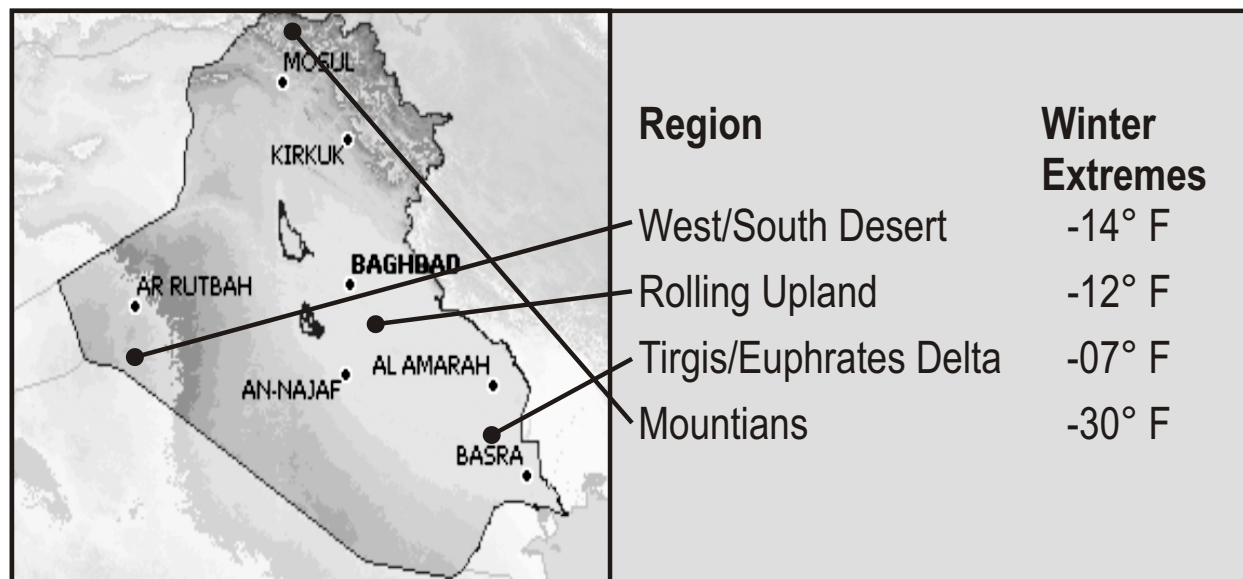


Figure 11

Description: Generally, Iraq is not a high risk country for cold weather injuries; however, risks are high in cold, northern mountainous regions, during nights with low temperatures, and in wet conditions. Statistically, the typical cold weather injury casualty

is a male approximately 20 years old at the rank of E-4 or below. He is usually from a warm climate and is not experienced in dealing with cold weather and not prepared to survive in cold weather conditions. Soldiers who use alcohol, tobacco/nicotine, or medication could have impaired judgment and miss early warning signs of cold injuries.

Anyone can get a cold weather injury if the conditions are right. However, some Soldiers are more susceptible than others. Soldiers who have had a cold injury in the past are much more likely to develop a cold injury sooner or a more severe cold injury in the future.

Adequate nutrition is required to fuel your body's metabolism to produce heat. Generally 3600-4600 calories per day is sufficient. More calories are required when working in a cold environment than when in garrison. Dehydration will cause the body's natural defense mechanisms to fail and cause the Soldier to be much more susceptible to cold injuries, especially hypothermia. Over-activity can lead to sweating and wet clothing that can create conditions for immersion syndrome or hypothermia. Under-activity can lead to decreased body heat production. Sick or injured individuals will have lowered defense mechanisms and might also be slower to recognize cold injury symptoms due to existing injuries.

Prevention:

- Dress properly
- Drink plenty of fluids
- Eat right
- Do not smoke or drink alcohol
- Stay in shape
- Get plenty of rest
- Minimize periods of inactivity
- Maintain a positive attitude
- Use heaters correctly
- Use the buddy system

Trenchfoot

Description: Trenchfoot is a very serious injury that may result in permanent nerve or tissue damage. Constant dampness softens skin, causes blistering or bleeding and may lead to infection. Untreated, trenchfoot may require amputation.

Symptoms: Early signs of trenchfoot include itching, numbness, or tingling pain. Later the feet may appear swollen and the skin mildly red, blue, or black. Commonly, trenchfoot shows a distinct "water-line" coinciding with the water level in the boot. Trench foot (immersion foot) results from prolonged exposure to wet, cold conditions or the outright immersion of the feet in water with a temperature usually below 50°F but

above freezing. At the upper range of temperatures, exposure of 12 hours or more will cause injury. Shorter duration at or near 32° F will cause the same injury. A trench foot injury is usually associated with immobilization of the feet.

Treatment: Treatment is required for all stages of immersion syndrome injury.

- Warm the injured part gradually by exposing it to warm air. (**Note:** When the part is rewarmed, the casualty often feels a burning sensation and pain. Symptoms may persist for days or weeks even after warming.)
- DO NOT massage it.
- DO NOT moisten the skin.
- DO NOT apply heat or ice.
- DO NOT pop blisters, apply lotions, or cream.
- DO NOT allow victim to walk on injury.
- Protect it from trauma and secondary infections.
- Dry, loose clothing or several layers of warm coverings are preferable to extreme heat.
- Under no circumstances should the injured part be exposed to an open fire.
- Elevate the injured part to relieve the swelling.
- Evacuate the casualty to a medical treatment facility as soon as possible.

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

Snake and insect bites

Snake bites, if not treated promptly and correctly, can cause serious illness or death. The severity of snakebite depends on whether the snake is poisonous or nonpoisonous, the type of snake, the location of the bite and the amount of venom injected. Knowledge and prompt application of first aid measures can lessen the severity of injuries from bites and keep the Soldier from becoming a serious casualty.

Nonpoisonous snakes

There are approximately 130 different varieties of nonpoisonous snakes. They have oval-shaped heads and round eyes. Unlike poisonous snakes, discussed below, nonpoisonous snakes do not have fangs with which to inject venom. See Figure 6-1 for characteristics of a nonpoisonous snake. If only minimal swelling occurs within 30 minutes, the bite will almost certainly have been from a nonpoisonous snake or possibly, from a poisonous snake, which did not inject venom.

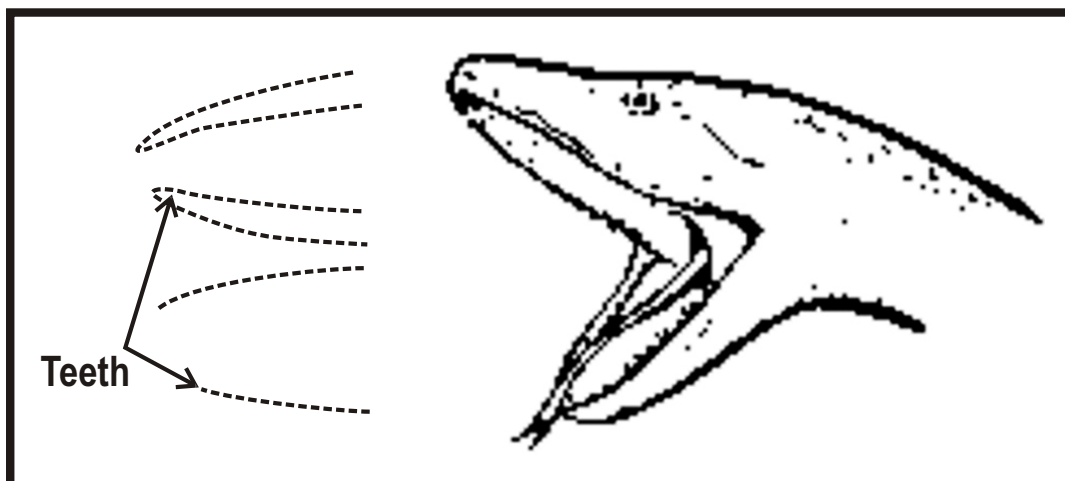


Figure 12: Characteristics of nonpoisonous snakes

Poisonous snakes

Poisonous snakes are found throughout the world, primarily in tropical to moderate climates. Within the United States, there are four kinds: rattlesnakes, copperheads, water moccasins (cottonmouth), and coral snakes. Poisonous snakes in other parts of the world include sea snakes, the fer-de-lance, the bushmaster, and the tropical rattlesnake in tropical Central America; the Malayan pit viper in the tropical Far East; the cobra in Africa and Asia; the mamba (or black mamba) in Central and Southern Africa; and the krait in India and Southeast Asia.

- Pit vipers (poisonous) include rattlesnakes, bushmasters, copperheads, fer-de-lance, Malayan pit vipers, and water moccasins (cottonmouth). Pit viper venoms (hemotoxins) destroy tissue and blood cells.
 - Pit vipers have the following characteristics:
 - Small, deep pits between the nostrils and eyes on each side of the head.
 - Long, hollow fangs, thick bodies, slit-like pupils, and flat, almost triangular-shaped heads.
 - Color markings and other identifying characteristics, such as rattles or a noticeable white interior of the mouth (cottonmouth), also help distinguish these poisonous snakes.
 - Further identification is provided by examining the bite pattern of the wound for signs of fang entry. Occasionally there will be only one fang mark, as in the case of a bite on a finger or toe where there is no room for both fangs or when the snake has broken off a fang.
 - Pit viper bites are characterized by the following symptoms:

Severe burning pain

Discoloration and swelling around the fang marks (usually begins within 5 to 10 minutes after the bite). The venom destroys blood cells, causing a general discoloration of the skin.

Blisters and numbness in the affected area.

Weakness, rapid pulse, nausea, shortness of breath, vomiting, and shock.

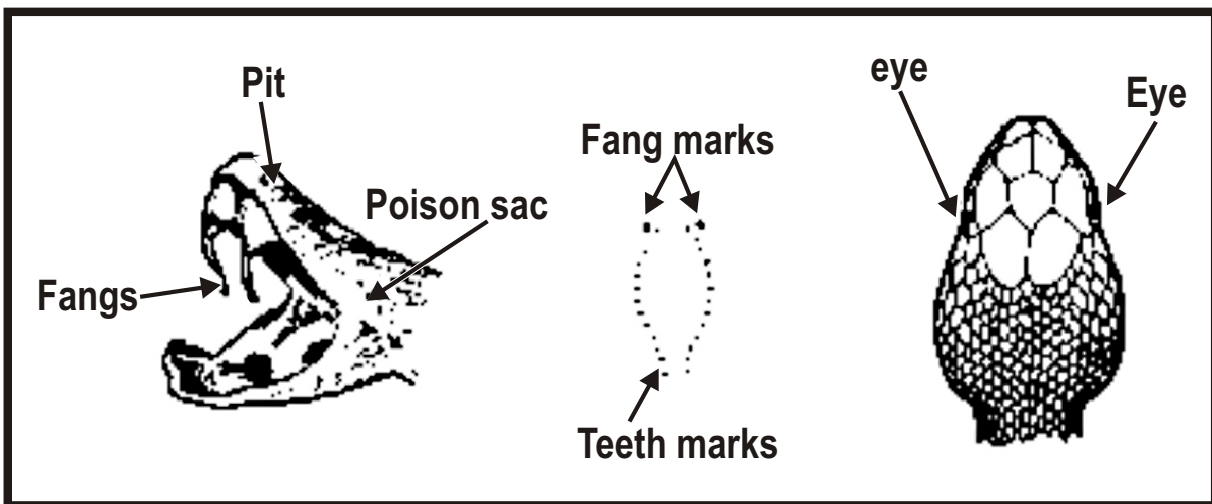


Figure 13: Characteristics of poisonous snakes



Figure 14: Fer de lance



Figure 15: Malayan pit viper



Figure 16: Bushmaster



Figure 17: Tropical rattlesnake

- Corals, cobra, kraits, and mambas all belong to the same group of poisonous snakes even though they are found in different parts of the world. Cobras, adders, and coral snakes inject powerful venoms (neurotoxins) which affect the central nervous system, causing respiratory paralysis.
 - The following are characteristics of this group of poisonous snakes:

All four inject their venom through short grooved fangs, leaving a characteristic bite pattern.

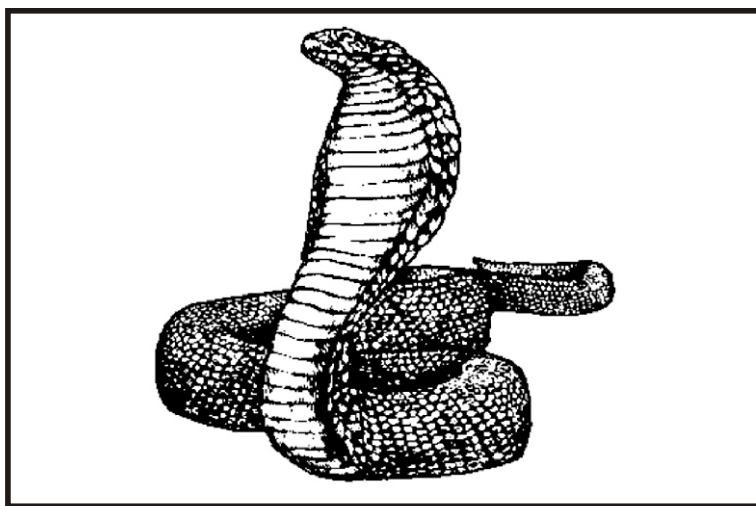


Figure 18: King cobra

Color markings and other identifying characteristics also help distinguish these poisonous snakes. The small coral snake, found in the Southeastern United States, is brightly colored with bands of red, yellow (or almost white), and black completely encircling the body. (**Note:** Other nonpoisonous snakes have the same coloring, but on the coral snake found in the United States, the red ring always touches the yellow ring. To know the difference between a harmless snake and the coral snake found in the United States, remember the following: “Red on yellow will kill a fellow, Red on black, venom will lack.”)



Figure 19: Coral snake



Figure 20: King snake (nonpoisonous snake that resembles the coral snake)

- ° The venom of corals, cobras, kraits, and mambas produces symptoms different from those of pit vipers. Minimal pain and swelling may cause many people to believe that the bite is not serious. Delayed reactions in the nervous system normally occur between 1 to 7 hours after the bite. Symptoms include the following:

Blurred vision

Drooping eyelids

Slurred speech

Drowsiness

Increased salivation and sweating

Nausea, vomiting, shock, respiratory difficulty, paralysis, convulsions, and coma will usually develop if the bite is not treated promptly.



Figure 21: Sea snake

- Sea snakes are found in the warm water areas of the Pacific and Indian oceans, along the coasts, and at the mouths of some larger rivers. Their venom is VERY poisonous, but their fangs are only $\frac{1}{4}$ inch long. The first aid outlined for land snakes also applies to sea snakes. Water moccasins and sea snakes have venom that is both hemotoxic and neurotoxic.

Snake bites

If a Soldier should accidentally step on or otherwise disturb a snake, it will attempt to strike. Chances of this happening while traveling along trails or waterways are remote if a Soldier is alert and careful. Poisonous snakes DO NOT always inject venom when they bite or strike a person. However, all snakes may carry tetanus (lockjaw); anyone bitten by a snake, whether poisonous or nonpoisonous, should immediately seek medical attention.

In the event you are bitten, attempt to identify and/or kill the snake. The identification of poisonous snakes is very important since medical treatment will be different for each type of venom. Unless it can be positively identified, the snake should be killed and saved. When this is not possible or when doing so is a serious threat to others, identification may sometimes be difficult since many venomous snakes resemble harmless varieties. When dealing with snakebite problems in foreign countries, seek advice, professional or otherwise, that may help identify species in the particular area of operations. Take the snake to medical personnel for inspection/identification. **TREAT ALL SNAKE BITES AS POISONOUS.**

Treatment:

- Get the casualty to a medical treatment facility as soon as possible and with minimum movement. Until evacuation or treatment is possible, have the casualty lie quietly and not move any more than necessary.
- Remove rings, watches, or other jewelry from the affected limb.

- When possible, clean the area of the bite with soap and water. DO NOT use ointments of any kind.
- The casualty should not smoke, eat, or drink any fluids.
- If the casualty has been bitten on an extremity, DO NOT elevate the limb; keep the extremity level with the body. Keep the casualty comfortable and reassure him.
 - If the bite is on an arm or leg, place a constricting band (narrow cravat [swathe], or narrow gauze bandage) one to two finger breadths above and below the bite (**Figure 22**).
 - If only one constricting band is available, place that band on the extremity between the bite site and casualty's heart.
 - If the bite is on the hand or foot, place a single band above the wrist or ankle. The band should be tight enough to stop the flow of blood near the skin, but not tight enough to interfere with circulation. In other words, it should not have a tourniquet-like effect.
 - If no swelling is seen, place the bands about 1 inch from either side of the bite.
 - If swelling is present, put the bands at the edge of the swelling.
 - If the swelling extends beyond the band, move the band to the new edge of the swelling. (If possible, leave the old band on, place a new one at the new edge of the swelling, and then remove and save the old one in case the process has to be repeated.)
 - If possible, place an ice bag over the area of the bite. DO NOT wrap the limb in ice or put ice directly on the skin. Cool the bite area—do not freeze it. DO NOT stop to look for ice if it will delay evacuation and medical treatment.
- If the casualty is alone when bitten, he should go to the medical facility himself rather than wait for someone to find him.
- Unless the snake has been positively identified, attempt to kill it and send it with the casualty. Be sure that retrieving the snake does not endanger anyone or delay transporting the casualty.

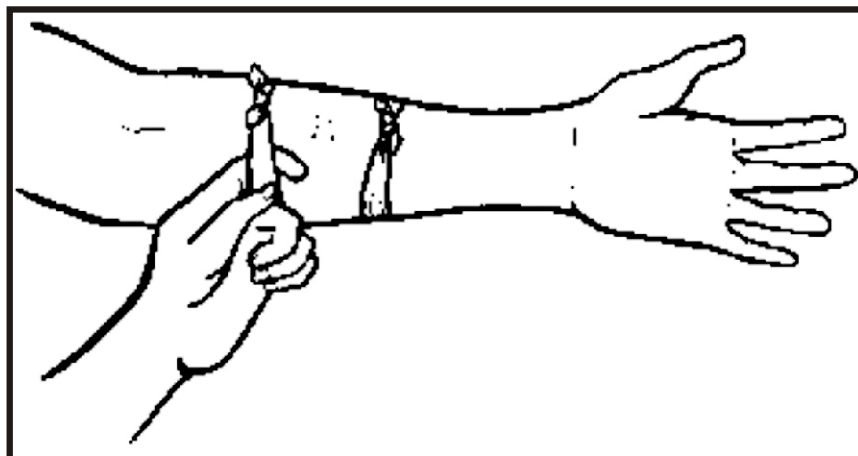


Figure 22

CAUTION: DO NOT attempt to cut open the bite or suck out the venom. If the venom should seep through any damaged or lacerated tissues in your mouth, you could immediately lose consciousness or even die.

CAUTION: When a splint is used to immobilize the arm or leg, take EXTREME care to ensure the splinting is done properly and does not bind. Watch it closely and adjust it if any changes in swelling occur.

(Note: It may be possible, in some cases, for a medic who is specially trained and is authorized to carry and use antivenin to administer it. The use of antivenin presents special risks, and only those with specialized training should attempt to use it!)

Prevention: Except for a few species, snakes tend to be shy or passive. Unless they are injured, trapped, or disturbed, snakes usually avoid contact with humans. The harmless species are often more prone to attack. All species of snakes are usually aggressive during their breeding season.

- Do not handle, play with, or disturb snakes or other wildlife.
- Avoid swimming in areas where snakes abound.
- Keep hands off rock ledges where snakes may be hiding or sunning.
- Look over the area before sitting down, especially if in deep grass or among rocks.
- If snakes are known to inhabit the area, sleep off the ground, if possible.
- If military situation permits, avoid walking about an area during the period from dusk to complete daylight, as many snakes are active during this period.
- Avoid camping near piles of brush, rocks, or other debris.
- Never step over large rocks or logs without first checking to see what is on the other side.

- Turn rocks and logs toward you when they have to be removed so you will be shielded should snakes be beneath them.
- Handle freshly killed snakes only with a long-handled tool or stick; snakes can still inflict fatal bites by reflex action after their death.

(Note: If bitten, try to kill the snake and bring its head with you to the medical treatment facility. If you cannot bring the snake's head with you, get an accurate description of the snake to assist medical personnel in treating you. **DO NOT** panic!)

WARNING: All species of snakes can swim. Many can remain under water for long periods. A bite sustained in water is just as dangerous as one on land.

Insect bites/stings

An insect bite or sting can cause great pain, allergic reaction, inflammation, and infection. If not treated correctly, some bites/stings may cause serious illness or even death. When an allergic reaction is not involved, first aid is a simple process. In any case, medical personnel should examine the casualty at the earliest possible time. It is important to properly identify the spider, bee, or creature that caused the bite/sting especially in cases of allergic reaction when death is a possibility.

Types of insects: The insects found throughout the world that can produce a bite or sting are too numerous to mention in detail. Commonly encountered stinging or biting insects include brown recluse spiders, black widow spiders, tarantulas, scorpions, urticating caterpillars, bees, wasps, centipedes, conenose beetles (kissing bugs), ants, and wheel bugs. Upon being reassigned, especially to overseas areas, take the time to become acquainted with the types of insects to avoid.



Figure 23: Black widow spider



Figure 24: Scorpion



Figure 25: Brown Recluse Spider



Figure 26: Tarantula

Prevention:

- Remove spiders from tents or buildings.
- Shake out and inspect clothing, shoes, and bedding before use.
- Eliminate collections of papers, unused boxes, scrap lumber, and metal.
- Thoroughly clean beneath and behind large items; spiders and scorpions may be resting in these areas.
- Check field latrines before use; run a small stick under the rim of the latrine hole to dislodge any spiders or scorpions there. Spiders and scorpions may rest under toilet seat or inside latrine box.
- Wear gloves when handling paper, cloth, lumber, or other items that have been stored for long periods.
- Check around rocks and logs before resting against them.
- Use a long-handled tool or stick to turn over debris before removing it.
- Remove accumulations of boards, rocks, and other debris to eliminate the resting/hiding areas of spiders and scorpions.
- Wear leather gloves to remove rocks, lumber, and such from the ground.
- Apply insect repellent to all exposed skin, such as the ankles, to prevent insects from creeping between uniform and boots. Also, apply the insect repellent to the shoulder

blades where the shirt fits tight enough that mosquitoes bite through. DO NOT apply insect repellent to the eyes.

- Reapply repellent every 2 hours during strenuous activity and soon after stream crossings.
- Blouse the uniform inside the boots to further reduce risk.
- Wash yourself daily if the tactical situation permits. Pay particular attention to the groin and armpits.
- Use the buddy system. Check each other for insect bites.
- Wash your uniform at least weekly.

(**Note:** In many locations worldwide, centipedes are more of a problem than scorpions, but the protective measures are the same for both pests.)

Symptoms:

- Commonly seen less serious symptoms are pain, irritation, swelling, heat, redness, itching, hives, or wheals (raised areas of the skin that itch). Symptoms are usually dangerous only if they affect the air passages (mouth, throat, nose, and so forth), which could interfere with breathing. The bites/stings of bees, wasps, ants, mosquitoes, fleas, and ticks are usually not serious and normally produce mild and localized symptoms. A tarantula's bite is usually no worse than that of a bee sting. Most scorpions (except for a specific species found only in the Southwest desert) inflict a painful but not serious bite.
- Serious allergic or hypersensitive reactions sometimes result from insect bites. Many people are allergic to the venom of bees, wasps, and ants.
 - Bites or stings from these insects may produce more serious reactions, to include generalized itching and hives, weakness, anxiety, headache, breathing difficulties, nausea, vomiting, and diarrhea.
 - Very serious allergic reactions (called anaphylactic shock) can lead to complete collapse, shock, and even death.
- Spider bites (particularly from the black widow and brown recluse spiders) can be serious also.
 - Venom from the black widow spider affects the nervous system. This venom can cause muscle cramps, a rigid, non tender abdomen, breathing difficulties, sweating, nausea, and vomiting.
 - The brown recluse spider generally produces local rather than system-wide problems; however, local tissue damage around the bite can be severe and can lead to an ulcer and even gangrene.

Treatment: There are certain principles that apply regardless of what caused the bite/sting:

- If there is a stinger present remove it by scraping the skin's surface with a fingernail or knife. DO NOT squeeze the sac attached to the stinger because it may inject more venom.
- Wash the area of the bite/sting with soap and water (alcohol or an antiseptic may also be used) to help reduce the chances of an infection and remove traces of venom.
- Remove jewelry from bitten extremities because swelling is common and may occur.
- In most cases of insect bites the reaction will be mild and localized. Using cold compresses (if available) on the site of the bite/sting will help reduce swelling, ease the pain, and slow the absorption of venom. Do not apply ice directly to bare skin. The intent is to keep the bite cool, not freeze it.
- Meat tenderizer (to neutralize the venom) or calamine lotion (to reduce itching) may be applied locally.
- In more serious reactions (severe and rapid swelling, allergic symptoms, and so forth) treat the bite/sting like you would treat a snake bite; that is, apply constricting bands above and below the site.
- Be prepared to perform basic lifesaving measures, such as rescue breathing.
- Reassure the casualty and keep him calm. In serious reactions, attempt to capture the insect for positive identification; however, be careful not to become a casualty yourself.
- If the reaction appears serious, seek medical aid immediately.

CAUTION: Insect bites/stings may cause anaphylactic shock (a shock caused by a severe allergic reaction). This is a life-threatening event and a **MEDICAL EMERGENCY!** Be prepared 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 treatment kits. 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.)

Acute mountain sickness (AMS)

AMS is a spectrum of diseases occurring at high altitudes. Elevations below about 2,500 m (8,000 ft) rarely are associated with AMS. Any elevation above 2,500 m is considered high altitude and AMS may occur.

Iraq:

- Lowest point: Persian Gulf 0 m
- Highest point: Haji Ibrahim 3,600 m

Afghanistan:

- Lowest point: Amu Darya 258 m
- Highest point: Nowshak 7,485 m

Description: Acclimatization is the process during which the body adjusts to the decreasing availability of oxygen. The following normal body changes occur in every person who goes to high altitudes:

- Hyperventilation (breathing fast)
- Shortness of breath during exertion
- Increased urination
- Changed breathing pattern and frequent awakening at night

When acclimatization lags significantly behind ascent, various symptoms occur. AMS represents the body's intolerance of the hypoxic (low oxygen) environment at one's current elevation. Anyone who goes to high altitudes can become ill. It is primarily related to rate of ascent. No way has been found to predict who is likely to get sick. AMS is a spectrum of illness, from mild to life threatening.

Symptoms: If you can recognize the symptoms, you should be able to avoid severe, potentially life-threatening illness. Dehydration is a common cause of headache at high altitudes. However, if a headache persists after drinking plenty of fluids and taking an analgesic (acetaminophen, aspirin, or ibuprofen), it is critical to consider AMS. In the context of a recent ascent, a headache with any one or more of the following symptoms above 2,500 m (8,000 ft) qualifies you for AMS:

- Headache (most intense at night and shortly after arising in the morning)
- Nausea
- Vomiting
- Dizziness
- Fatigue
- Irritability
- Coughing

Universal susceptibility exists among those not acclimatized regardless of fitness. Symptom onset is 3-24 hours after rapid (less than 24 hours) ascent above 6,000 ft (1,829 m). Severity peaks at 24-72 hours and usually subsides over the course of 3-7 days. AMS can reoccur after acclimatization with rapid ascent to higher altitude.

Prevention: The key to avoiding AMS is a rational ascent that gives your body time to acclimatize. People acclimatize at different rates, but in general, at altitudes above 3,000 meters (10,000 feet) your sleeping elevation should not increase more than 300 meters

(1,000 feet) per night, and every 1,000 meters (3,000 feet) you should spend a second night at the same elevation. It is a slow process, taking place over a period of days. Remember the adage: “Climb high and sleep low.” Meaning you should not sleep at the highest elevation you climbed that day. There are medications that can prevent AMS. Check with your medical provider if these are appropriate for you. These medications include diamox (acetazolamide) and steroids such as prednisone or decadron. Finally, it is important to remember that it is always possible to descend; you will start feeling better faster.

Treatment:

- Seek medical attention immediately if you experience any of the above symptoms.
- **DO NOT ASCEND ANY HIGHER.** This is extremely important. Even a day hike to a higher elevation is a risk. Descend at once, at least to the elevation where you last felt well when you woke up.
- Never leave someone with AMS alone. They may need help descending or may not recognize that they are getting sicker.
- The mainstay of treatment for AMS is descent, rest, fluids, and mild, pain medicine.

Hearing loss

Exposure to loud noise destroys the hair cells in the inner ear. Once destroyed the hair cells cannot be replaced. Destroyed hair cells equate to loss of hearing. The loss of inner ear hair cells can also result in a loss of lateral inhibition whereby surviving adjacent hair cells and nerve endings are no longer “controlled” by the missing hair cells and fire spontaneously. This is one explanation for an accompanying condition to a noise-induced hearing loss called tinnitus, a constant ringing in the ears which can be more debilitating and annoying than the hearing loss itself.

Hearing loss due to noise exposure is progressive. It occurs over a long period of time and is called noise induced hearing loss. Loss of hearing due to noise exposure is painless. By the time hearing loss is noticed, the damage has been done. Hearing that is lost cannot be regained. Unprotected exposure to noise over time may also lead to other health problems such as high blood pressure and an increased anxiety level.

Hearing loss due to noise exposure can also occur as a result of a one time very loud, very short duration noise such as weapon discharge. Hearing loss of this nature is called acoustic trauma. Acoustic trauma may permanently damage the inner, middle, and/or outer ear instantaneously.

It is essential that you use properly fitted hearing protection during military operations. Exposure to high-intensity noise may cause hearing loss that can adversely affect your combat effectiveness and individual readiness. Good hearing is essential to mission success. If you are a dismounted Soldier, the combat arms earplugs (NSN 6515-01-466-2710) will protect you from the impact noise of weapons fire while only slightly interfering with voice communications and detection of combat sounds such as vehicle noise, footfalls in leaves, and the closing of a rifle bolt.

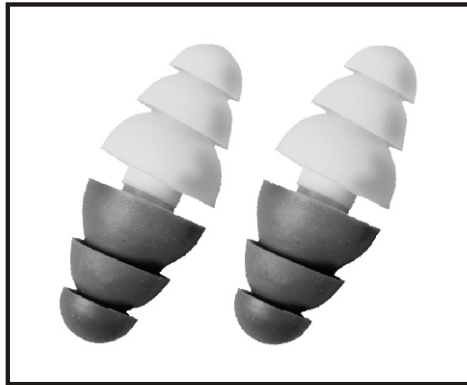


Figure 27

While not as effective as the combat arms earplug in preserving your ability to hear important mission-related sounds, noise muffs or standard earplugs are very effective at preventing noise-induced injury. If you are a member of vehicle or helicopter crews, your combat vehicle crew or aircrew helmets have built-in hearing protectors.

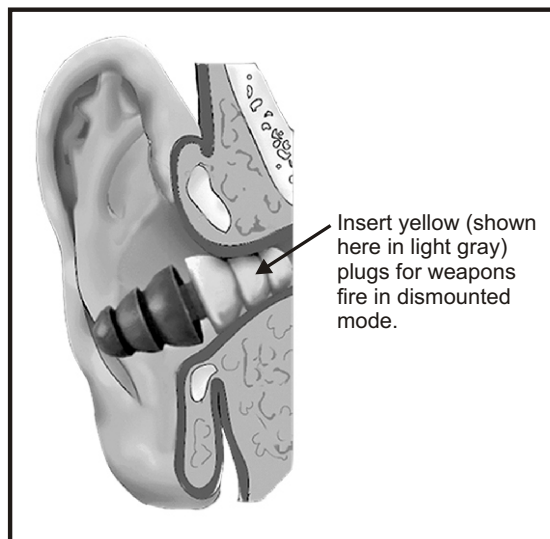


Figure 28

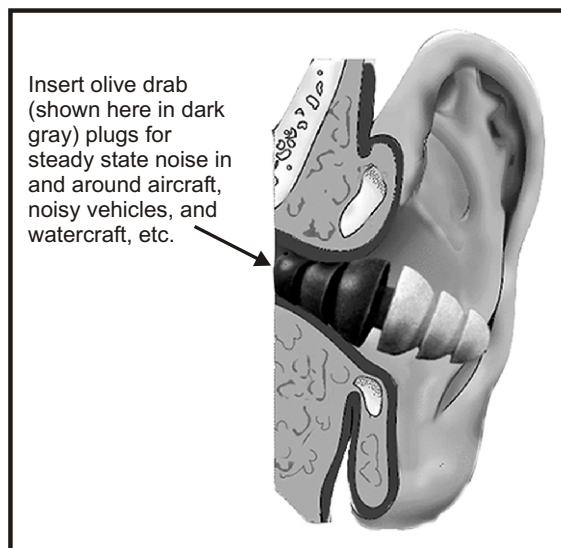


Figure 29

In addition, the Communication Enhancement and Protection System (CEPS) (NSN 5965-01-488-4332) provides hearing protection while allowing communication as normal. Some call it a “whisper system” and others are familiar with this system on ranges. It allows the user to increase or decrease the ability to have voice communication while providing hearing protection. (**Note:** During OIF, virtually all victims of IED had some hearing loss if no hearing protection was worn.)

Eye injury

Eye injury rates in wars have been increasing over the last 150 years. It has gone from 0.57% in the Civil War to 13% in Operation DESERT SHIELD/DESERT STORM.

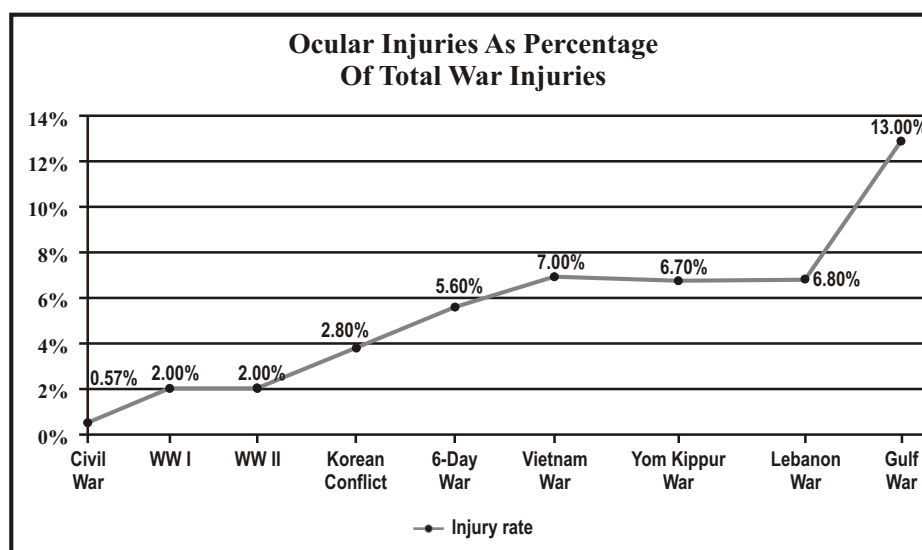


Figure 30

Factors contributing to the increased percentage of battlefield eye injuries include following:

- Increased efficiency of modern munitions with fragmentation capability
- Tank warfare (tank crews' upper body, face, and eyes have increased exposure to injury); sun, wind and dust goggles are frequently not worn.
- Battle tactics (static defensive battle fronts account for increased battlefield eye injuries)
- Environment (in Operation DESERT STORM, many eye injury complaints were related to desert conditions)

The increased numbers of non-battle related and accidental battlefield eye injuries is the result of increased motorization and mechanization of armies. Non-battle injury rates have been observed to be highest when battle intensity is at its highest.

Protection against battlefield eye injuries comes from the ballistic protection of polycarbonate lens material combined with absorbing dye coating laser protective technology. Ballistic laser protective spectacles (BLPS), Special Protective Eyewear Cylindrical System (SPECS), and sun, wind, and dust (SWD) goggles are the military applications of safety eye wear. Military units may order BLPS and SPECS through normal requisitioning channels.

Military eye protection NSNs:

- Spectacles kit, ballistic protective: Contains a clear ballistic protective spectacle, a natural gray ballistic lens, a retaining strap, extra temple pieces, all in a hard carrying belt case. For use by those who do not require vision corrective lenses.



Figure 31

8465-01-416-4626	\$14.65	Kit (SPECS) Regular
8465-01-416-4629	\$14.65	Kit (SPECS) Large
8465-01-416-4628	\$10.00	Class 1, clear, (SPECS) Regular
8465-01-416-4631	\$10.00	Class 1, clear, (SPECS) Large
8465-01-416-4630	\$10.00	Class 2, gray, (SPECS) Regular
8465-01-416-4633	\$10.00	Class 2, gray, (SPECS) Large
8465-01-416-4634	\$18.30	Class 3, 2 w lp, (SPECS) Regular
8465-01-416-4632	\$18.30	Class 3, 2 w lp, (SPECS) Large
8465-01-416-4635	\$19.75	Class 4, 3 w lp, (SPECS) Regular
8465-01-416-8516	\$19.75	Class 4, 3 w lp, (SPECS) Large
8465-01-416-4627	\$3.45	Case, SPECS



Figure 32

- Spectacles, protective, laser, ballistic (BLPS): Below classes are one size fits all and include a retaining strap and carrying belt case. Compatible with military prescription lens carrier.

8465-01-416-4636	\$16.25	Class 1, clear, (BLPS)
8465-01-417-4004	\$16.10	Class 2, gray, (BLPS)
8465-01-416-3207	\$28.70	Class 3, 2 w lp, (BLPS)
8465-01-416-3210	\$40.75	Class 4, 3 w lp, (BLPS)
8465-01-417-9963	\$3.45	Case, BLPS

- Goggles, sun, wind, and dust



Figure 33

8465-01-109-3997	\$2.90	Class 3 lens, clear (SWDG)
8465-01-109-3996	\$3.00	Class 4 lens, gray (SWDG)
8465-01-439-3506	\$16.55	Class 5 lens, 2w lp (SWDG)
8465-01-439-3511	\$39.45	Class 6 lens, 3w lp (SWDG)
8465-01-328-8268	\$13.35	SWDG assembly (frame with cl 3 and cl 4 lenses)

- Recently, a number of commercial products have been acquired by the Army under the rapid fielding initiative (RFI). The NSNs of these additional items of eye protection are provided below. Some commercial eye protections with NSNs:

(Note: This is not an endorsement of any one product. These products have received a significant amount of positive feedback when they were included in the rapid fielding initiative for OEF and OIF.)



Figure 34: Eye Safety Systems Military Profile Series Goggle

Brand Name	Model	NSN
ESS Profile NVG, tactical black	EP01BK1-T	4240-01-505-0049
ESS Profile black, w/stealth sleeve	EP01BK1-TSB	4240-01-504-6222
ESS Profile NVG, desert tan	EP01DT1-M	4240-01-509-2993
ESS Profile, tan, w/stealth sleeve	EP01DT1-MSB	4240-01-504-5727
ESS Profile, NVG, olive drab	EP01OD1-M	4240-01-509-2996
ESS Profile, olive, w/stealth sleeve	EP01OD1-MSB	4240-01-504-5706



Figure 35: Eye Safety Systems Land Ops Goggle Series

Brand Name	Model	NSN
Land ops goggle	ESS01OV-ML	4240-01-479-8657
Land ops w/stealth sleeve	ESS01OV-MLS5	4240-01-504-0052



Figure 36: Wiley X Eyewear SG-1 Series

Brand Name	Model	NSN
Wiley X	SG-1 full system	4240-01-504-0994
SG-1 goggle components:	SG-1 clear lenses	4240-01-504-5326
	SG-1G green smoke lenses	4240-01-504-5312
	SG-1E elastic strap	4240-01-504-5754
	SG-1F replacement frame	4240-01-504-6524
	SG-1T replacement temples	4240-01-504-6474



Figure 37: Wiley X Eyewear XL-1 Series

Brand Name	Model	NSN
Wiley X	XL-1 full system	4240-01-504-1037
XL-1 goggle components:	XLC clear lenses	4240-01-504-5303
	XLS smoke green lenses	4240-01-504-5308
	XLE elastic strap	4240-01-504-5770
	XLF replacement frame	4240-01-504-6528

SECTION C: INDIVIDUAL LESSONS LEARNED

Issue: Animal flea and tick collars

Discussion: Numerous national news media reports indicate that well-meaning citizens or citizen groups are sending animal flea and tick collars to our troops to be worn in the Iraqi theater of operations. They suggest that these collars can be worn by Soldiers for protection from such annoyances as “sand fleas.”



Figure 38: The result of wearing animal flea and tick collars on the outside of uniforms

Animal flea and tick collars contain a wide variety of pesticides that can be absorbed into the skin in toxic amounts. These pesticides include carbamates (carbaryl, propoxur), organophosphates (tetrachlorvinphos), insect growth regulators (methoprene), and formamidines (amitraz). They may cause severe skin reactions and have the potential to cause systemic poisoning.

Sweat secreted from glands through pores in the skin can leach out large quantities of pesticides and possibly other chemical ingredients from flea and tick collars. This sudden, massive dose of pesticides can result in direct skin damage (like the burns seen in the photograph above) or possible internal damage due to absorption of those pesticides back through the skin's pores. Sweat can even draw pesticides from flea and tick collars right through fabrics, so wearing collars on the outside of pants or socks is not a safe practice. The same goes for canvas desert boots.

Flea and tick collars are not as hazardous for dogs and cats because these animals do not sweat. This is why they must pant to cool off. Even so, flea and tick collars can even be harmful to animals if not used in strict accordance with label directions and precautions.

It is not surprising that animal flea and tick collars are not registered for human use by either the Environmental Protection Agency (EPA) or the Food and Drug Administration (FDA). It is therefore against the law to use such pesticide devices in a manner that is inconsistent with the label instructions.

In addition, there is no evidence that wearing flea and tick collars in any manner is useful in preventing attack of humans by disease-bearing or nuisance insects.

Recommendation: Use all three steps of the DOD Insect Repellent System. This is a most effective system when properly applied. Additionally, the “perceived” effectiveness of wearing a flea/tick collar around the pant leg is that securing the pant leg closed with the flea/tick collar simply prevents access of the biting insects (sand fleas, a colloquial term generally referring to biting midges, gnats, or other types of tiny flies) to the skin. Keeping pants tucked firmly down into the boots with the blousing cords drawn tight, will afford the same protective effect. Permethrin on the uniform fabric kills most insects (and other arthropods such as ticks) upon contact and is the most important means of protection.

Issue: Failure to treat uniforms with permethrin

Discussion: Sand flies (with leishmaniasis) and mosquitoes are a problem. Permethrin IDA kit treatment of uniforms was not ensured prior to deployment due to last minute issue of uniforms and IDA kits.

Recommendations: Treat all uniforms (IDA kits) and mosquito nets (aerosol cans) with permethrin. Ensure all field sanitation kits are to standard with updated supplies stocked for at least 60 days in an unimproved area.

(**Note:** Most Soldiers get bitten by sand flies on exposed skin areas while sleeping. Sand flies are weak fliers; a fan blowing over a sleeping Soldier may reduce bites. This is not an acceptable substitute for a mosquito bed net but may provide additional protection or be useful when nets are not available.)

Issue: Units are not disciplined to practice PMM.

Discussion: PMM in some unit areas were not accomplished to standard. In some cases there was a large amount of standing water. Garbage was not disposed of, attracting vermin and snakes. Hand washing facilities were not established. In one case, a large number of Soldiers came down with gastrointestinal problems.

Recommendation: Ensure all personnel practice good PMM to ensure their own health and the health of their fellow Soldiers. Aggressive inspections by preventive medicine detachments, field sanitation teams, and leaders to enforce the standards will ensure proper PMM are conducted.

Issue: Local ice procurement

Discussion: In an attempt to provide cool water, many units will procure ice from local sources. Although procuring ice will increase the palatability of the fluids, increase local interactions, and stimulate the local economy, local sources may not be approved.

Recommendations: Every effort should be made to have preventive medicine approve the source. If the source is not approved, the following recommendations must be made:

- Use the ice only for external cooling and not for consuming.
- Be sure to wipe off all containers prior to drinking.
- Consider pouring the cooled beverage into a separate container.

Issue: Too much fluid without salt replacement

Discussion: In an attempt to stay hydrated Soldiers often drink just water. Without maintaining a proper diet (often due to operational requirements) Soldiers are not getting the necessary electrolyte replacements. In some sustained operations, adequate mealtime may be delayed. High levels of water replacement without electrolytes can cause a serious condition called hyponatremia (insufficient body salt).

Recommendation: Soldiers should maintain a balance of eating and drinking to sustain their electrolyte level. The standard MRE contains many items that will sustain the balance of electrolytes. If necessary, consider supplementing with an electrolyte replacing solution, such as beverage mix, Gatorade, or PowerAde.

(**Note:** Do not use eat salt alone as a treatment for hyponatremia. The food in the MRE or from the dining facility contains enough salt to balance the additional water in your system. The proper preventive measure is to eat well-balanced meals regularly.)

Issue: Flavored drink mix contaminating canteens and Camelbaks

Discussion: Soldiers are using sugar-based drink mixes to either increase the palatability of reverse osmosis water purification units (ROUPU) water or to replace electrolytes. If you use these solutions, it may increase the chances that the canteen or Camelbak container may become contaminated from the increased sugar in the mixes.

Recommendation: Do not use canteens and/or Camelbaks to mix drinks. Use your canteen cup and clean it thoroughly between uses. If you have to use a canteen or Camelbak, the container should be thoroughly rinsed at least everyday from an approved water source. Using these containers for drink mix should only be done if it does not tax the valuable potable water resources.

Issue: Dehydration from traveling

Discussion: Soldiers can easily become dehydrated and fatigued from travel, especially air travel.

Recommendation: Leaders must enforce adequate hydration, nutrition, and rest during travel. Prior to initiating travel, during travel, and upon arrival in theater, leaders must enforce good nutrition, hydration, and rest habits. This also means leaders must ensure that water and food are available to each and every Soldier throughout the trip. This means everyone arrives at the aerial port of embarkation (APOE) with full canteens and MREs available and replacements are arranged for or available en route.

Issue: Female Soldiers develop urinary tract infections because they find it difficult to urinate while traveling in a convoy

Discussion: Many females hold their urine awaiting a more convenient place to urinate and, as a result, increase their chances of developing a urinary tract infection.

Recommendation: Female Soldiers need to relieve themselves regularly despite the inconvenience. Developing a preventable infection could compromise the mission. There are several products available that can help while traveling, such as the TravelMate (<http://www.devicelink.com/expo/awards02/caringhands.html>) or Lady J device (<http://www.campmor.com/webapp/wcs/stores/servlet/ProductDisplay?productId=13827&memberId=12500226>).



Figure 39: TravelMate



Figure 40: Lady J device

Issue: Female Soldiers maintaining hygienic standards during their menstrual cycle

Discussion: It is extremely difficult to maintain the same hygienic standards while deployed as compared to garrison.

Recommendations: Female Soldiers should discuss this issue with their medical provider prior to deploying. If appropriate, there are many medications that temporarily stop menstrual cycles or prolong the interval between cycles.

Issue: Lack of hand washing stations

Discussion: If there is no hand washing facility, Soldiers neglect washing their hands prior to eating or after relieving themselves.

Recommendation: All Soldiers carry hand sanitizers (such as Purell) or antibacterial moist wipes



Figure 41: Purell



Figure 42: Hand wipes

Chapter 2: Collective Prevention (Platoon/Company Level)

This chapter covers in detail the requirements, equipment, and procedures that unit field sanitation teams need to follow to implement collective preventive medicine measures (PMM). Unit field sanitation is mandated by regulation. Units should not assume that they will receive field sanitation support from their higher headquarters. Unit field sanitation is a unit commander's responsibility. As outlined in **DA PAM 40-19 Commander's Guide to Combat Health Support**, the field sanitation is responsible for basic sanitation and insect and rodent control.

- **Basic sanitation:**

- Supervises the disinfection of unit water supplies and inspects/maintains unit water containers and the unit water trailer.
- Advises the unit food service personnel in the prevention and elimination of deficiencies in food service sanitation. The team instructs unit personnel, as necessary, in methods of washing individual eating utensils.
- Supervises the construction of garbage and soakage pits and assists in inspections for proper garbage disposal.
- Supervises the construction of field latrines and urinals and assists in the inspection for proper sanitation. (**Note:** A unit detail is responsible for the actual construction of field waste disposal facilities.)
- Assists in the guidance and inspection of personnel and facilities to ensure a high level of personal hygiene.
- Provides guidance as needed in the use of protective measures to prevent heat and cold injuries.
- Reports any sanitation inadequacies to the commander.

- **Insect and rodent control:**

- Ensures the practice of proper waste disposal essential for insect and rodent control.
- Explains to unit personnel how insects and rodents may affect their health and instructs them in the use of individual protective measures.
- Instructs how to properly wear the uniform to avoid insect-borne diseases.
- Procures and distributes components of the DOD Insect Repellent System (specifically, topical diethyltoluamide [DEET] formulations and permethrin formulations for impregnating clothing and tentage).
- Supervises the proper use of the DOD Insect Repellent System and bed nets and the proper wear of battle dress uniform to prevent bites by disease vectors.
- Supervises the application of authorized "general use" pesticides for insect pests and disease vectors.

- ° Inspects to ensure the elimination of food and shelter for insects and rodents.
- ° Performs limited insect and rodent management.
- ° Supervises the use of traps and authorized rodenticides as required in the control of rodents.
- ° Reports any other inadequacies.

SECTION A: FOOD AND WATER SUPPLIES

FOOD SUPPLIES

Bacteria that cause disease are called pathogens. When certain pathogens enter the food supply, they can cause food-borne illness. Millions of cases of food-borne illness occur each year. Most cases of food-borne illness can be prevented. Proper cooking or processing of food destroys bacteria. Food-borne illness often presents with flu-like symptoms such as nausea, vomiting, diarrhea, or fever that many people may not recognize as being caused by bacteria or other pathogens in food.

Age and physical condition place some persons at higher risk than others. Very young children, pregnant women, the elderly, and people with compromised immune systems are at greatest risk from any pathogen. Some persons may become ill after ingesting only a few harmful bacteria; others may remain symptom free after ingesting thousands.

How bacteria gets in food

Bacteria may be present on products when you purchase them. Raw meat, poultry, seafood, and eggs are not sterile. Neither is fresh produce such as lettuce, tomatoes, sprouts, and melons. Foods, including safely cooked, ready-to-eat foods can become cross-contaminated with bacteria transferred from raw products, meat juices, or other contaminated products or from food handlers with poor personal hygiene.

Danger zone

Bacteria multiply rapidly between 40°F and 140°F. To keep food out of this “danger zone,” keep cold food cold and hot food hot. Keep food cold in the refrigerator, in coolers, or on the service line on ice. Keep hot food in the oven, in heated chafing dishes, or in preheated steam tables, warming trays, and/or slow cookers.

Inspecting food sources and food service facilities

Preventive medicine has the primary responsibility for field food service sanitation inspections. Veterinary (VET) personnel may assist in these functions in the absence of preventive medicine personnel or through local coordination between the preventive medicine and VET units. Field sanitation can provide day to day supervision and spot checks that will greatly enhance the quality and cleanliness of the facilities providing food to Soldiers in Iraq. The field sanitation can be of great assistance to unit food service personnel in the prevention of such deficiencies; however, field sanitation members are not a replacement for inspections by trained preventive medicine and VET personnel.

The conditions under which food is transported, stored, prepared, and served can have a direct bearing on the success or failure of a military mission. Food contaminated with disease-causing

microorganisms through improper temperature control or unsanitary practices can result in outbreaks of food-borne disease. All persons who handle food must maintain the highest sanitation standards.

Although the field sanitation does not have to memorize every sanitary standard and regulation, they must use common sense and must be aware of the factors that contribute to food-borne disease outbreaks. The only way to control these factors is through proper supervisory actions.

The six factors that most often cause food-borne disease outbreaks are failure to:

- Refrigerate potentially hazardous cold foods and maintain a product temperature of 40°F or below.
- Cook food to proper temperature.
- Maintain potentially hazardous hot foods at a product temperature of 140°F or above.
- Protect foods from cross-contamination.
- Use proper transportation and storage practices.
- Protect food contact surfaces, pots and pans, eating utensils, and cutting boards from contamination.

Transporting food

Vehicles used for transporting food must be clean and completely enclosed, if possible. Vehicles used for transporting garbage, trash, petroleum products, or similar materials must not be used for transporting food unless the vehicles have been properly cleaned and sanitized. If bulk quantities of meat and dairy products are to be transported over a considerable distance, refrigerated containers should be used. Every unit should have clean tarpaulins, boxes, or bags to protect food from contamination. Perishable foods are stocked only at a level commensurate with the capacity of the food storage facilities of the unit.

Food storage

Immediately upon receipt, unit food service personnel must inspect the food. Any food suspected of being unfit for human consumption is referred to the supporting veterinary unit or to the medical authority for disposition instructions.



Figure 43

Food products requiring refrigeration should be stored at a temperature of 40°F (4.4°C) or below. Some units have a refrigerator and a generator as part of their equipment. Each unit with food preparation capabilities, however, is issued an ice chest with a 200-pound (90-kilogram) capacity. Every effort must be made to keep the temperature of food in the ice chest below 45°F (7°C).

- Food items that can support the rapid growth of food-borne disease microorganisms are called potentially hazardous foods (PHF). PHF are high in protein, high in moisture, and have a pH of 4.5 or higher. Given the right temperature for a long enough period of time, disease-causing microorganisms can grow rapidly in foods such as:
 - Chopped ham
 - Ground meat
 - Potato salad
 - Egg salad
 - Fish
 - Poultry
 - Cut melons
 - Cooked vegetables
 - Raw sprouts
 - Eggs

- All product temperatures must be monitored and PHF must be stored immediately in the best refrigeration available to maintain a safe product temperature.
 - Failure to maintain a safe product temperature of 40°F (5°C) and below or 140°F (60°C) and above is the leading cause of food-borne disease outbreaks. In addition to disease prevention, temperature control retards food spoilage and loss of culinary quality. (**Note:** Foods containing enough microorganisms or toxins to cause food-borne diseases may not have any changes in odor, taste, or appearance.)
 - Any temperature between 41°F (5°C) and 139°F (59°C) is in the "danger zone." Food products may have to be in the danger zone during some periods of preparation. The goal in temperature control is to minimize the time PHF are in the danger zone. Three hours of cumulative time is the maximum time PHF can be in the danger zone and not be a health hazard. After 4 hours in the danger zone, enough bacteria may have grown in the food to cause food-borne disease outbreaks.
- Transporting PHF from a base camp to troops at other locations requires the use of insulated food containers. Correct use of the insulated food container will help maintain safe product temperatures.
 - For hot foods, preheat the insulated container by using boiling water. Preheating the container helps maintain safe hot food temperatures. When preheated correctly, foods should remain at safe temperatures for 3 to 4 hours. Take the following steps for preheating:
 - Remove the inserts.
 - Pour 2 quarts/liters of boiling water into the container.
 - Close and let the container stand for at least 30 minutes.
 - Pour out enough water to provide room for the inserts.
 - Place the hot food (at least 140°F [60°C]) into the inserts and then place the inserts in the container.
 - Close and fasten the container lid. Label containers with common name of food, date/time filled, and the statement: "Food must be consumed by _____ hours" (a time no greater than 4-hours after filling [for insulated container]).
 - For foods that must remain cold, put crushed ice into the container to pre-chill it. When correctly pre-chilled, cold foods should remain at safe temperatures for 3 to 4 hours. Take the following steps for pre-chilling:
 - Remove the inserts.
 - Put crushed ice or 2 quarts (1.892 liters) of iced water into the container.
 - Close and let the container stand for 30 minutes.

Dump out enough ice to provide room for the inserts

Place the cold food (below 45°F [7.5°C]) into the inserts and then place the inserts in the container.

Close and fasten the container lid. Label containers with common name of food, date/time filled, and the statement: "Food must be consumed by _____ hours" (a time no greater than 4 hours after filling [for insulated containers]).

- Semi-perishable food also requires proper storage and handling.
 - Vegetables, such as potatoes and onions, should be stored in a dry place and arranged so air can circulate around them, thus retarding decay and spoilage.
 - Screened food boxes may be used to keep such items as bread for a short period. These screened boxes are suspended to permit free circulation of air and to protect the food from insects and rodents. The food is covered before it is placed in the boxes to protect it from dust.
 - Items such as flour, sugar, and rice should be stored in their original containers. They should be placed in metal containers with tightly fitting lids and protected from excessive heat and moisture. Improper storage can result in loss from rodent or insect infestation or from deterioration because of excessive heat or moisture.
 - Acid food or beverages, such as potato salad, tomato juice, lemonade, citrus fruit drink, or other acidified drinks must never be stored or served in galvanized containers because they are capable of dissolving the zinc which can cause heavy metal poisoning.

Personal hygiene of food handlers

Food handlers can be a primary source of disease and food contamination. The following measures should be taken to minimize this hazard:

- Daily inspection of personnel by supervisors
- Instructions to food handlers on maintenance of personal hygiene, especially proper hand washing
- Provisions for clean uniforms
- Provisions for adequate toilet and hand washing facilities
- Referral of ill food handlers to the medical facility
- Ensure previously ill food handlers are cleared by the medical facility before returning to duty
- Consideration of diseases prevalent in local area before deciding to use indigenous personnel in food service facilities

- All cuts on hands, regardless of whether they are obviously infected or not, must be bandaged and then a glove must be worn
- All food service personnel, to include kitchen police, will not use any tobacco products (including smokeless tobacco) in the food service area

(**Note:** Persons who appear ill or have been absent from work because of a communicable disease, including diarrhea, must be referred to the medical treatment facility for determination of fitness for duty before resuming work. Changes to this policy may be directed by the command surgeon based on local conditions.)

The food service supervisor or other supervisory personnel of the food-handling activity inspects all food service personnel daily at the beginning of their duty shift and observes them throughout the work period for signs of illness. Anyone showing evidence of illness, skin disease, and infected cuts or boils is not permitted to handle food unless cleared by a medical officer. Food workers must thoroughly wash their hands before working with food preparation. Hand washing after visiting the latrine must become an unailing habit.

Cleaning and sanitizing utensils

Cooking utensils are washed, rinsed, sanitized, and properly stored after each use.

- In the field, scrape free of food particles
- Wash in hot (120° to 150°F/48.88° to 62°C), soapy water
- Rinse in one container of boiling water
- Sanitize in another container of boiling water or an approved chemical sanitizer
- Allow to air dry
- Store in a clean covered place that is protected from dust and vermin

Physical facilities

The physical facilities where food is stored, prepared, and served must be free of rats, mice, flies, roaches, ants, and other vermin. Screening and rat proofing methods are used to the greatest extent possible. Repairs are made as soon as the need is indicated.

- Food and utensils are stored in protected places.
- Repairs to facilities should be made as soon as the need arises.
- Proper waste disposal and control methods are used to eliminate arthropod and rodent feeding and breeding places. When pesticides are used, the directions on the container must be followed exactly! (**Note:** Extreme care is taken when using pesticides in the presence of food. All food and food contact surfaces must be protected during the application of pesticides. Pesticides must never be stored in any food storage area. Wash, rinse, and sanitize food preparation utensils and surfaces prior to use after pesticide application inside field kitchens. If preventive medicine Soldiers or contractors conduct area pesticide applications [fogging or aerial spraying, for example], food preparation areas must be washed, rinsed, and sanitized prior to use.)

Preparing and serving food

The food service functions should be coordinated to eliminate any unnecessary lapses of time between preparing and serving food. Every effort must be made in handling food items to keep them from becoming contaminated.

Potentially hazardous foods furnish a very good media for the growth of microorganisms. To keep leftover PHF in the field is setting a unit up for disaster. Meats, milk, and eggs are especially hazardous. Salads, chopped meats, and sandwich fillings require considerable handling during preparation, thus increasing the possibility for contamination.

- Avoid serving PHF if they cannot be served immediately or promptly refrigerated.
- Meals must be planned to reduce the amount of leftovers. No food items will be retained as leftovers for reuse. Prepared refrigerated items that have not been placed on the serving line may be retained at the correct stated temperatures for no more than 24 hours.
- Never save foods such as opened T-rations, creamed beef, casseroles, gravies, or creamed sauces.

Fresh fruits and vegetables grown in areas where human excreta is used as fertilizer or where gastrointestinal or parasitic diseases are prevalent must not be consumed raw except with the approval of the medical authority. All foods must be obtained from approved sources. Local purchase of fruits, vegetables, or other products is prohibited without written approval from U.S. Army veterinary personnel.

Fruits and vegetables authorized for consumption, including leafy vegetables, may be served raw if they are taken or broken apart to expose all leaf surfaces. They must be washed with approved disinfectant according to the packet label instructions and then rinsed with potable water to remove any visible dirt.

- If approved disinfectant is not available, emergency disinfection of fruits and vegetables may be accomplished by thoroughly washing them, then soaking them for 30 seconds in a 200-ppm/mg/l chlorine solution or by immersing them in potable water at 160°F (71.1°C) for 1 minute. (Prepare the chlorine solution by mixing 1 tablespoon of household liquid bleach [sodium hypochlorite 5-percent] with 1 gallon of potable water.)
- Certain fruits and berries, such as strawberries, cannot be properly washed or readily disinfected; therefore, they should not be served or eaten raw outside the U.S.

Suspected food-borne illness guidelines

- Preserve the evidence. If a portion of the suspect food is available, wrap it securely, mark "DANGER," and freeze it.
- Save all the packaging materials, such as cans or cartons. Write down the food type, the date, other identifying marks on the package, the time consumed, and when the onset of symptoms occurred. Save any identical unopened products.
- Seek treatment as necessary. If the victim is in an "at risk" group, seek medical care immediately. Likewise, if symptoms persist or are severe (such as bloody diarrhea,

excessive nausea and vomiting, or high temperature), seek medical care at nearest medical treatment facility (MTF).

- Report incident up through chain of command as well as medical channels to prevent further outbreaks from the same source.

WATER SUPPLIES

Importance of water in the practice of sanitation

Water is essential to the army in the field. Safe water ranks in importance with ammunition and food as a unit of supply in combat and often has an important bearing on the success or failure of a mission. When in the field, Soldiers must be supplied with sufficient potable water to drink and for personal hygiene (such as shaving, brushing teeth, helmet baths, and comfort cleaning). The water for these purposes must be safe for human consumption and should be reasonably free of objectionable tastes, odors, turbidity, and color. For showering, disinfected nonpotable fresh water is to be used. However, only potable water will be used for showering, bathing, or bodily contact in locations:

- Where diseases such as schistosomiasis and leptospirosis are endemic and prevalent
- Where chemical agents may be present

Water as a vehicle in disease transmission.

A primary source of illness to the Soldier is water-borne disease organisms. Common water-borne diseases of man are hepatitis, typhoid and paratyphoid fever, bacillary and amoebic dysentery, cholera, common diarrhea, leptospirosis, and schistosomiasis.

No direct method has been developed for detecting the minimum infectious quantities of these organisms in water; therefore, it is necessary to resort to an indicator test to determine the bacteriological acceptability of water. The water is tested for the presence of coliform bacteria.

- Coliform bacteria are found in great numbers in the excreta (feces) of humans, warm-blooded animals, and in soil. Many of the diseases mentioned above are spread through feces.
- Although the presence of coliform bacteria in water may not prove fecal contamination, it is an indication that pathogenic (disease-carrying) organisms may be present. If the indicator test confirms that contamination exists, assume that pathogens are present.
- Many military units in the field do not have the capability for determining the presence of coliform bacteria in water; hence all water must be thoroughly treated and disinfected before use.

Quantity of water required for Soldiers

The quantity of water required for Soldiers varies with the season of the year, the geographical area, and the tactical situation.

- In a cold climate, only 2 gallons (7.57 liters) of water per Soldier per day may be required for drinking purposes even though they are engaged in physical activity.

- In a hot climate, 3 or 4 gallons (11.355 to 15.14 liters) per man per day may be required when they are engaged in only sedentary duty.
- Additional amounts of water are required for personal hygiene and cooking. A guide for planning to meet the water requirements in an arid zone is 3 to 6 gallons (11.355 to 22.71 liters) per individual per day unless improvised showering facilities are made available. In this case, the requirement should be increased to 15 gallons (56.775 liters) or more.

(**Note:** For additional information on water requirements, see **FM 10-52, *Water Supplies in Theaters of Operations***.)

Responsibilities for the production of potable water in the field

- The Army Medical Department (AMEDD) establishes standards for water quality; inspects water points or sources; provides advice on potable treatment methods for purification; and after appropriate laboratory or field examination, approves water for consumption.
- The Corps of Engineers identify potential sources of water and water point development. The selection of water points may be based on examination of data provided by the AMEDD, as well as the reconnaissance performed by the engineers.
- The Quartermaster (QM) Corps sets up and operates bulk water treatment equipment. They obtain, treat, and then distribute the treated water. Sometimes, the QM units transport water to centralized distribution points (dry points) for convenient pick up by military units. However, the usual practice is to provide standpipes adjacent to the water point for filling unit water trailers or containers.
- The unit commander makes certain that the unit has an adequate supply of safe drinking water, enforces the rules of water discipline, and ensures that each individual thoroughly understands the danger of drinking unsafe water. The rules of water discipline include the following:
 - Drink approved water only.
 - Conserve water.
 - Protect water sources by good sanitary practices.

(**Note:** It should be emphasized that water discipline does not imply teaching Soldiers to do without water. It means using water intelligently and not wasting it.)

Terms and definitions

- Palatable water: Water that has an agreeable taste and odor.
- Potable water: Water that is fit for humans to drink.
- Water treatment: Procedures that are used to change the chemical, physical, or microbiological quality of water.

- Disinfection: A process of killing infectious agents outside the body by direct exposure to chemical or physical agents.
- Chlorination: A water treatment process that uses chlorine or a chlorine compound.
- Chlorine dosage: The total amount of free available chlorine (FAC) or chlorine compound added to a given amount of water.
- Chlorine demand: The amount of FAC that is used or consumed by substances in the water before a chlorine residual develops.
- Chlorine residual: The amount of FAC left after chlorination has taken place.
- Parts per million (ppm). A measure of concentration. One part per million (ppm) of chlorine means one part chlorine to 1,000,000 parts water.

Sources of usable water

- Surface water including streams, ponds, rivers, and lakes
- Ground water including wells and springs
- Rainwater collected from the roofs of buildings or other surfaces
- Water from melting ice
- Water from melting snow
- Water obtained from oceans or salty seas cannot be used for human consumption until it has been distilled or demineralized to remove the salt

(**Note:** Water taken from any of these sources must be treated before use, as all sources of water in the field are considered contaminated.)

Factors considered in selecting a water source

- Military situation
- Quantity of water needed
- Accessibility of the source
- General quality of the source
- Type of purification equipment available for use

Water treatment

The objective of water treatment is to produce safe drinking water. Water treatment in the field environment is accomplished through a process called reverse osmosis (RO). The QM Corps employs specialized reverse osmosis water purification units (ROWPU) to produce water. The ROWPU uses the three levels of filtration described below:

- The multimedia filter is the first stage of removing matter from raw water. This filter contains activated carbon and sand of varying grain size. The objective is to remove gross particulate matter with the sand, chemicals, and activated carbon.
- Cartridge filtration is the second stage for water treatment. The cartridge filter consists of woven fabric tubes that are inserted in a cartridge. The filter tubes act as micron filters, removing fine particulate matter carried over from the multimedia filter.
- Reverse osmosis is the final stage of filtration. The RO filter consists of a semipermeable membrane. Under hydrostatic conditions, water will migrate from the side of the semipermeable membrane that has the lower concentration of dissolved or suspended matter to the side with greater concentration. This movement of water through the semipermeable membrane is referred to as osmosis. In RO, substantial pressure on the side of the higher concentration of matter is increased in order to counter the osmotic pressure and force the water through the semipermeable membrane in the direction opposite to the osmotic flow.

Water disinfection

Disinfection is a physical or chemical process of destroying potentially pathogenic organisms in the water. This is accomplished by boiling the water, micro filtration, ultraviolet radiation, or using iodine tablets or calcium hypochlorite.

Field units employ calcium hypochlorite for disinfecting water. Calcium hypochlorite comes in a white powder making it much easier to use than liquid or gaseous chlorine products. It is the hypochlorite that oxidizes and destroys the pathogen. Since calcium hypochlorite is nearly 72 percent hypochlorite by weight, it is approximately 70 percent effective.

(**Note:** Experience has proven that in most cases the major portion of the chlorine demand is satisfied within 10 minutes after chlorine dosage is added. Even if the required chlorine residual is present after this period, an additional contact period of 20 minutes is mandatory before the water can be consumed.)

- Water treated by a ROWPU requires a chlorine residual of 2 ppm/milligrams per liter (mg/l) after a 30-minute total contact period.
- Emergency field water not treated by a ROWPU requires a chlorine residual of 5 ppm/mg/l after a 30-minute total contact period.

Methods of disinfecting water

- Water purification (Lyster) bag and calcium hypochlorite is the most satisfactory and convenient method for disinfecting water for a small unit in the field.
 - The 36-gallon Lyster bag is issued to units on the basis of one per 100 persons.
 - The calcium hypochlorite is issued in ampules for handling convenience. Each ampule contains 0.5 gram of calcium hypochlorite and gives a dosage of approximately 2 ppm/mg/l after initial chlorine demand is met. Several ampules may be added to the water in the Lyster bag. As many ampules as necessary are used to provide the required 5 ppm/mg/l chlorine residual after a 10-minute contact period.

- ° After the desired chlorine residual is obtained, the water is allowed to stand for an additional 20 minutes before use.
- ° When a residual above 5 ppm/mg/l is desired, the 5 ppm/mg/l chlorine residual after a 10-minute contact is first obtained, then the number of ampules of calcium hypochlorite required to create the desired residual are added. The number required is based on the fact that after the initial chlorine demand is satisfied, one additional ampule will raise the residual approximately 2 ppm/mg/l in 36 gallons of water. After additional chlorine has been added, a 30-minute contact period must be allowed before the water is consumed.
- ° The Lyster bag must be cleaned of dirt and debris before it is used and hung by supporting ropes before it is filled with water. The bag is scrubbed and cleaned inside with a solution made with two ampules of calcium hypochlorite dissolved in 1 gallon (3.8 liters) of water.



Figure 44: Lyster bag

(**Note:** The concentration of chlorine in a solution (one ampule of calcium hypochlorite in 1 gallon of water) is approximately 100 ppm. This may be too low to effectively sanitize the canvas Lyster bag. Thus the recommended concentration is two ampules per gallon for sanitizing the Lyster bag prior to initial use.)

The cleaned bag is filled only to within 4 inches (10 centimeters) from the top.

If possible, the water is settled and cleared (perhaps even strained through a cloth) before it is poured into the Lyster bag. Do not pour in the settlings.

Before adding the calcium hypochlorite, first dissolve it in a canteen cup with a small amount of water taken from the Lyster bag. As this mixture is poured into the Lyster bag, the water is stirred with a clean stick.

Flush the faucets with a small quantity of water. After 10 minutes, flush the faucets again and determine the chlorine residual (see below). (**Note:** The sample must not be collected in the same cup or container used to dissolve the calcium hypochlorite.)

- The 400-gallon (1,514-liter) water trailer and calcium hypochlorite method.
 - When the water trailer arrives in the unit area from the refill point, verify that the water contains the correct chlorine residual. The chlorine residual should be at the level established for the area of operations (AO).
 - If the residual meets the required standard, the water is safe to drink; if not, the water must be re-chlorinated to the required level. (**Note:** After re-chlorination, the water must be checked periodically to maintain the minimum required level. Heat and sunlight will cause chlorine to evaporate/dissipate more rapidly; therefore, periodic re-chlorination may be required.)
 - To re-chlorinate a full water trailer:

Mix one meal, ready-to-eat (MRE) spoonful of calcium hypochlorite from the 6-ounce bottle (or 22 ampules) with $\frac{1}{2}$ canteen cup of water.

Thoroughly mix the slurry and then add it to the water in the trailer. Use a clean stick or other clean device to mix the chlorine slurry in the water.

Flush the four water taps for several seconds. Wait 10 minutes, then flush the taps again and check the chlorine residual. If the residual is at least 1 ppm/mg/l or greater, wait an additional 20 minutes before releasing the water for consumption.

- If the residual is below that required for the AO, additional chlorine must be added to the water as follows:

Mix a slurry as before; however, the amount of chlorine required may be less than one MRE spoonful.

Wait 10 minutes and check the chlorine residual. Flush the taps again and check the chlorine residual. If the chlorine residual is not adequate, the flushing and testing procedures described above must be repeated.

If the residual is 1 ppm/mg/l or greater, wait an additional 20 minutes before releasing the water for consumption.

- The 5-gallon can and calcium hypochlorite method.
 - Water disinfection using a 5-gallon can is accomplished by using one ampule of calcium hypochlorite to ½ canteen cup of water to disinfect fifteen 5-gallon cans.
 - The desired chlorine residual should be 1 ppm of water.
- Disinfect individual canteens using iodine tablets or ampules of calcium hypochlorite. The following method is used when Soldiers are on the march or on patrol and the only source is raw/unapproved water.
 - One iodine tablet releases 8 ppm/mg/l of iodine as a disinfecting agent; two tablets ensure adequate disinfection of a 1-quart canteen of water (current guidance is two tablets to prevent giardiasis). This amount is normally more than adequate for clear water. However, two tablets are recommended for both clear and cloudy water to ensure adequate disinfection.

Place the tablet(s) into the canteen.

After 5 minutes, shake the canteen.

Loosen the canteen cap and allow the iodine-treated water to seep around the neck of the canteen to kill any organisms harbored there.

A minimum contact time of 30 minutes is required for water disinfection using the iodine purification tablets.

(Note: At the present time, there is no method that may be used in the field to determine the iodine residual.)

- When calcium hypochlorite is used instead of the iodine tablet:

Prepare a solution by dissolving the contents of one calcium hypochlorite ampule in ½ canteen cup of water.

Use the standard ½ plastic canteen capful or 1 nuclear, biological, chemical (NBC) canteen capful of this concentrate in each canteen of water.

After 5 minutes, allow the chlorine-treated water to seep around the neck of the canteen to kill any organisms harbored there.

(Note: A total of 30-minutes contact time is required before drinking the water. Sometimes the addition of small amounts of chlorine to water causes disagreeable odors or taste to develop. If this occurs, one or more additional canteen caps of the prepared solution will usually correct the condition.)

- Household bleach may be used to disinfect plastic containers and canteens. Ensure the bleach is unscented.

- Fill your canteen with the cleanest water possible.
- Read the label on the bleach bottle to determine amount of available chlorine. Liquid chlorine laundry bleach usually has about 5 to 6 percent available chlorine. Based upon the strength of the household bleach, add the chlorine to the canteen as directed in the table below.

Drops of Household Bleach to be Added to a One-Quart Canteen		
AVAILABLE CHLORINE	CLEAR WATER	COLD or CLOUDY WATER
1 %	10 Drops	20 Drops
4 to 6 %	2 Drops	4 Drops
7 to 10 %	1 Drop	2 Drops

- Place the cap on your canteen and shake. Slightly loosen the cap and tip the canteen over to allow leakage around threads. Tighten the cap and wait 30 minutes before drinking the water.
- 1-quart canteens and chlorine ampules:
 - Fill your canteen with the cleanest water available.
 - Mix one ampule of chlorine with one-half canteen cup of water; stir the mixture with a clean device until contents are fully dissolved.
 - Pour one canteen capful of the above solution into your canteen of water.
 - Place the cap on your canteen and shake. Slightly loosen the cap and tip the canteen over to allow leakage around threads. Tighten cap and wait 30 minutes before drinking.
 - If the nuclear, biological, and chemical (NBC) canteen cap is used, then use two caps of the solution.

(**Note:** By wearing gloves or wrapping the ampule in paper or cloth, you can avoid cutting your hands when breaking open the glass ampule.)
- If you have other containers (Camelbaks, 2-quart canteen, etc.) use your 1 quart canteen and any of the above methods then pour the water into your disinfected container.
- Emergency water treatment kit (Chlor-Floc tablets):
 - Tear off the top of the plastic water treatment bag at the perforation (first time use).
 - Fill the treatment bag one-half full with the cleanest water available; add 1 tablet.
 - Fold bag tightly three times and fold tabs in.

- Hold bag firmly and shake until tablet dissolves. Swirl 10 seconds. Let the bag sit for 4 minutes. Swirl again for 10 seconds.
- Let bag sit for an additional 15 minutes.
- Insert filter pouch in neck of canteen. Pour water from bag through the filter into the canteen. Avoid pouring sediment into the filter.
- Rinse the filter with treated water after use. Always filter through the same side of the filter.
- Rinse sediment from treatment bag. Save bag for water treatment only.

CAUTION: Do not drink from the treatment bag! The water is still contaminated and must be filtered before drinking. Not filtering may cause stomach and intestinal disorders.

- Boiling water is used when disinfecting compounds are not available.
 - Boiling water for disinfection is not the best method, since there is no residual protection against re-contamination.
 - Boiling water at a rolling boil for 5 to 10 minutes kills most organisms that are known to cause intestinal diseases.
 - In an emergency, even boiling water for 15 seconds will help. Care must be taken to use clean containers for boiling the water.
 - After boiling, the water must be stored in a clean, closed container to prevent re-contamination.
- Commercially available alternatives to water treatment are also available. An example is Chlor-Floc that combines chlorination for disinfection along with the process of flocculation to remove suspended solids.

Determination of chlorine residual.

The N, N-diethyl-p-phenylene-diamine (DPD) chlorine residual determination kit has been procured and placed in the updated field chlorination kits. The new kit consists of a color comparator with color comparisons for measuring 1, 1.5, 2, 3, 5, and 10 mg/l chlorine residual. The procedure for testing chlorinated water with this kit is as follows:

- Treat the water with desired amount of chlorine. Wait 10 minutes.
- Fill the comparator with treated water to a level above the uppermost black border.
- Open one DPD tablet package and drop the tablet into the comparator. Wait 2 minutes, place your thumb over the opening and invert the comparator 3 times (this is a must for correct reading).
- If the color of the water in the left window marked 1 is the same or darker than the right window marked 1, then the water is acceptable if a 1-mg/l residual is desired. If

the color of the water is lighter than the window marked 1, repeat chlorination, wait 10 minutes and retest the water.

- If higher residuals are required, compare the color of the water in the left window with the color of the right window of the required level.
- If the colors match or the left window is darker, then the required level has been met.
- Wait an additional 20 minutes before drinking the water.

CAUTION: When testing water with the DPD test kit, carefully observe the color changes of the water. When the chlorine residual is above 10 mg/l, the water color will change through the test kit levels, then turn clear. Failure to carefully observe color changes may lead to excessive chlorination of the water supply.

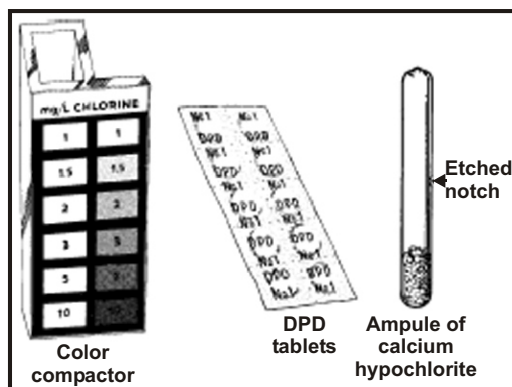


Figure 45: DPD tester kit

Point of consumption

Water at the point of consumption must show a trace residual. Recommend that water in a 400-gallon trailer have a FAC residual of approximately 1 ppm. Standard ROWPU-produced water is required to have a FAC residual of 2 ppm.

Water consumption under emergency conditions

Under emergency conditions in which water is obtained from a natural or unapproved source such as a lake, river, or host nation water distribution system and no treatment (for example, ROWPU) is available, residuals of 5 ppm should be used.

SECTION B: WASTE DISPOSAL

Human waste disposal becomes a problem for both the individual and the unit in the field. Local, state, federal, and host-nation regulations or laws may prohibit burning or burial of waste. The proper disposal of all wastes is essential in preventing the spread of diseases. Liquid and solid wastes produced under field conditions may amount to 100 pounds (45 kilograms) per person per day, especially when shower facilities are available. A camp or bivouac area without proper waste disposal methods soon becomes an ideal breeding area for flies, rats, and other vermin and may result in diseases such as dysentery (amoebic and bacillary), typhoid, paratyphoid, and cholera among Soldiers.

- The unit commander is responsible for proper waste disposal in his unit area. Commanders should check with the logistics officer (U.S. Army [S4]) or the supporting preventive medicine officer for assistance with the removal of hazardous waste.
- The preventive medicine personnel are responsible for inspecting waste facilities and methods of operation. They recommend changes which aid in protecting the health and welfare of Soldiers. Unit medical personnel can also assist in this.

TYPES/CONSTRUCTION OF LATRINES

Chemical latrines are the preferred human waste disposal devices for use during field exercises or missions.

When chemical latrines are not available, individuals and units must use improvised devices as discussed below. During short halts when troops are on a march, each Soldier uses a brief relief bag or a cat-hole latrine. The cat-hole latrine is dug approximately 1-ft (30-cm) deep and is completely covered and packed down after use. (**Note:** When utilizing a cat-hole latrine during the halt from a march, security is a significant issue. The buddy system is the best way to ensure your security while utilizing a cat-hole latrine.) In temporary bivouac areas (1 to 3 days), the straddle trench latrine is used unless more permanent facilities are provided for the unit.

When setting up a temporary camp, a deep pit latrine and urine soakage pits are usually constructed. Alternate devices, which may be used to dispose of human waste in the field, are the burn-out, mound, bored-hole, or pail latrines. The burn-out latrine is the preferred method for improvised devices. If possible, urinals should be provided in these facilities to prevent soiling the toilet seats. The numbers of latrines are based on one commode or urinal per 25 male Soldiers and one commode per 17 female Soldiers.

(**Note:** Decide where to locate the latrines, garbage pit, and/or burn area in relation to the food service facility as soon as the unit arrives at a site.)

Ensure the following field sanitation rules are followed:

- Latrines should be constructed to prevent the contamination of food and water.
 - Locate latrines at least 100 yd (90 m) downwind (prevailing wind) and down gradient from the unit food service facility and at least 100 ft (30) from any unit ground water source.
 - For further protection, do not dig latrines to the ground water level or in places where pit contents may drain into the water source.

- Latrines are usually built at least 30 yd (30 m) from the border of the unit area but within a reasonable distance for easy access.
- A drainage ditch is dug around the edges of the latrine enclosure to keep out rainwater and other surface water.
- A hand washing device is installed outside each latrine enclosure; these devices should be easy to operate and kept full of water. Each individual must wash his hands after he uses the latrine.
- The waste in latrines should be sprinkled with lime, ash, or soil daily to reduce the potential spread of disease. (**Note:** Plan to take lime with you on deployment to sanitize and properly close latrines. If lime is unavailable, ash from garbage burn pit, if necessary, can also be used for these purposes.)
- When a latrine is filled to within 1 ft (30 cm) of the ground surface or when it is to be abandoned, it is closed in the following manner:
 - The pit is filled to the ground surface in 3-in (8-cm) layers; each layer is compacted to prevent fly pupae from hatching and gaining access to the open air.
 - Dirt is then compacted over the pit to form a mound at least 1-ft (30-cm) high.
 - A sign is posted with the date and the words “closed latrine” if the tactical situation permits.
 - Use a layer of lime if available. Powdered, chlorinated lime is available at building supply stores. It can be used dry. Be sure to get chlorinated lime and not quick lime, which is highly alkaline and corrosive. In the absence of lime, ashes or soil can also be used.

(**Note:** Lime has an irritative effect that could lead to irreversible damage to the skin and blindness. In case of contact with lime, wash immediately and abundantly with water. Lime dust is dangerous to the eyes and respiratory tract. Spreading lime must be tasked to experienced and properly equipped [gloves, boots, goggles, etc.] Soldiers.)

CAUTION: Chlorinated products that are intended to be mixed with water for use can be dangerous if used dry.

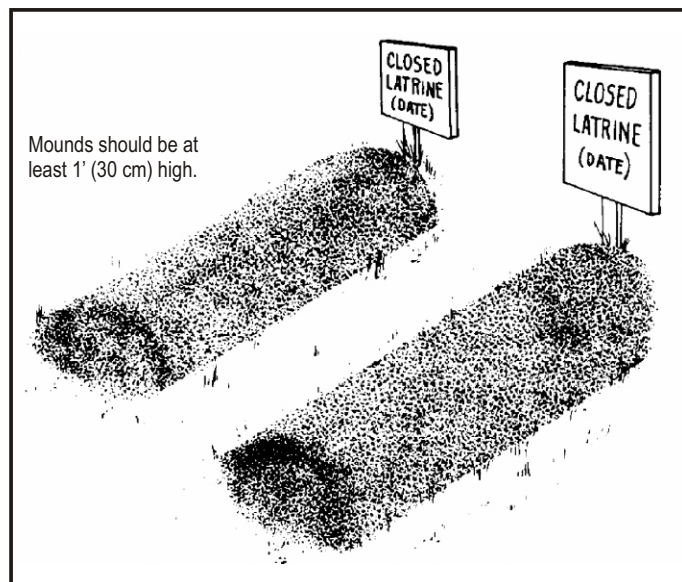


Figure 46

Chemical latrines

- Chemical latrines are used in the field when federal, state, or local laws prohibit the use of other field latrines.
- These toilets have a holding tank with chemical additives to aid in decomposition of the waste and for odor control. The number of such facilities required is established by the surgeon or other medical authority in the area of operations (AO).
- The facility must be cleaned daily and the contents pumped out for disposal in a conventional sanitary waste water system. How often the facility is emptied is determined by the demand for use of the device.

When chemical latrines are not available, the following improvised devices can be used. For company size elements or larger it is advisable to plan all these facilities out and then request engineer support to construct them.

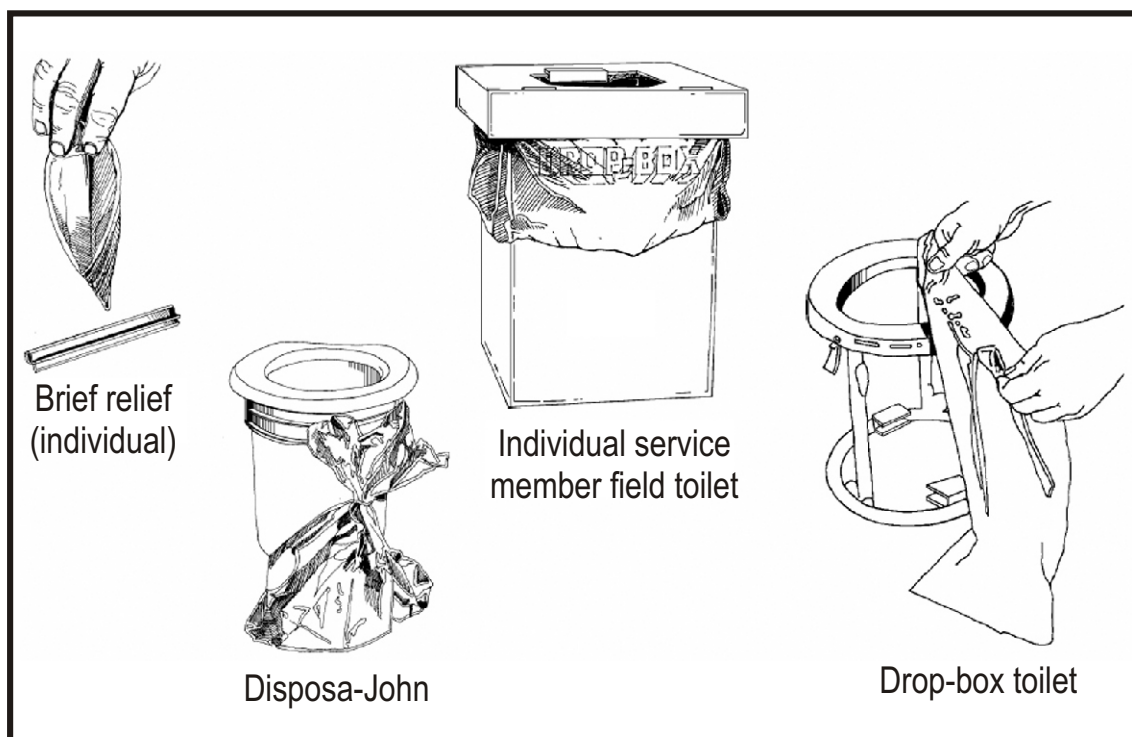


Figure 47

WARNING: Do not delay the construction of these facilities waiting for the engineer support, as this will most likely allow the sanitation in the camp to deteriorate significantly.

Burn-out latrine

The burn-out latrine may be provided when the soil is hard, rocky, or frozen, making it difficult to dig a deep pit latrine. It is particularly suitable in areas with high water tables because digging a deep pit is impossible. The burn-out latrine is not used when regulations prohibit open fires or air pollution. Personnel should urinate in a urine disposal facility rather than the burn-out latrine, as more fuel is required to burn out the liquid.

- To construct a burn-out latrine, an oil drum is cut in half and handles are welded to the sides of the half drum for easy carrying.
- A wooden seat with a fly proof, self-closing lid is placed on top of the drum.
- The latrine is burned out daily by adding sufficient fuel to incinerate the fecal matter. A mixture of 1 qt (1 l) of gasoline to 4 qt (4 l) of diesel oil is effective, but must be used with caution. If possible, have two sets of drums, one set for use while the other set is being burned clean. If the contents are not rendered dry and odorless by one burning, they should be burned again. Any remaining ash should be buried.

DANGER: Highly volatile fuel such as JP4 (jet propulsion fuel, grade 4) should not be used because of its explosive nature.

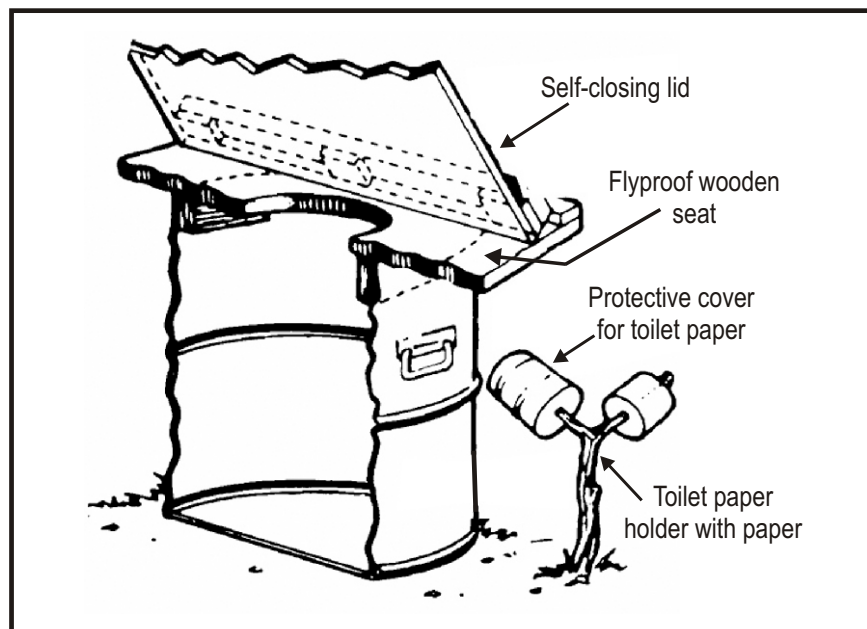


Figure 48: Example 1 of burn-out latrine

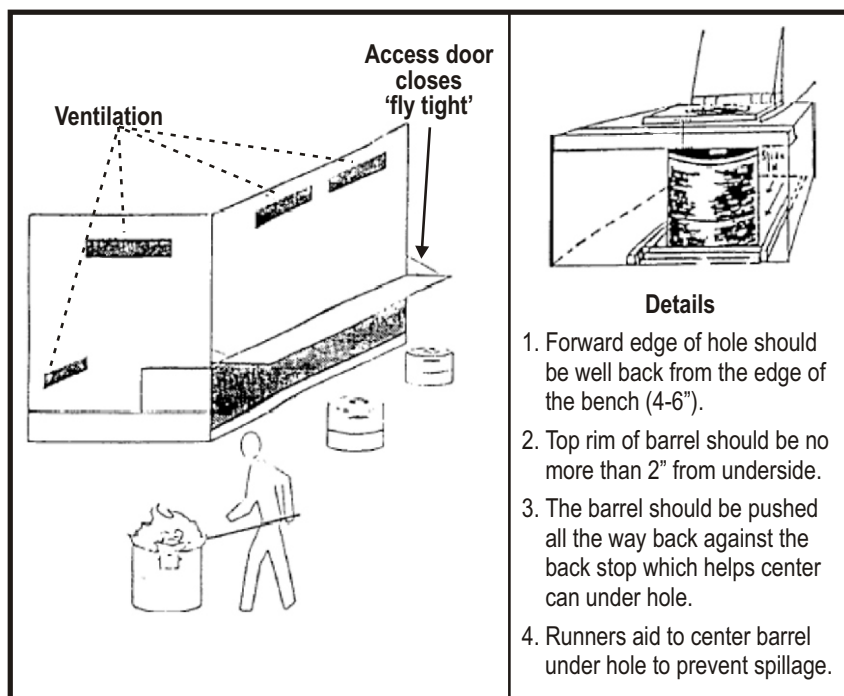


Figure 49: Example 2 of burn-out latrine

Straddle trench latrine

- The trench is dug 1-ft (30-cm) wide, 2 1/2-ft (75-cm) deep, and 4-ft (120-cm) long. Two ft (60 cm) of length are allowed per person. These trenches, which are constructed parallel to one another, are spaced at least 2 ft (60 cm) apart.
- Since there are no seats on this type of latrine, boards may be placed along both sides of the trench to provide sure footing.
- As the earth is removed, it is piled at one end of the trench, and a shovel or paddle is provided so that each Soldier can promptly cover his excreta.
- Toilet paper is placed on suitable holders and protected from bad weather by a tin can or other covering.
- The straddle trench latrine is closed using the same method described above.

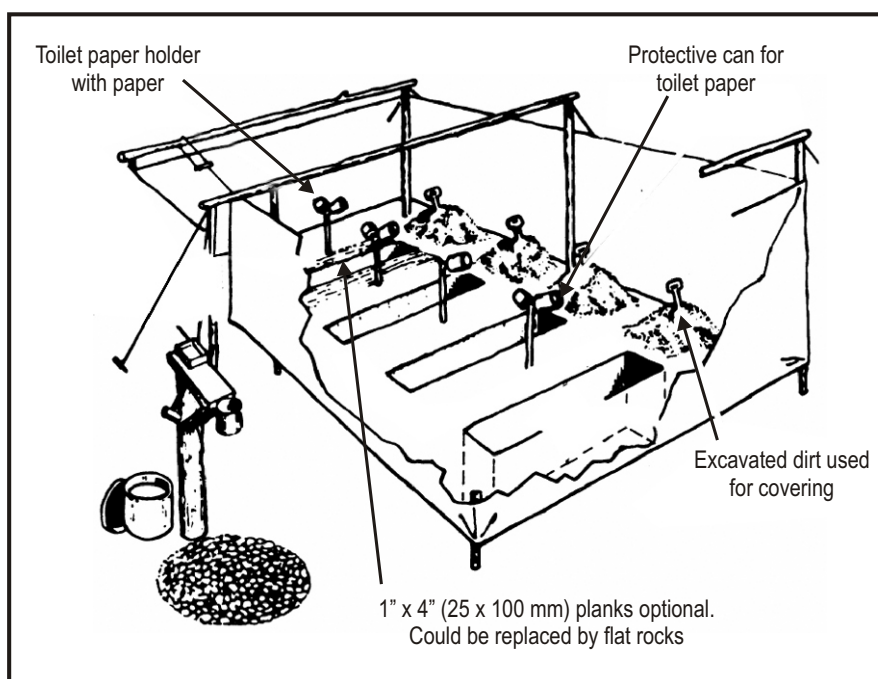


Figure 50: Example of straddle trench latrine

Deep pit latrine

- The deep pit is used with the standard latrine box which is issued to or built by the unit.
- The two-seat box is 4-ft (120-cm) long, 2 1/2-ft (75-cm) wide at the base, and 18-in (45-cm) high. A four-seat box 8-ft (240-cm) long, 2 1/2-ft (75-cm) wide at the base, and 18-in (45-cm) high may be built by the unit using scrap lumber or other material.

- The pit is dug 2-ft (60-cm) wide and either 3 ½- or 7 1/2-ft (105- or 225-cm) long, depending on the size of the latrine box. This allows 3 in (8 cm) of earth on each side of the pit to support the latrine box.
- The depth of the pit depends on the estimated length of time the latrine will be used. As a guide, a depth of 1 ft (30 cm) is allowed for each week of estimated use, plus 1 ft (30 cm) of depth for dirt cover.
- Generally, it is not desirable to dig the pit more than 6-ft (2-m) deep because of the danger of the walls caving in.
- Rocks or high ground water levels may also limit the depth of the pit. In some soils, supports of planking or other material may be necessary to prevent the walls from caving in.
- To prevent fly breeding and to reduce odors, the latrine box must be kept clean, the lids closed, and all cracks sealed.
- If a fly problem exists, they may be controlled by the application of a residual pesticide. Control effects should be based on fly surveys and pesticides applied in accordance with label directions.
- Pit contents should not be sprayed routinely since flies can develop resistance to pesticides if used over and over.
- The latrine boxes and seats should be scrubbed daily with soap and water.
- Using lime in the pit or burning out the pit contents is not effective for fly or odor control; therefore, these methods are not recommended. The deep pit latrine is closed as described above.

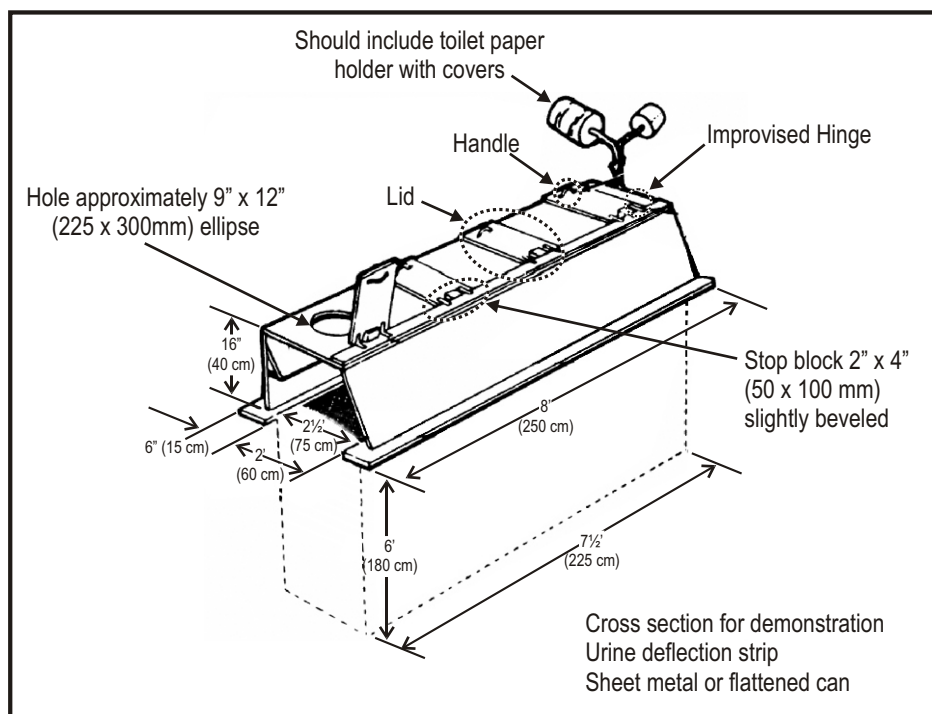


Figure 51: Example of deep pit latrine

Mound latrine

- This latrine may be used when a high ground water level or a rock formation near the ground surface prevents digging a deep pit. A dirt mound makes it possible to build a deep pit and still not extend it into the ground water or rock.
- A mound of earth with a top at least 6-ft (2-m) wide and 12-ft (4-m) long is formed so that a four-seat latrine box may be placed on top of it. It is made high enough to meet the pit's requirement for depth, allowing 1 ft (30 cm) from the base of the pit to the level of the ground water or rock level.
- The mound is formed in approximately 1-ft (30-cm) layers. The surface of each layer is compacted before adding the next layer.
- When the desired height is reached, the pit is then dug in the mound. Wood or other bracing may be needed to prevent the pit walls from caving in.
- An alternate method is to construct a latrine pit on top of the ground, using lumber, logs, corrugated sheet metal, or whatever other material is available. Pile dirt around it and up to the brim creating the mound around the latrine pit.
- The exact size of the mound base depends upon the type of soil; it should be made large to avoid a steep slope. It may be necessary to provide steps up the slope.
- The mound latrine is closed as described above.

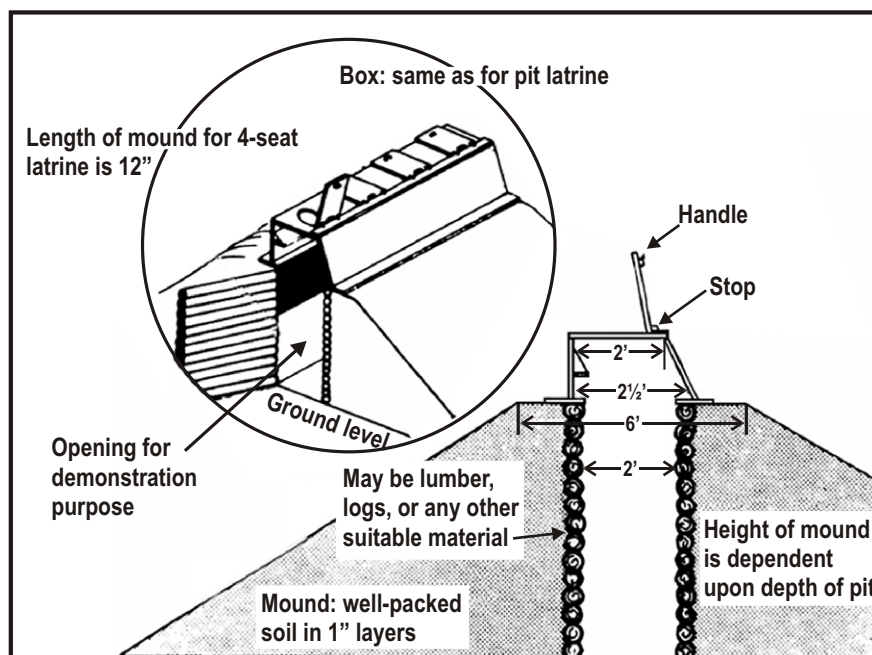


Figure 52: Example of mound latrine

Pail latrine

- A pail latrine may be built when conditions (populated areas, rocky soil, and marshes) are such that a latrine of another type cannot be constructed.
- A four-seat latrine box may be converted for use as a pail latrine by placing a hinged door on the rear of the box, adding a floor, and placing a pail under each seat.
- If the box is located in a building, it should, if possible, be fitted into an opening made in the outer wall so that the rear door of the box can be opened from outside the building.
- The seats and rear door should be self-closing, and the entire box should be made fly proof.
- The floor of the box should be made of an impervious material (concrete, if possible) and should slope enough toward the rear to facilitate rapid water drainage used in cleaning the box.
- A urinal may also be installed in the latrine enclosure with a drainpipe leading to a pail outside. This pail should also be enclosed in a fly proof box.
- The waste in pails may be disposed of by burning or by hauling to a suitable area and burying. Emptying and hauling containers of waste must be closely supervised to prevent careless spillage. The use of plastic bag liners for pails reduces the risk of accidental spillage. The filled bags are tied at the top, then burned or buried.

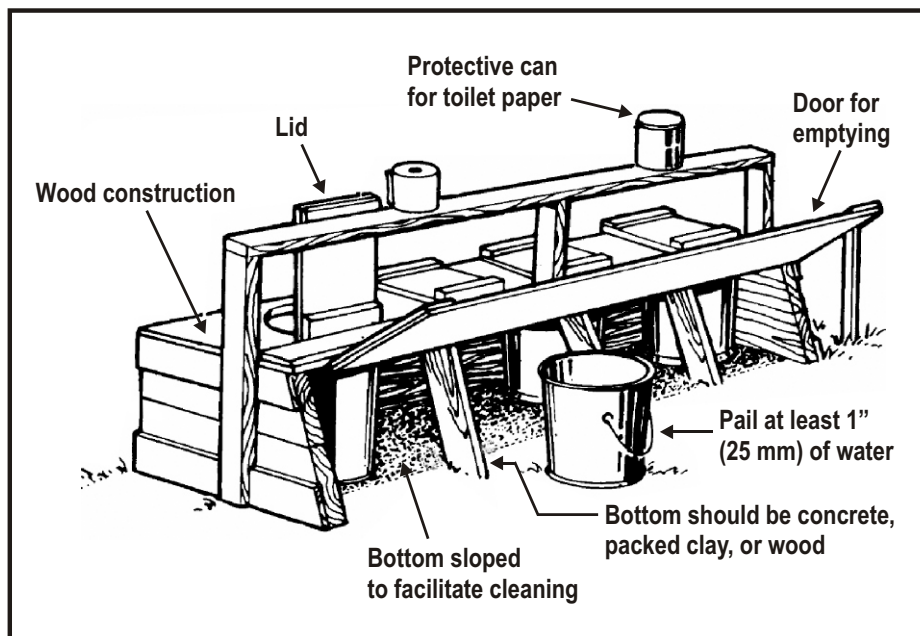


Figure 53: Example of pail latrine

Urine disposal facilities should be provided for the males in the command

- Urine should be drained from the urinals into a soakage pit, into a standard deep pit latrine if the urinals are constructed in conjunction with the latrine, or into the chemical latrine.
- The urine may be drained into a pit latrine through a pipe, hose, or trough.
- If a soakage pit is used, it should be dug 4-ft (1.2-m) square and 4-ft (1.2-m) deep and filled with rocks, flattened tin cans, bricks, broken bottles, or similar nonporous rubble.
- Types of urine disposal facilities
 - Urinal pipes should be at least 1 in (2.5 cm) in diameter and approximately 39-in (1-m) long and placed at each corner of the soakage pit and, if needed, on the sides halfway between the corners.

The pipes are inserted at least 8 in (20 cm) below the surface of the pit with the remaining 28 in (80 cm) slanted outward above the surface.

A funnel of tar paper, sheet metal, or similar material is placed in the top of each pipe and covered with a screen.

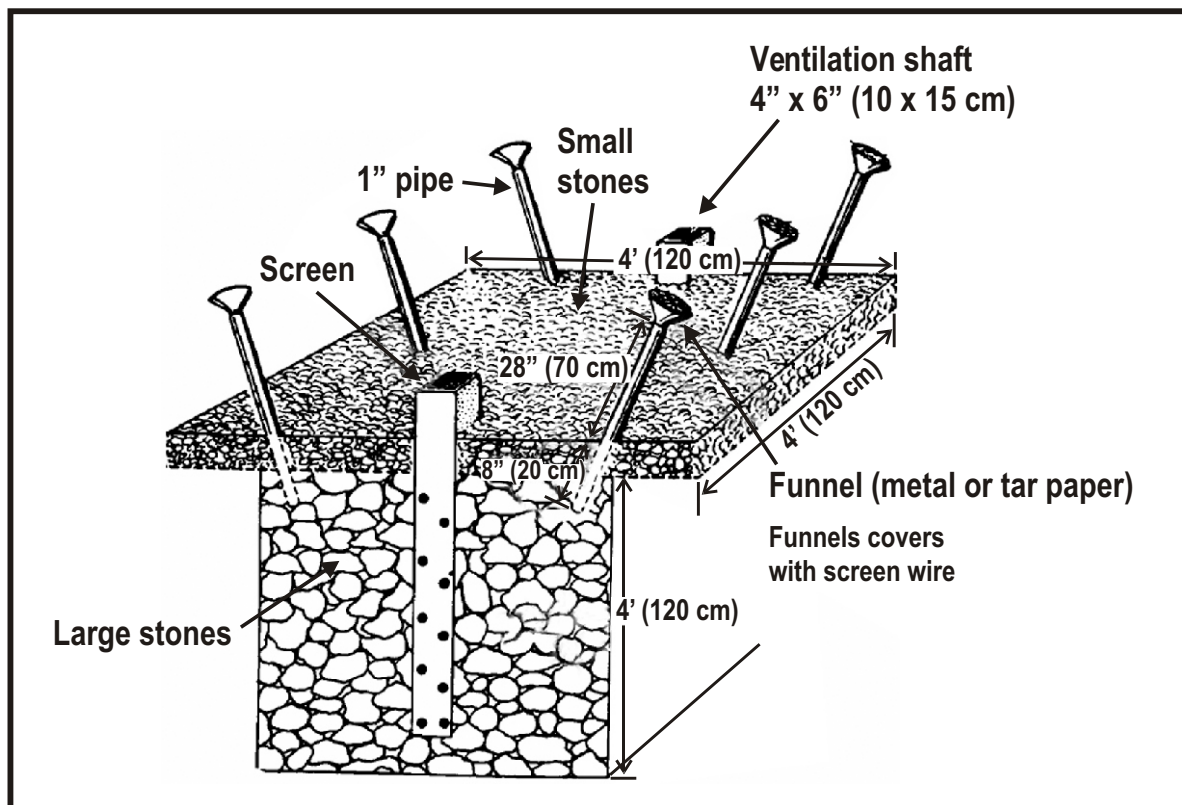


Figure 54

- ° A urinal trough, about 10-ft (3.3-m) long, is provided when material for its construction is more readily available than pipes.

The trough is made of sheet metal or wood with either V- or U-shaped ends. If the trough is made of wood, it is lined with tar paper or metal.

The legs supporting the trough are cut slightly shorter on one end where a pipe carries the urine into the soakage pit or latrine pit.

A urinal trough about 12-in (30-cm) long is attached to the inside wall of the chemical latrine. A pipe is connected to the trough to drain urine into the latrine holding tank.

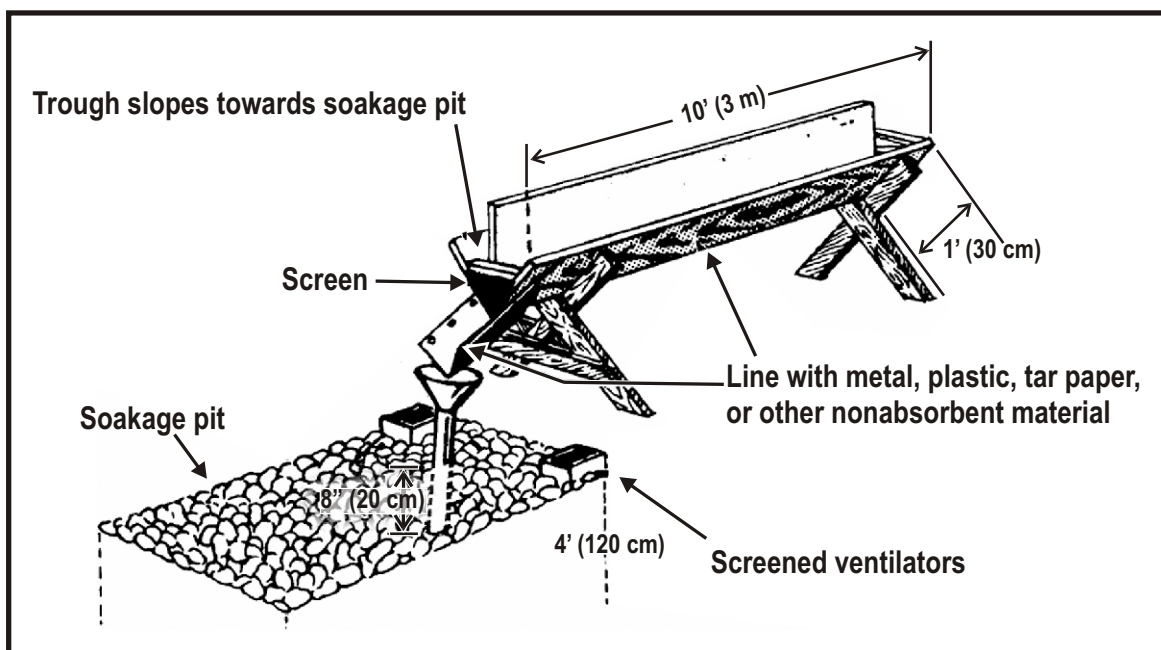


Figure 55

For the urine soakage pit to function properly, Soldiers must not urinate on the surface of the pit.

The funnels or trough must be cleaned daily with soap and water and the funnels replaced as necessary.

Oil and grease must never be poured into the pit, as they will clog it.

When a urine soakage pit is to be abandoned or it becomes clogged, it is sprayed with a residual insecticide and mounded over with a 2-ft (60-cm) covering of compacted earth.

- ° In areas where the ground water level is more than 3 ft (1 m) below the surface, the urinoil is an acceptable substitute for other types of urine disposal facilities.

The urinoil is a 55-gallon drum designed to receive and trap urine and to dispose of it into a soakage pit.

Urine voided through the screen onto the surface of the oil immediately sinks through the oil to the bottom of the drum.

As urine is added, the level rises within the 3-in diameter pipe and overflows into the 1 1/2-in diameter pipe through the notches cut in the top of this pipe.

The oil acts as an effective seal against odors and against fly entrance. The screen on top of the oil is lifted by supporting hooks and cleaned of debris as necessary.

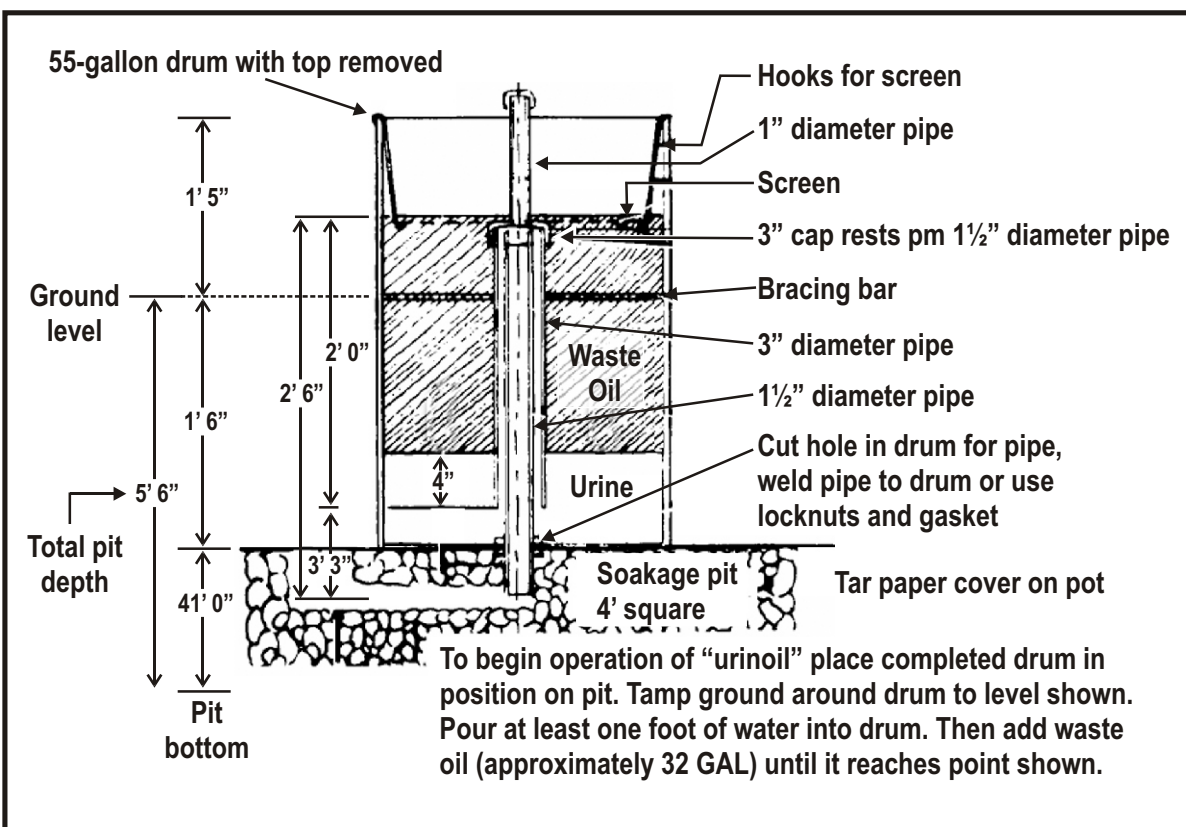


Figure 56

TYPES/CONSTRUCTION OF HAND-WASHING STATIONS

At a minimum, hand-washing stations must be set up in the vicinity of latrines and field kitchens/food service areas. Ideally, any food service area should have two separate stations, one for Soldiers eating at the facility to utilize prior to receiving food and a second area for field kitchen personnel to wash their hands as necessary when preparing food. A second station solely for the use of kitchen personnel ensures frequent and convenient hand washing for the kitchen staff. If available the unit food service section should use the food sanitation center (FSC) for this purpose. Setting up these stations is a unit field sanitation responsibility. Ensuring that Soldiers use these facilities is a leadership and discipline issue and must be enforced by all leaders.

Ideally potable water is used in hand-washing devices. Use of non potable water that has not been treated or sanitized may allow disease and bacteria to spread.

Soap is a must for these stations. Either liquid or bar soap is acceptable. If bar soap is used, it is recommended that it be attached to the hand-washing station by a rope or string tied through a hole punched in the middle of the soap to keep it from falling to the ground.

Commercial facilities

Various commercial portable hand washing facilities are available and in common use in Iraq today (field hand-wash station [olive drab], NSN 7360-01-8487 and field hand-wash station [desert sand], NSN 7360-01-7512). The key to these devices is good preventive maintenance checks and services (PMCS) and ensuring the devices are refilled frequently.



Figure 57: Field hand wash station

Five-gallon tipping cans and No. 10 can hand-washing devices

A hand-washing facility suitable for installation near latrines or food service areas is the easily improvised 5-gallon water can or the No. 10 can hand-washing device. The cap of the five-gallon can or No.10 can may be perforated with $\frac{1}{4}$ -inch holes to conserve washing water. A small can may be used as a dipper and an open oil drum can serve as a clear water reservoir. A soap dish can be fabricated using a small can that has been split and the sharp edges turned down.

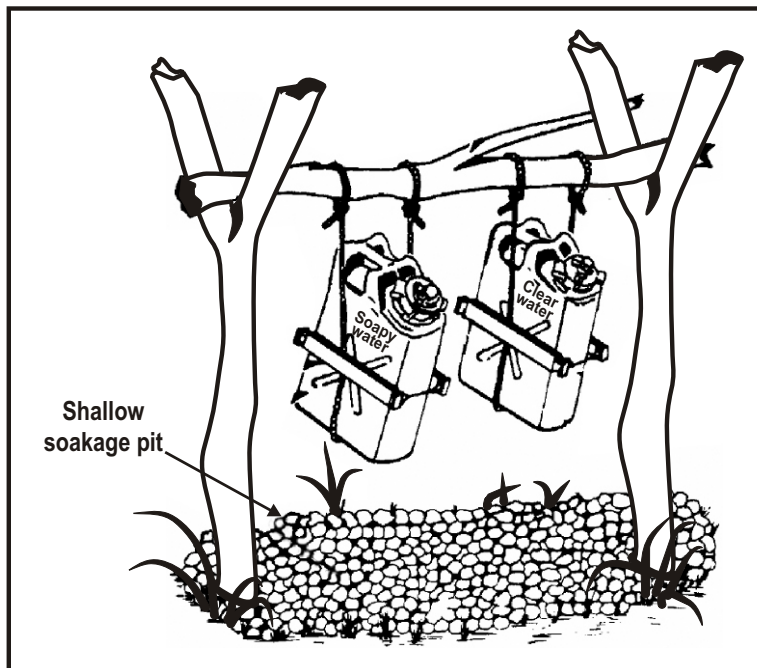


Figure 58

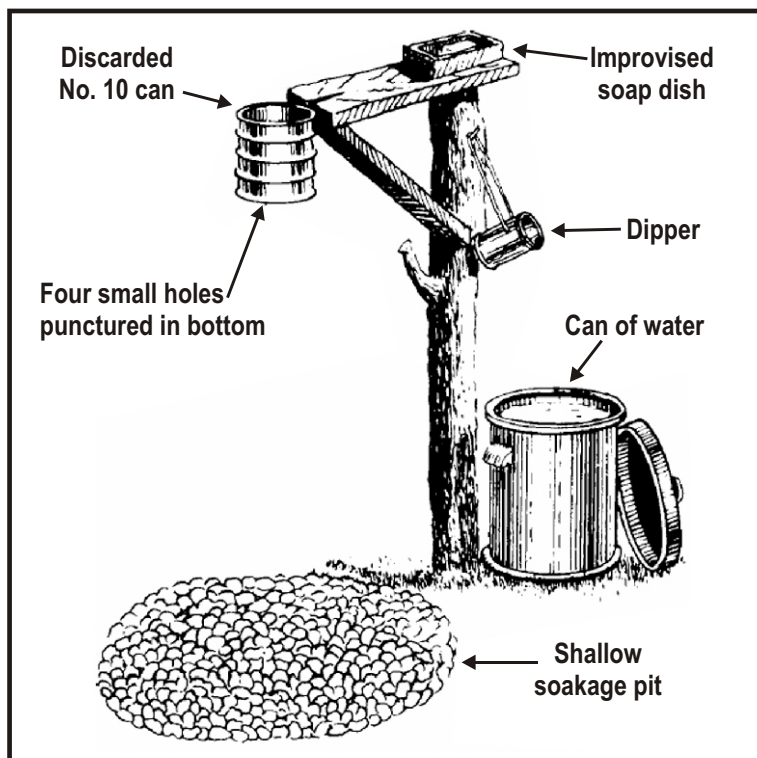


Figure 59

GARBAGE DISPOSAL

Garbage is disposed of by burial or incineration. Tactical requirements must be considered in either case. The excavated soil must be concealed. Smoke and flame may not be tolerated in a tactical situation. In a training situation, environmental protection may rule out burning or burying; therefore, garbage will have to be collected and hauled away.

Burial

- Garbage must not be buried within 100 ft (30 m) of any natural source of water, such as a stream or well used for cooking or drinking.
- The garbage burial area should be a reasonable distance from the kitchen to minimize problems with flies, odor, and appearance.
- On a march, in bivouac, or in camps of less than 1-week duration, the kitchen waste is disposed of by burial in pits or trenches.
- Pits are preferred for overnight halts. They are usually dug 4-ft (1.2-m) square and 4-ft (1.2-m) deep. The pit is filled to not more than 1 ft (30 cm) from the top; then it is covered, compacted, and mounded with 1 ft (30 cm) of earth.

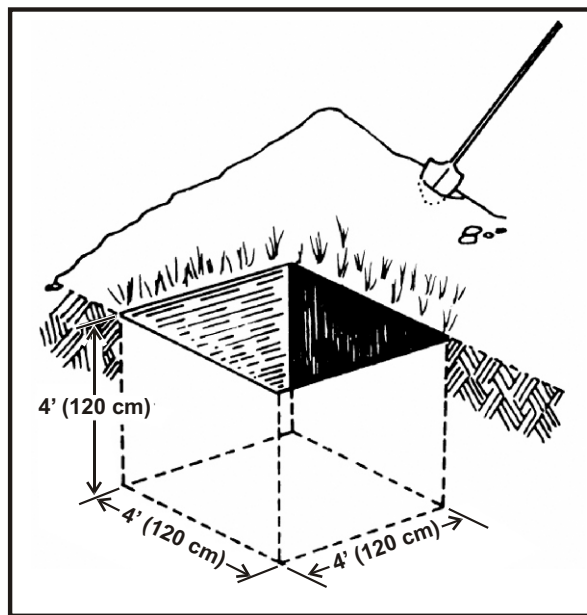


Figure 60

- The continuous trench is more adapted to stays of 2 days or more.
 - Dig a trench about 2-ft (60-cm) wide, 4-ft (1.2-m) deep, and long enough to accommodate the garbage. Fill the trench to not more than 1 ft (30 cm) from the top. The trench is extended as required, and the excavated dirt is used to cover and mound the first deposit.

- ° This procedure is repeated daily or as often as garbage is dumped. It is a very efficient field expedient for disposing of garbage.

Incineration

In temporary camps of 1 week or more, the garbage is often burned in open incinerators. Excellent types of open incinerators may be constructed from materials that are readily available in any camp area.

Since incinerators will not handle wet garbage, it is necessary to separate the solid from the liquid portions of the garbage. Strain the garbage with a coarse strainer such as an old bucket, salvaged can, or oil drum with holes punched in the bottom. Incinerate the solids remaining in the strainer and pour the liquids through a grease trap into a soakage pit. Since field incinerators create an odor nuisance, they should be located at least 50 yd (50 m) downwind from the camp.

- **Barrel incinerator:** The barrel incinerator will effectively take care of the waste produced by a company-sized unit. This is an excellent dry trash incinerator, but wet material tends to disrupt proper draft and does not burn easily.
 - ° Make a stack from an oil drum with both ends cut out or with one end cut out and the other end liberally punched with holes to admit draft air.
 - ° Punch holes through the sides of the drum and insert steel rods to create a grate.
 - ° Set the drum up on rocks, bricks, or other nonflammable material.
 - ° Build a fire under the drum and add the waste, one shovelful at a time, on top of the grate.

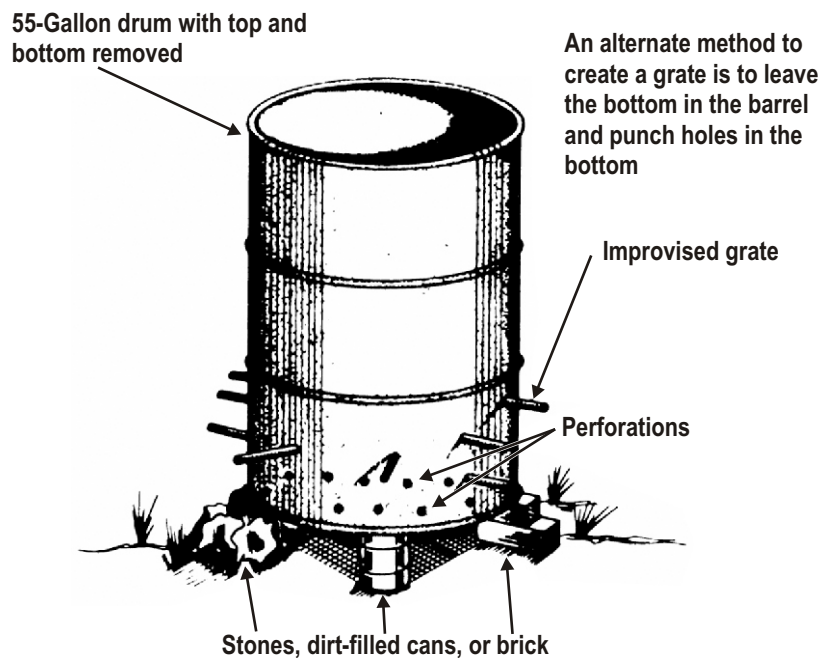


Figure 61

- **Inclined plane incinerator:** The inclined plane incinerator will dispose of the garbage of an entire battalion, combat support hospital (CSH), or other unit of similar size. Its effectiveness in combustion and the fact that it is not affected by rain or wind make it an excellent improvised device. However, building the incinerator requires time and skill.
 - Insert a sheet metal plane through telescoped oil drums from which the ends have been removed.
 - Build a loading or stoking platform and fasten one end of the plane-drum device to it creating an inclined plane.
 - Position a grate at the lower end of the plane and build a wood or fuel oil fire under the grate.
 - After the incinerator becomes hot, place drained garbage on the stoking platform.
 - As the garbage dries, it is pushed down the incline in small amounts to burn. Final combustion takes place on the grate.

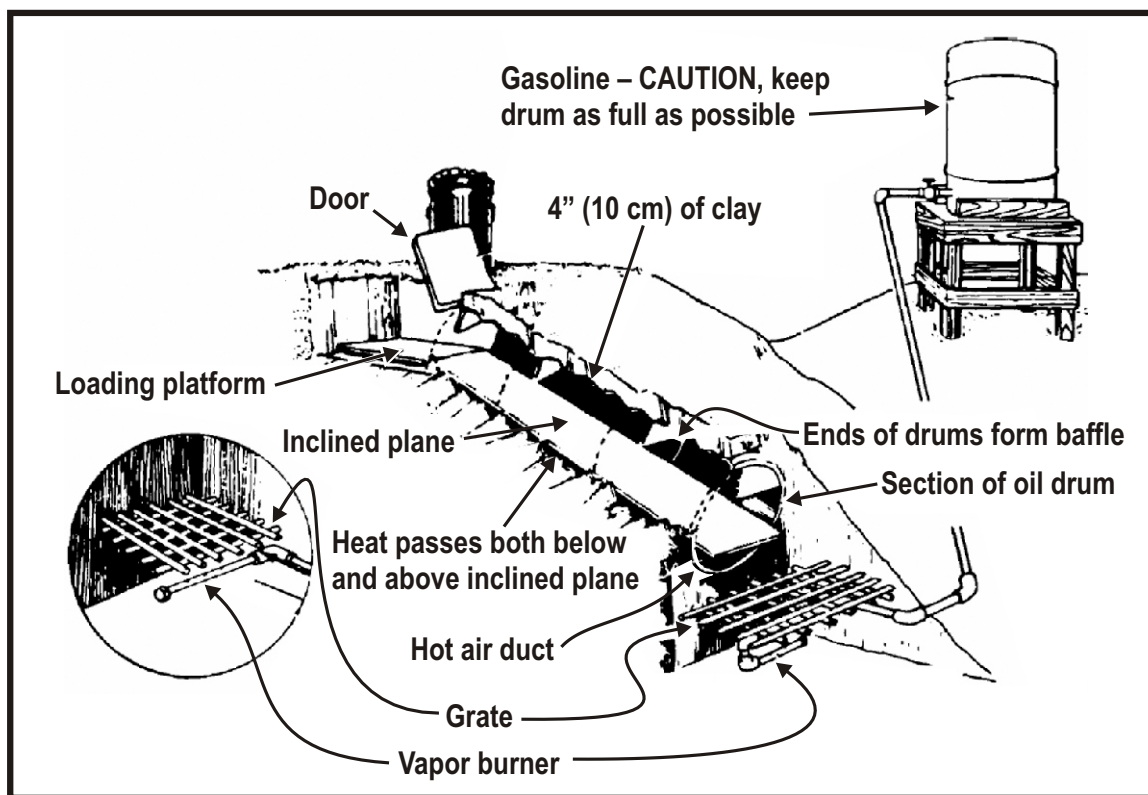


Figure 62

LIQUID WASTE DISPOSAL

Kitchen waste

Liquid kitchen waste accumulates at the rate of 1 to 5 gal(4 to 19 L) per man per day. The two standard methods of disposing of liquid kitchen waste are soakage pits and soakage trenches.

- **Soakage pits:** The liquid kitchen waste is disposed of in the soil by means of soakage pits at or near the place where it is produced. A soakage pit for the disposal of kitchen waste is constructed in the same manner as the soakage pit for urine disposal except that it is equipped with a grease trap. (See below.) Two pits are needed for a company, so that each one can have a rest period every other day. In porous soil, a soakage pit 4-ft (1.2-m) square and 4-ft (1.2-m) deep will take care of 200 gal (760 L) of liquid per day. In camps of long duration, each soakage pit should be given a rest period of 1 week every month. Even though precautionary measures are taken, a pit may become clogged with organic material.

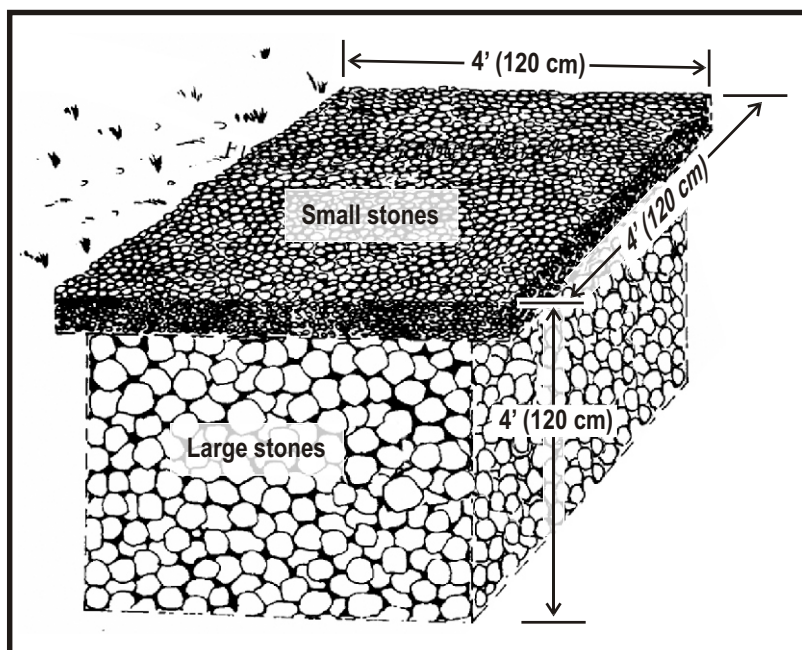


Figure 63

- **Soakage trenches:** If the ground water table is high or a rock stratum is encountered near the surface, soakage trenches may be substituted for soakage pits.
 - These trenches are extended outward from each corner of a central pit dug 2-ft (60-cm) square and 1-ft (30-cm) deep.
 - The trenches are dug 1-ft (30-cm) wide and 6-ft (2-m) or more long. The depth is increased from 1 ft (30 cm) at the end joining the pit to 18 in (45 cm) at the outer end.

- The pit and the trenches are filled with rock, flattened cans, broken bottles, or other coarse contact material.
- Two such units should be built for every 200 persons fed, and each unit should be used on alternate days.
- **Grease pit:** The grease pit is a necessary addition to the kitchen soakage pit and trenches. All kitchen liquids are passed through a grease trap to remove food particles and as much grease as possible; otherwise the soakage pits become clogged and useless. There are two types of grease traps: the filter and the baffle.

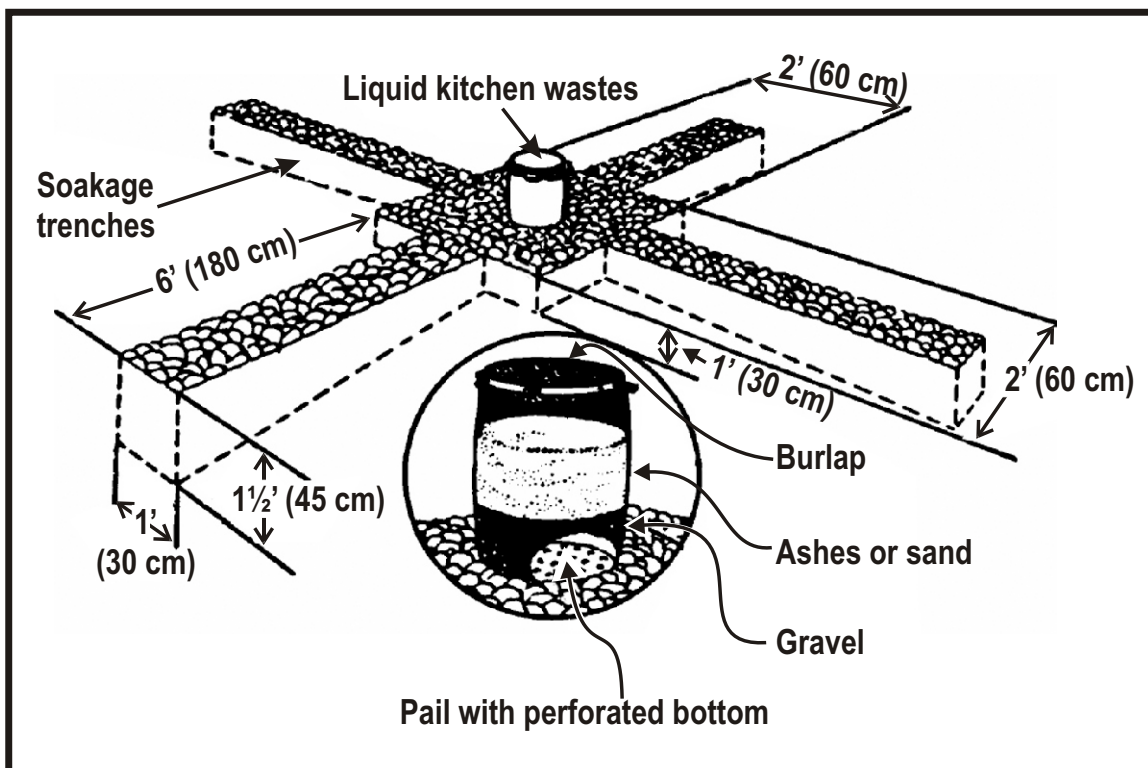


Figure 64

◦ **Filter grease trap:**

An oil drum with the top removed and the bottom perforated is filled two-thirds full with crushed rock or large gravel at the bottom, followed by gravel which has been graded to smaller sizes and then a 6-in (15-cm) layer of sand, ashes, charcoal, or straw.

The top of the drum is covered with burlap or other fabric to strain out the larger pieces of debris. The burlap or other fabric is removed daily, burned or buried, and replaced with a clean piece.

The 6-in layer of filtering material is removed at intervals of once or twice weekly and buried.

The barrel is usually placed in the center of the soakage pit with the bottom of the barrel about 2 in (5 cm) below the pit surface.

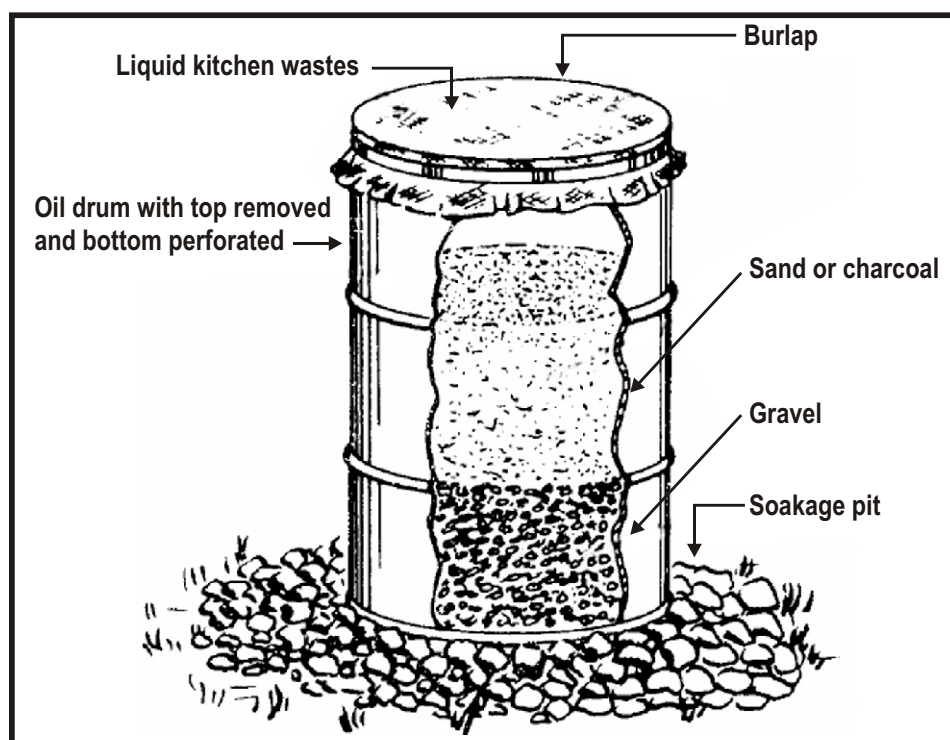


Figure 65

- **Baffle grease trap:** The baffle grease trap is the most effective way of removing grease. It is a watertight container divided into entrance and exit chambers by a baffle, the entrance chamber having about twice the capacity of the exit chamber.

The lower edge of the baffle hangs within 1 in (2.5 cm) of the bottom.

The outlet, a 2-in (5-cm) pipe, is placed from 3 to 6 in (7.5 to 15 cm) below the upper edge of the exit chamber.

The baffle grease trap is usually placed on the ground at the side of the soakage pit with the outlet pipe extending 1 ft (30 cm) beneath the surface at the center of the pit.

The liquid waste is strained of solids and debris before it goes into the entrance chamber of the trap.

The strainer is filled two-thirds full with loose straw, hay, or grass.

Before the grease trap is used, the chambers are filled with cool water. When warm liquid strikes the cool water in the entrance chamber, the grease rises to the surface and is prevented by the baffle from reaching

the outlet to the soakage pit. If the water is warm, proper separation of the grease will not occur. This is often the case in hot climates.

The grease retained in the entrance chamber is skimmed from the surface of the water daily or more frequently, as required, and buried.

The trap should be emptied and thoroughly scrubbed with hot, soapy water as often as necessary.

The efficiency of this grease trap can be increased by constructing it with multiple baffles. Also, a series of baffle grease traps may be used.

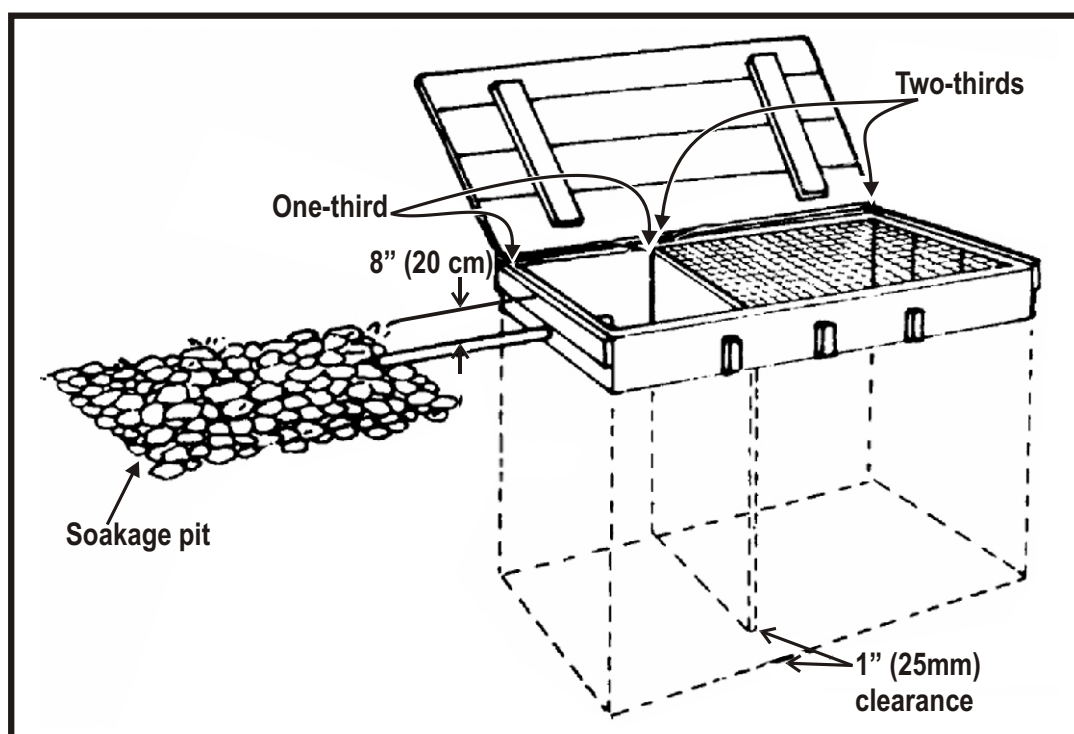


Figure 66

- **Evaporation beds:** In a hot, dry climate where heavy clay soil prevents the use of standard soakage pits, evaporation beds may be required. These beds actually involve the processes of evaporation, percolation, and oxidation.
 - Sufficient beds, 8 by 10 ft (240 by 300 cm), are constructed to allow 3 square ft (2,787 sq cm) per person per day for kitchen waste and 2 sq ft (1,858 sq cm) per person per day for bath waste.
 - The beds are spaced so that the wastes can be distributed to any one of the beds.
 - The beds are constructed by scraping off the topsoil and constructing small dikes around the 8- by 10- ft (240- by 300- cm) spaces.

- ° These spaces are then spaded to a depth of 10 to 15 in (25 to 38 cm) and the surfaces are raked into a series of ridges and depressions with the ridges approximately 6 in (15 cm) above the depressions. These rows may be formed either lengthwise or crosswise as deemed desirable for best distribution of water.
- ° In operation, one bed is flooded during one day with liquid waste to the top of the ridges which is equivalent to an average depth over the bed of 3 in (7.5 cm); the liquid waste is allowed to evaporate and percolate.
- ° After about 4 days, this bed is usually sufficiently dry for re-spading and reforming. The other beds are flooded on successive days and the same sequence of events is followed.
- ° Careful attention must be given to proper rotation and maintenance.
- ° It is also essential that the kitchen waste be run through an efficient grease trap (see above) before it is allowed to enter the evaporation beds.
- ° If these beds are used properly, they create no insect hazard and only a slight odor.

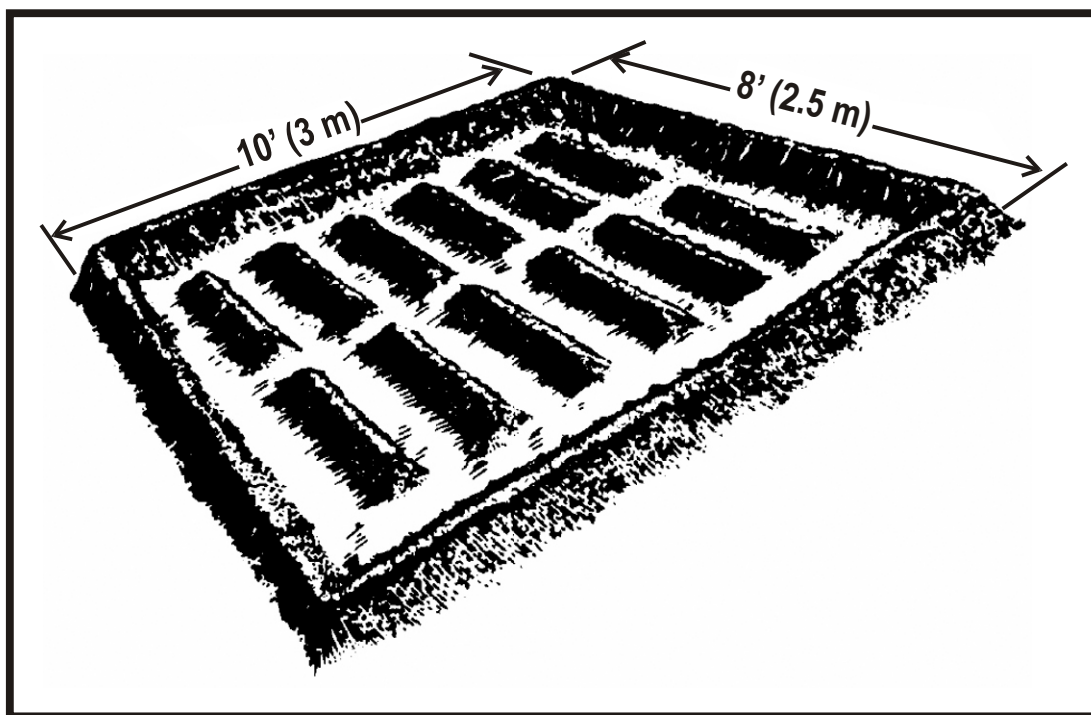


Figure 67

Bath and wash water waste

Bath and wash water is disposed of in the same manner as liquid kitchen waste.

SECTION C: ARTHROPOD/RODENT/ANIMAL CONTROL

ARTHROPODS

Less than 1 percent of the 750,000 species of arthropods (insects, ticks, mites, spiders, scorpions, and the like) are potentially dangerous to humans. However, their impact is significant due to their ability to inflict direct injury and transmit disease to man and other animals, damage crops, infest stored products, and destroy wooden structures. Protecting Soldiers from arthropods and arthropod-borne diseases is essential to mission accomplishment.

Arthropods transmit some of the most serious diseases known to man. Uncontrolled, these illnesses can cripple or destroy military forces.

House flies

The arthropod of most concern to the Army is the common housefly. The principal breeding place of houseflies is in moist organic materials, such as piles of garbage, rotting vegetables, manure, decaying animal matter, sewage, and if we allow it, our food. They will even breed in the soil where liquids from garbage cans or garbage can wash racks have drained. The flies hatch during warm weather or inside at any time when a good breeding place is available. House flies and other flying insects that are attracted to human wastes or other organic material can spread disease organisms to food and water. The disease organisms or parasites of humans are carried from diseased humans or animals (reservoirs) by arthropods (vectors) to other humans or animals (hosts). By employing individual PMM, Soldiers can stop arthropod-borne diseases from affecting their lives and/or their unit's ability to accomplish the mission.

The fly transmits disease germs indirectly. When a fly walks over filth, some of the material sticks to its hairy body. If disease organisms are present, they also stick to the fly's body. The housefly cannot chew so it vomits on food to soften it. The vomit may spread contaminants on the food. When the fly feeds on the waste material, it also ingests bacteria that may be in the waste. The fly then buzzes off to the kitchen area, where it walks over the food and utensils. As the fly walks, some of the bacteria are brushed off its body and onto the food or utensils. Bacteria are also spread with the fly's excreta (fly specks).

Flies transmit the organisms of more than 30 diseases, such as dysentery, salmonellosis, typhoid fever, tuberculosis, cholera, and even pin worms. A single fly can carry as many as 6 million bacteria on the outside of its body and as many as 25 million in its intestines. It is easy to see how flies carry bacteria and spread disease and why it is important to control flies.

Other insects

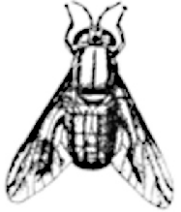
Visual ID	Common Name	Genus	Diseases
	Biting midges	Culicoides	– Visceral filariasis (mansonellosis) – Oropouche fever
	Body lice	Pediculus	– Epidemic typhus – Relapsing fever – Trench fever
	Black flies	Simulium	– Onchocerciasis
	Bot flies	Dermatobia	– Myiasis
	Deer flies	Chrysops	– Eye worm disease (loa loa) – Tularemia

Figure 68

Visual ID	Common Name	Genus	Diseases
	Fleas	Xenopsylla	– Plague – Murine typhus
	Kissing bugs	Rhodnius, Triatoma, Panstrongylus	– Chagas' disease (American trypanosomiasis)
	Mites Chigger mites Mouse mites	Leptothrombidium Sarcoptes Lyponyssoides	– Scrub typhus – Scabies – Rickettsialpox
	Mosquitoes	Aedes Anopheles Culex, Aedes All three	– Dengue – Yellow fever – Viral encephalitis – Malaria – Viral fevers (Oropouche, Rift Valley, Chickungunya) – Lymphatic filariasis (Wuchereriasis, Brugiasis)

Figure 69

Visual ID	Common Name	Genus	Diseases
	Sand flies	Lutzomvia, Phlebotomus	– Leishmaniasis – Sand fly fever – Bartonellosis
	Ticks Hard ticks	Dermacentor	– Spotted fevers – Colorado tick fever
	Soft ticks	Ixodes	– Lyme disease – Babesiosis – Viral encephalitis – Tularemia
		Amblyomma Ixodes	– Human ehrlichioses
		Hyalomma	– Crimean-Congo hemorrhagic fever
		Ornithodoros	– Relapsing fever
	Tsetes	Glossina	– Trypanosomiasis (African sleeping sickness)
	Tumbu flies	Cordylobia	– Myiasis

Figure 70

ARTHROPOD CONTROL MEASURES

Site location and PMM

The most effective and obvious means of preventing exposure to insects is to avoid their known habitats. Absolute avoidance of arthropod pests is often neither practical nor possible. If the tactical situation allows, choose bivouac sites that are dry, open, and as uncluttered as possible. Avoid sites with rodent burrows and proximity to local settlements, animal pens, and other areas where arthropod infestations are likely to be concentrated. Bivouac sites are selected according to well-defined guidelines. The ideal location for a bivouac site is on high, well-drained ground at least 1 mi (1.6 km) from breeding sites of flies and mosquitoes and 1 mi (1.6 km) from native habitations. It is not always possible to bivouac in the ideal location. A unit commander may be faced with unusual arthropod control problems in the vicinity of his campsite.

An effective program for arthropod-borne disease prevention should consist primarily of sanitation measures, but may include the use of individual PMM, such as bed nets, as well as the application of pesticides. Essential to the operation of an effective control program is an understanding of the life cycles and habitat of medically important arthropods. The most familiar PMM are screening doors and windows in garrison and using mosquito netting in the field. Screening is effective only when the screens are kept in good repair and all openings are actually screened. Air curtains may be used at doors that are used a great deal or where screens are not practical. Electric flying insect control devices may also be used when following procedures outlined in **TB MED 530, *Occupational and Environmental Health Food Service Sanitation***. A routine should be established for the control of insects that find their way into the establishment. Sprays, baits, and other insecticide formulations are effective, but they must be safe to use and used only as listed on the container label. If one application is recommended, use one only. Insecticides can kill people just as they do flies.

Eliminate breeding places

The best way to control arthropods is to do away with their breeding places. This means that decaying vegetables, animal matter, garbage, and manure piles must be frequently cleaned up and removed. Such material must never be allowed to remain for more than four days. If the breeding places are removed, the arthropod population will be greatly reduced.

Pesticides and repellents

- Pesticides are valuable aids in the control of arthropods. They are used to augment, not replace, field sanitation and individual PMM.
 - Properties. Pesticides are chemical substances. In sufficient quantity, they will kill any animal including man. Exercise sound judgment when using these chemicals. Not only are the chemicals poisonous but other ingredients such as solvents mixed with the chemicals may make them more hazardous. For example, kerosene or fuel oil that is used as a solvent for many modern pesticides makes them more hazardous for humans. The human skin repels water but absorbs oil; therefore, the pesticide is absorbed with the oil. Refer to the pesticide label for specific protective clothing recommendations and safety precautions and instructions/directions. Use the material safety data sheets (MSDS) issued with each chemical. The MSDS gives the details on the danger associated with chemicals. It also provides information on safety, the way to handle the chemicals, emergency response techniques, health effects, and storage and proper disposal information. For additional information on

precautions see **FM 8-500, *Hazardous Materials Injuries, A Handbook for Prehospital Care.***

- Arthropod resistance. Some arthropods, particularly those that reproduce rapidly, often become resistant to the pesticide that is being used. When this is suspected, preventive medicine personnel should be notified. Suspect pest resistance to insecticides if despite the fact that chemicals are applied properly, proper sanitation is in effect, and pest exclusion practices are used, the pest population is not controlled.
- Disposal. All pesticides, pesticide containers, and pesticide-related waste will be disposed of in accordance with product label instructions. The label instructions comply with Environmental Protection Agency requirements. In the event a product is found without label instructions, consult supporting preventive medicine personnel for guidance.
- Repellents and pesticides can be acquired rapidly by calling the Emergency Supply Operations Center (ESOC) at the Defense Supply Center of Richmond (DSCR), 8000 Jefferson Davis Highway, Richmond, VA 23297-5000, at DSN 695-4865; commercial (804) 279-4865. The Center provides emergency supply needs 24 hours a day, 7 days a week.

RODENTS

Rats are especially harmful to man and domestic animals as carriers of disease. The more important diseases are discussed below:

- **Plague:** The bacillus *Yersinia pestis* causes plague. It is primarily a rodent disease transmitted by fleas. Man acquires the disease through contact with infected fleas or animal tissue. The disease is found in many parts of the world.
- **Murine typhus:** Murine typhus is a rickettsial infection (*Rickettsia mooseri*) transmitted by infected flea feces. Itching from fleabites causes the victim to scratch, thereby rubbing flea feces into the skin.
- **Leptospirosis:** Rat borne leptospirosis is caused by a spirochete, *Leptospira icterohemorrhagiae*, which lives in the rat's kidneys and is shed in the urine. Man contracts the disease by swimming in contaminated water; by contacting moist infected soil; by touching rat smears which contain infected urine; or by coming in contact with infected animal tissues.
- **Salmonellosis:** Rats and mice are most commonly infested with *Salmonella typhimurium* and infected with salmonella enterocolitis which is spread to man through the infected feces and urine of rats and mice. Infection most commonly occurs as the result of contaminated food or food preparation on contaminated surfaces. Mice are probably more important than rats in the transmission of these diseases. Mice and rats can mechanically transmit other types of pathogens from waste to food.
- **Rickettsialpox:** Rickettsialpox is a mild infection caused by *Rickettsia akari* which is transmitted from mice to man by the bite of the house-mouse mite, *Liponyssoides sanguineus*.

- **Hantavirus:** Hantavirus infects rodents worldwide. Several species have been known for some time to infect humans with varying levels of severity. Their primary effect is on the vascular endothelium and results in increased vascular permeability, hypotensive shock, and hemorrhagic manifestations.

RODENT CONTROL MEASURES

Basic control measures

- **Rodent surveys:** Rodents can be a problem in any structure that Soldiers inhabit, especially where there is food, water, and shelter (harborage) present. An active rodent survey program should be conducted to look for signs of rodent infestations. These signs include sightings of live or dead rodents, droppings, smudge marks, tracks, gnawings, burrows/holes, nests, sounds, and odors. The earlier an infestation is detected, the easier it is to eliminate.
- **Eliminate food:**
 - Deny access to garbage by using cans with tight-fitting lids, secured to prevent dislodging by animals. Dispose of garbage and clean garbage cans regularly.
 - Store foodstuffs in rodent-proof containers and require unit personnel to store personal food in tightly covered containers.
 - Clean up all spilled foods.
- **Eliminate water:**
 - Repair leaking water trailers.
 - Drain low spots where runoff forms puddles.
 - Eliminate water-holding items such as old tires, cans, and other refuse.
- **Eliminate harborage:** Rodents rely on concealment for protection while traveling, feeding, and resting. They avoid well-lighted and open spaces as much as possible.
 - Clean up debris, rubble, building materials, and trash.
 - Thin or remove dense vegetation; keep fence lines clear of thick growing vines and shrubs.
 - Minimize weeds, shrubs, and grass adjacent to buildings and tentage.
 - Trim tree limbs that overhang roofs.
 - Keep areas free of clutter and debris.
 - Stack stored materials away from walls.
 - Deny access to potential nesting materials such as paper, cloth, and straw.

- **Trap rodents:**

- Snap traps can be used to kill rodents in situations where poison baits cannot be used (such as around food) and where rodent infestations are not excessive. Effective trapping depends on putting the traps where rodents will contact them. The best locations are against walls, behind or under objects, and other places where rodents may hide. Based on the range of these rodents, rats traps should be placed about 15 to 30 ft (4.5 to 9 m) apart.
- Meat baits, such as hot dogs or bacon, are effective for Norway rats, while nuts and dried fruits may be best for roof rats. Peanut butter, plain or mixed with grain (rolled oats), works well for house mice and all species in general. Testing a variety of baits can aid in determining bait preference and increasing trap success.
- Large numbers of traps placed in or near rodent runways, for a short period are more effective than a few traps over a longer time. Bait must be securely fastened to the trap trigger mechanism. Traps must be checked and reset daily.

Rodent pesticides

The field sanitation teams will not use chemicals in food areas for rodent control. Personnel with specialized training must perform this work. Also, chemicals will not be stored near food. Instances have occurred where rodent control baits (rodenticides) were mistaken for food and were consumed by humans.

- **Rodent bait stations:**

- Both single and multiple dose baits are available for use by the field sanitation team.
- Single dose baits remove dominant rats that prevent others from feeding at the bait station. They should be used initially for about 2 days, then switch to multiple dose baits for best overall control.
- The action of multiple dose rodenticides is cumulative; rodents must feed on the anticoagulant-treated bait for several days with not more than 48 hours between feedings. Adequate supplies of toxic bait must be kept available until control is achieved. Repeat this pattern weekly until control is achieved.
- Apply baits in locations out of reach of children, pets, domestic animals, and non-target wildlife.
- Bait pellets must be placed in containers NOT scattered over an area. These compounds are considered the safest rodenticides for general use. Notify preventive medicine personnel if rodents are not accepting the bait.
- Containers should be placed next to walls, travel ways, or near their burrows and harborage. Some bait boxes may be large enough so that both water and dry baits can be placed inside. They may be constructed of wood, plastic, or metal.

- The containers should be made tamper proof to prevent people and other animals from tipping them over and spilling the bait.
- If properly placed, bait containers provide a secure place for rodents to feed.
- All bait station containers must be labeled with the statement, CAUTION! POISON. Label must be in both English and the local language.

(**Note:** A field expedient method for using bait pellets is to place the right amount in small paper packets [rodents can easily smell and chew through the paper] to keep the bait from being spread over a large area and to make application easier. Make and use these packets only when bait stations are not available, where children and non-target animals will not get them, and where they will not be exposed to precipitation or runoff.)

- **Hand pressure sprayer:** The hand pressure sprayer (1- or 2-gal capacity) is used for most pest control operations. Various makes of this sprayer are available. The instructional manual furnished with each sprayer must be retained and followed concerning its operation and maintenance.

- Prepare sprayer for use

Fill the sprayer with the insecticide and water mixture, but do not exceed 2 gal (7.5 L) and screw the filler cap hand-tight. This permits air space for building up air pressure.

Insert the appropriate nozzle for the desired application.

Unlock the pump by turning the handle 90 degrees to the left.

Pressurize the tank to approximately 40 to 60 pounds per sq in (275 to 415 kg per area). If the sprayer does not have a pressure gauge, approximately 30 to 35 pump strokes will usually be sufficient.

To increase pump efficiency and ease of operation, put a few drops of lubricating oil on the pump rod at the beginning of each day's operation. No other lubrication is required.

- Sprayer operation

Operation of the sprayer consists primarily of manipulating the wand of the sprayer to produce an even spray. When a team member is able to cover all of a designated surface with pesticide without it running off the surface, he has mastered the spraying technique. This technique is mastered by means of observation and practice.

All pesticide in the sprayer should be used up on the job.

Never pour excess pesticide on the ground or down the drain.

- Cleaning the sprayer

After each use, flush and triple-rinse the sprayer with water and wipe off the exterior of the sprayer to prevent the pesticide from crystallizing. The crystals will corrode metal, jam the valves, deteriorate the gaskets, and cause the nozzles to malfunction.

Clean the tank and strainers thoroughly any time that the sprayer fails to function properly. Remove the in-line strainer and nozzle strainer, then clean and rinse them thoroughly with water.

° Replacing worn parts.

To replace the piston cup, first remove the pump assembly by pulling the pump handle until the piston rod comes out of the cylinder; then remove the piston-cup screw and retainer and replace the cup with a new one. Place the piston rod into the cylinder, taking care not to damage the piston cup. Replace pump's assembly and tighten securely.

To replace the pump cylinder valve, first remove the pump assembly. Remove the valve if worn and replace with a new one. The valve is a push-on, pull-off type construction. Check for sand, soil, or other material under the valve, and clean if needed. Replace the pump assembly and pump it to check for pressure leaks and buildup. If leaks are found, remove assembly and repair as needed.

To repair the hose, first remove the hose by loosening the hose clamp. Cut off the broken portion from the hose. Put the end of the hose through the hose clamp and on the hose adapter; then screw the hose clamp securely into position. A new hose cut to proper length can be installed by removing both hose clamps and following the procedure outlined above.

Dead rodent disposal

All traps and bait stations must be checked early each morning for dead rodents. The following self-protective measures are essential in disposing of the dead rodents:

- Spread the extended duration DEET insect repellent on your hands and sleeves. Next, apply DEET to the front of your clothing to repel any fleas or other pests left on the rodent which may transmit disease.
- Using a shovel or long-handled tongs and rubber gloves, pick up the dead rodents from the traps and place them in double plastic bags or a metal container that has a tightly fitted lid.
- Dispose of dead rodents according to local regulations or the unit standing operating procedure (SOP).
- Contaminated/dirty snap traps must be sanitized in a 5% hypochlorite solution (household bleach strength) prior to reuse to reduce the chances of spreading rodent borne diseases. (See the table below for preparation of hypochlorite solution.)

Preparation of Hypochlorite Solution		
HTH granules(ounces)	HTH granules(MRE spoonful)	Household bleach
48	40	Full strength

ANIMAL CONTROL MEASURES

Unit field sanitation teams must educate their units concerning the medical threat posed by domestic and wild animals. There are two main controls that unit field sanitation teams can use to control animal populations in and around their base camps:

- Ensure the command enforces a no pet policy on post. Soldier must not be allowed to keep animals (dogs, cats, rats, etc.) as pets.
- Contact veterinary detachments to eliminate animals that are in and around your base camp. (DO NOT KILL THE ANIMALS YOURSELF UNLESS AUTHORIZED BY YOUR CHAIN OF COMMAND.) This is a veterinary function and should be conducted by them. They can also test the animals to see if they are carrying any diseases.

SECTION D: COMBAT STRESS/COMBAT OPERATIONAL STRESS REACTION (COSR)

DESCRIPTION

Many stressors in a combat situation are due to deliberate enemy actions aimed at killing, wounding, or demoralizing our Soldiers and our allies. Other stressors are due to the natural environment, such as intense heat or cold, humidity, and/or poor air quality. Still others are a result of the leaders' calculated decisions about unit strength, maneuver, time of attack, and plans for medical and logistical support. Sound leadership works to keep these operational stressors within tolerable limits and prepares troops mentally and physically to endure them. In some cases, excessive stress can affect both leaders' and Soldiers' decision making and judgment, resulting in missed opportunities, or worse, high casualties and/or failure to complete the mission. Finally, some of the most potent stressors are interpersonal in nature and can be due to conflict in the unit or on the home front. In the extreme, reactions to such stressors may involve harm to self or others. These stressors must be identified and, when possible, corrected or controlled. For information on control of combat stressors and for details about specific leader and individual actions to control stress, see **FM 22-51, *Leaders' Manual for Combat Stress Control*** and **FM 2-22.5, *Combat Stress***.

During actual combat, military operations continue around the clock at a constant pace and often under severe conditions. During such periods, the Soldier's mental and physical endurance will be pushed to the limit. Recognition of combat operational stress reactions (COSR) (formerly called battle fatigue) is the first step in returning the Soldier to normal activities.

COSR is a normal response to the abnormal stress of combat and is the term applied to any combat-related stress reaction requiring treatment. COSR is a temporary emotional disorder or inability to function, experienced by a previously normal Soldier as a reaction to the overwhelming or cumulative stress of combat.

By definition, COSR gets better with reassurance, rest, physical replenishment, and activities that restore confidence. Physical fatigue or sleep loss, although commonly present, is not necessary. Negative behaviors may be stress reactions, but are not called COSR because they

need treatment other than simple rest, replenishment, and restoration of confidence. Negative stress reactions may include behaviors such as drug and alcohol abuse, committing atrocities against enemy prisoners and noncombatants, looting, desertion, and self-inflicted wounds.

COSR is classified as either light or heavy. This classification guides treatment planning depending on the tactical situation and severity of symptoms.

- **Light:** Minimal to mild impairment in functioning; symptoms are present but do not significantly impact duty performance; duty performance complaints are more subjective than objective; tactical situation allows for forward treatment.
- **Heavy:** Obvious impairment in duty performance or tactical situation precludes treatment at unit or forward aid station.

Operational stress reaction (OSR) is the term applied to service members who are psychologically or emotionally disturbed in non-combat situations.

Most emotional reactions to such situations are temporary, and the person can still carry on with encouragement. Painful or disruptive symptoms may last for minutes, hours, or a few days. However, if the stress symptoms are seriously disabling, they may be psychologically contagious and endanger not only the individual but also the entire unit. If self-confidence cannot be restored, the person may become psychologically crippled for life; therefore, early intervention is essential.

Most service members presenting with signs and symptoms of an emotional or psychological disturbance do not have a mental disorder but rather are struggling with the abnormal stress of military operations. Sorting these from the relatively small number that have actual mental disorders is a process called neuropsychiatric triage. In a deployed/operational setting, service members who present for evaluation of emotional or psychological symptoms (or are brought in by the chain of command) do so because of impairment in duty performance, concerns for safety, or both. Always think SAFETY. Have the chain-of-command secure the service member's weapon and send the service member with an escort if there is any concern for safety.

(Note: Any Soldier can suffer combat stress.)

The goals of combat stress treatment are to:

- Be supportive; assist the Soldier in dealing with his stress reaction
- Prevent and, if necessary, control behavior harmful to him and to others
- Return the Soldier to duty as soon as possible after dealing with the stress reaction

REACTIONS TO STRESS

- Emotional reactions.
 - The most common stress reactions are simply inefficient performance, such as:
 - Slow thinking (or reaction time)
 - Difficulty sorting out the important and deciding what needs to be done

Difficulty getting started

Indecisiveness, trouble focusing attention

- Uncontrolled emotional outbursts, such as crying, screaming, or laughing are much less common reactions to a disaster or accident

Uncontrolled reactions may appear by themselves or in any combination (the person may be crying uncontrollably one minute and then laughing the next or he may lie down and babble like a child).

He may run about, apparently without purpose. Inside, he feels great rage or fear and his physical acts may show this. In his anger, he may indiscriminately strike out at others

- Some Soldiers will become very withdrawn and silent and try to isolate themselves from everyone. These Soldiers should be encouraged to remain with their assigned unit.

- Loss of adaptability.

- In a desperate attempt to get away from the danger that has overwhelmed him, a Soldier may panic and become confused.

In the midst of a mortar attack, he may suddenly lose the ability to hear or see.

His mental ability may be so impaired he cannot think clearly or even follow simple commands.

He may stand up in the midst of enemy fire or rush into a burning building because his judgment is clouded, and he cannot understand the likely consequences of his behavior.

He may lose his ability to move (freezes) and may seem paralyzed.

He may faint.

- In other cases, overwhelming stress may produce symptoms that are often associated with head injuries.

For example, the person may appear dazed or be found wandering around aimlessly.

He may appear confused and disoriented and may seem to have a complete or partial loss of memory.

In such cases, especially when no eyewitnesses can provide evidence that the person has NOT suffered a head injury, it is necessary for medical personnel to provide rapid evaluation for that possibility.

DO NOT ALLOW THE SOLDIER TO EXPOSE HIMSELF TO FURTHER PERSONAL DANGER UNTIL THE CAUSE OF THE PROBLEM HAS BEEN DETERMINED.

- Sleep disturbance and repetitions
 - The Soldier may experience nightmares related to the disaster such as dreaming that his wife, father, or other important person in his life was killed in the disaster. Remember that nightmares, in themselves, are not considered abnormal when they occur soon after a period of intensive combat or disaster. As time passes, the nightmares usually become less frequent and less intense.
 - In extreme cases, a Soldier, even when awake, may think repeatedly of the disaster, feel as though it is happening again, and act out parts of his stress repeatedly. For some people, this repetitious re-experiencing of the stressful event may be necessary for eventual recovery; therefore, it should not be discouraged or viewed as abnormal.
 - For the person re-experiencing the event, such reactions may be disruptive and disturbing despite the reassurance that it is perfectly normal. In such a situation, it may be possible to use a process called ventilation, which encourages the person to talk extensively, even repetitiously, about the experience or his feelings. Do not force this process; rather, allow the person repeated opportunities and supportive encouragement to talk in private, preferably to one person.

APPLICATION OF PSYCHOLOGICAL FIRST AID

The emotionally disturbed Soldier has built a barrier against fear. He does this for his own protection, although he is probably not aware that he is doing it. If he finds that he does not have to be afraid and that there are normal, understandable things around him, he will feel safe and drop this barrier. Persistent efforts to make him realize that you want to understand him will be reassuring, especially if you remain calm. Nothing can cause an emotionally disturbed person to become even more fearful than feeling that others are afraid of him. Try to remain calm. Familiar things, such as a cup of coffee, the use of his name, attention to a minor wound, being given a simple job to do, or the sight of familiar people and activities will add to his ability to overcome his fear. He may not respond well if you get excited, angry, or abrupt.

After the Soldier becomes calmer, he is likely to have dreams about the stressful event. He also may think about it when he is awake or even repeat his personal reaction to the event. Eventually, it is difficult to remember how frightening the event was initially. In giving first aid to the emotionally disturbed Soldier, you should let him follow this natural pattern. Encourage him to talk. Be a good listener. Let him tell in his own words what actually happened (or what he thinks happened). If home front problems or worries have contributed to the stress, it will help him to talk about them. Your patient listening will prove to him that you are interested in him, and by describing his personal catastrophe, he can work at mastering his fear. If he becomes overwhelmed in the telling, suggest a cup of coffee or a break. Whatever you do, assure him that you will listen again as soon as he is ready. Do try to help put the Soldier's perception of what happened back into realistic perspective, but DO NOT argue about it.

A person who is emotionally disturbed as the result of combat action or a catastrophe is basically a casualty of anxiety and fear. He is disabled because he has become temporarily overwhelmed by anxiety. A good way to control fear is through activity. Almost all Soldiers, for example,

experience a considerable sense of anxiety and fear while they are poised, awaiting the opening of a big offensive, but they actually feel better once they begin to move into action. They take pride in effective performance and pleasure in knowing that they are good Soldiers, perhaps being completely unaware that overcoming their initial fear was their first major accomplishment

Useful activity is very beneficial to the emotionally disturbed Soldier who is not physically incapacitated. After you help a Soldier get over his initial fear, help him to regain some self-confidence. Make him realize his job is continuing by finding him something useful to do. Encourage him to be active. Get him to carry litters, (but not the severely injured), help load trucks, clean up debris, dig foxholes, or assist with refugees. If possible, get him back to his usual duty. Seek out his strong points and help him apply them. Avoid having him just sit around. You may have to provide direction by telling him what to do and where to do it. The instructions should be clear and simple; they should be repeated; they should be reasonable and obviously possible. A person who has panicked is likely to argue. Respect his feelings, but point out more immediate, obtainable, and demanding needs. Channel his excessive energy, and above all DO NOT argue. If you cannot get him interested in doing more profitable work, it may be necessary to enlist aid in controlling his over activity before it spreads to the group and results in more panic. Prevent the spread of such infectious feelings by restraining and segregating the Soldier, if necessary.

Involvement in activity helps a Soldier in three ways:

- He forgets himself.
- He has an outlet for his excessive tensions.
- He proves to himself he can do something useful.

There are times, particularly in combat, when physical exhaustion is a principal cause for emotional reactions. For the weary, dirty Soldier, adequate rest, good water to drink, warm food, and a change of clothes, and an opportunity to bathe or shave may provide spectacular results.

A person works, faces danger, and handles serious problems better if he is a member of a closely-knit group. Each individual in such a group supports the other members of the group. It is this group spirit that wins games or takes a strategic hill in battle. It is so powerful that it is one of the most effective tools you have in your “psychological first aid bag.” Getting the Soldier back into the group and letting him see its orderly and effective activity will reestablish his sense of belonging and security and will go far toward making him a useful member of the unit.

Treatment summary: proximity, immediacy, expectancy, simplicity (PIES)

- **Proximity:** Treat service member as close to the unit as tactically and symptomatically possible. A violent, out-of-control patient cannot likely be treated at the battalion aid station if the battalion is actively engaged in combat, whereas one who is physically exhausted may be treated in his platoon area during a lull in the fighting.
- **Immediacy:** Do not delay initiation of treatment; treat as soon as symptoms are identified and tactically feasible.
- **Expectancy:** “This will get better. You will return to your unit.” Positively convey the expectation that this condition will improve and that the service member will not be evacuated.

- **Simplicity:** Keep treatment simple. Provide the “Four Rs”:
 - Rest: Provide place and time for adequate rest
 - Reassurance: Reassure service member that this condition will improve with rest and he will soon return to his unit
 - Replenishment: Food, water, hygiene
 - Restoration (of confidence): Keep the service member in his military role—do not emphasize a “patient” role; assign simple tasks and duties such as rehearsing battle drills, checking weapons, etc.

PREVENTING COMBAT STRESS

Combat resiliency or the ability to ward off the impairing features of combat and operational stress is best attained through tough, realistic training; physical stamina; high morale and esprit; strong unit cohesion; and unity of effort. This is a leadership and command responsibility, but medics play an important role in assessing a unit’s combat resiliency.

SECTION E: UNIT FIELD SANITATION TEAM NSN LISTING

SUPPLY ITEMS FOR PREVENTION OF HEAT INJURIES					
ITEM	NSN	UI	AUTH QTY	CL	REMARKS
Wet bulb-globe temperature (WBGT) kit (without tripod) See Note 6	6665-00-159-2218	EA	1/unit	9	Inventory component, replace broken thermometers, clean/replace wick as needed
WBGT black globe thermometer	6685-01-110-4429	EA	1	9	WBGT component replacement as needed
WBGT wet bulb thermometer	6685-01-110-4430	EA	1	9	WBGT component replacement as needed
WBGT dry bulb thermometer	6685-01-110-6563	EA	1	9	WBGT component replacement as needed
WBGT wick; see Note 6		EA	1	9	Use cotton shoestring for replacement
SUPPLY ITEMS FOR PROVIDING POTABLE WATER					
ITEM	NSN	UI	AUTH QTY	CL	REMARKS
*Calcium hypochlorite, 6 oz jar	6810-00-255-0471	BT	1/50 indv	2	Check expiration dates quarterly; see Note 1
Chlorination kit, water purification	6850-00-270-6225	KT	1/15 indv	2	Check expiration dates quarterly
Chlorination kit, water purification	6850-00-2374-9921	KT	1/15 indv	2	Check expiration dates quarterly
Chlorine tests tablets, DPD 1 (100 tablets)	6550-01-044-0315	PG	1	2	Restock chlorination kit as needed
Water purification tablets, chlorine (10 tablets)	6850-01-352-6129	PG	10/indv	2	Check expiration dates quarterly
Water purification tablets, iodine, 8mg (50 tablets)	6850-00-985-7166	BT	2/indv	2	Check expiration dates quarterly; randomly open bottles to inspect that tablets are steel gray.
SUPPLY ITEMS FOR PROVIDING FOOD SERVICE SANITATION					
ITEM	NSN	UI	AUTH QTY	CL	REMARKS
Alcohol swabs, single pads 500s	6510-01-153-4638	BX	1/150 indv	8	
Disinfectant, food service (12 packets)	6840-00-810-6396	BX	1/75 indv	2	Check expiration dates quarterly
Test paper, chlorine residual (10 packages)	6630-01-012-4093	PG	1	2	Check expiration dates quarterly
Thermometer, food	6685-00-444-6500	EA	2	2	Calibrate as per instruction

CENTER FOR ARMY LESSONS LEARNED

SUPPLY ITEMS FOR PERSONAL PROTECTIVE EQUIPMENT (PPE)					
ITEM	NSN	UI	AUTH QTY	CL	REMARKS
Gloves, chemical and oil protective (size 9 or size 11)	8415-01-012-9294 8415-01-013-7384	PR	2/150 indiv	2	Maintain cleanliness, replace when torn
Goggles, industrial non-vented	4240-00-190-6432	EA	2/150 indiv	2	Maintain cleanliness, store to prevent scratching
SUPPLY ITEMS FOR CONTROL OF ARTHROPODS/RODENTS					
Chest, #3 30x18x10, aluminum	6545-00-914-3480	EA	As required to load	9	See Note 2
*Insect repellent, personal application, 2 oz tube (12 tubes/BX)	6840-01-284-3982	BX	4 tubes/indv	9	Visually inspect containers periodically
*Insect repellent, clothing application, IDA kit (12 kits/BX)	6840-01-345-0237	BX		9	Visually inspect containers periodically
*Insect repellent, clothing and bed net treatment, aerosol, 6 oz can (12 cans)	6840-01-278-1336	BX	1 can/indv	9	Visually inspect containers periodically
*Insecticide, Demand Pestab, 10% tablets, unit dose (40 tablets/CO)	6840-01-431-3357	CO	1/150 indiv	9	Visually inspect containers periodically; see Note 3
*Insecticide, d-phenothrin 2 %, aerosol, 12 oz	6840-01-412-4634	CN	1/10 indiv	9	Visually inspect containers periodically
Mouse trap, spring, indiv (12 traps/BX)	3740-00-252-3384	DZ	4 dz/150 indiv	9	Maintain/clean as needed
Rat trap, spring	3740-00260-1389	DZ	4 dz/150 indiv	9	Maintain/clean as needed
*Rodenticidal bait, anticoagulant, 0.005% diphacinone (40 blocks/BX)	6840-00-089-4664	BX	1/150 indiv	9	Visually inspect containers periodically
*Rodenticidal bait, anticoagulant, 0.005% brodifacoum (Talon-G) 11 lb can	6840-01-428-4808	CN	1/150 indiv	9	Visually inspect containers periodically; see Note 2
*Rodenticidal bait, anticoagulant, 0.005% bromadiolone (Maki pellets) 11 lb can	6840-01-151-4884	CN	1/150 indiv	9	Substitute for 6840-01-4808; visually inspect containers periodically; see Note 2
Container, rodent bait, plastic, tamper-proof, capable of dispensing solid or granular bait. Part No. 05830 (6/BX)	3740-01-423-0737	BX	4 dz/ indiv	9	Maintain/store properly as per manual instructions.
Sprayer, insecticide, manually carried, 2 gal	3740-00-641-4719	EA	1/150 indiv	9	Maintain/store properly as per manual instruction; see Notes 4 and 5
Sprayer, insecticide, manually carried, 1 gal	3740-00-191-3677	EA	1/150 indiv	9	Substitute for 3740-00-641-4719; see Notes 4 and 5
Swatter, fly	3740-00-252-3383	DZ	1/150 indiv	9	

*Indicates items with special handling instructions (See **Notes** on following page.)

Note 1: Pesticides should be properly stored. Additionally, pesticides should be packed in air-transportation over pack containers to facilitate division into teams. Refer to TM 38-250 for additional guidance on air transportation of pesticides. The International Air Transportation Association's "Shippers Declaration for Dangerous Goods" form must be used for air transport of those pesticides which are regulated.

Note 2: Due to shelf life considerations, DO NOT prestock. Order on a priority basis prior to anticipated deployment. For emergency procurement contact: Defense Supply Center, Richmond (DSCR) Emergency Supply Operations Center (ESOC) at DSN 695-4865 or commercial (804) 279-4865. This ESOC is staffed 24 hours a day 7 days a week.

Note 3: Demand Pestab replaces chlorpyrifos, 40 ml bottle (Dursban LO), 6840-01-210-3392. Dursban LO may be used until stock is exhausted.

Note 4: Three sets of repair parts should be acquired for each sprayer. Repair parts will include items such as check valves, pressure cups, filters, O-rings, four-way nozzles with crack and crevice tips. Repair parts may be ordered from sprayer manufacturer by part number as Class IX repair parts.

Note 5: All sprayers should be equipped with pressure gauge. If not, order a pressure gauge, NSN 3740-01-332-8746, and filter NSN 4330-01-332-1639, to retrofit sprayers.

The Sigma Products and Manufacturing Company, Incorporated, 3324 Blue Jay Pass, Fort Mill, SC, 29708, is the single source provider for the following individual replacement parts within the WBGT kit. Some of the items are not listed with NSN and must be ordered directly. To receive specific details and current pricing, contact the company either through the web site www.wetglobe.com or by calling 1-800-215-0440.

WET BULB GLOBE TEMPERATURE KIT AND REPLACEMENT PARTS	
PART NUMBER	DESCRIPTION
60130/t	WBGT kit with tripod (NSN 6665-01-381-3023)
601301	WBGT kit (NSN 6665-00-159-2218)
6013-7755	Refurbish kit (complete internal assembly)
5096-2501	Black globe thermometer (NSN 6685-01-110-4429)
5096-2401	Wet bulb thermometer (NSN 6685-01-110-4430)
5096-2402	Dry bulb thermometer (NSN 6685-01-110-6563)
6013-0143	Airflow reducer vial
6013-0145	Water reservoir
7200-0020	Wicking
6013-0142	Black cooper sheath
6013-0199	Tripod
6013-0140	Calculator (NSN 6665-01-109-3246)

SECTION F: COLLECTIVE LESSONS LEARNED

Issue: Units requesting field sanitation supplies from preventive medicine detachments.

Discussion: Units have consistently requested logistics support from preventive medicine detachments in OIF/OEF. This is not the mission of these detachments, nor are they capable of providing this support. Preventive medicine detachments are small organizations with extremely limited stockpiles of supplies. The correct channel for ordering supplies is through the normal supply system.

Recommendation: Units need to deploy with completely stocked field sanitation kits. Once in theater, proactive ordering of replacement supplies is a must if the team is to remain effective. Do not expect the two-man preventive medicine detachment to resupply you after an inspection.

Issue: Unit field sanitation teams

Discussion: The preventive medicine section conducts monthly field sanitation team training for the division. As a result, the division does not have a shortfall of unit field sanitation teams. However, most units have only one team and many of these Soldiers did not deploy with their units for OIF. Also, unit field sanitation team equipment is a habitual shortfall identified during command inspections. Typically, the shortages are identified in preparation for the unit's inspection; however, because of competing demands for limited funding, most units do not order the field sanitation equipment and supply shortages that are not part of the usual field sanitation equipment set, including material to construct burn-out or pit latrines and hand-washing stations.

Recommendations:

- Units should maintain an adequate number of deployable Soldiers trained in field sanitation to ensure a team is always available for deployments.
- The division leadership should conduct follow-up inspections to ensure shortages of field sanitation equipment and supplies are on-hand in the unit at all times, not just for deployments.
- Field sanitation should be incorporated into all field training events.
- During deployments field sanitation personnel and equipment should deploy with the unit.
- Added equipment such as material for burn-out or pit latrines and hand-washing stations must be taken on deployments to areas without pre-existing toilet facilities. At least some of these latrines should be available to accompany the first Soldiers to arrive at a site.

Issue: Field sanitation supplies

Discussion: We were able to plus up on field sanitation to fill our set to above 100%. The problem we faced was that cargo space on vehicles was at a premium. With all the extra Class

VIII; petroleum, oils, and lubricants (POL); and Class IX extras, the field sanitation items took a lower precedence. To mitigate this, the field sanitation team took one-gallon sized zip lock bags and created individual Soldier field sanitation packs. They included insect repellent in both spray and lotion form, Chapstick, sun screen, water purification tabs, and three packages of insect repellent treatment (the dip variety) for BDU/DCUs. The individual packets freed a lot of space in the field sanitation kit and dispersed it to each Soldier. This was especially beneficial for the forward deployed Soldiers. Additionally, it gave each Soldier instant access to field sanitation items he would need as the deployment wore on.

Recommendation: The individual Soldier field sanitation packs seemed to have many more advantages than drawbacks. In fact the only drawback would be not enough items to go around. If that is the situation, it would be better to leave items in the field sanitation kit and distribute as needed.

Issue: Units continue to improperly implement field sanitation measures.

Discussion: Units deployed to Iraq without adequate field sanitation equipment. Soldiers who are designated as the unit field sanitation team members are usually unit supply personnel who are separated from the unit and unable to implement field sanitation measures. Units implemented field sanitation measures in Kuwait but have failed to continue the same measures in Iraq.

Recommendations: Unit field sanitation teams must order and maintain the equipment required in unit field sanitation kits. Unit field sanitation teams should consist of Soldiers and noncommissioned officers (NCOs) who will be with the unit and therefore able to notice field sanitation issues and implement proper field sanitation measures within the commands.

Issue: Field sanitation in base camps

Discussion: Too many units are content to live with the status quo of their areas until something forces them to react. Field sanitation teams, despite the great efforts of our division preventive medicine section to train to the commanding general's standard in the months leading up to deployment, did not perform their mission. Often field sanitation issues did not receive adequate leader emphasis and units failed to stock/restock their team's kits. Personnel turnover and failing to identify/train replacement members were issues throughout the deployment. Leaders need to take more interest in their programs to ensure DNBI rates maintain manageable. Field sanitation requires constant emphasis and inspection to perform effectively.

Recommendation: Leaders need to place more emphasis on the field sanitation program and hold personnel accountable. Inspection, implementation, and supervision are continuous processes. Units must identify new personnel and ensure they are trained before a team turns over, not after.

(Note: A new field sanitation course has been placed online and can accessed at:
<http://www.cs.amedd.army.mil/dphs/EQB%20Website/fstcc.htm>.)

Chapter 3: Leaders Guide (Company/Battalion Level)

The final principle of preventive medicine measures (PMM) is supervising and enforcing individual and collective PMM at all levels. Poor field sanitation results from a lack of discipline and training, both leader responsibilities.

INDIVIDUAL PREVENTION

Leaders must be fully versed in the requirements of individual prevention outlined in Chapter 1. They must enforce the standards and lead by example by following those measures themselves, regardless of the situation.

COLLECTIVE PREVENTION

Leaders must plan for and supervise the collective prevention for their unit as outlined in Chapter 2. The unit field sanitation team must be regularly trained and their equipment must be frequently inspected by the chain of command. Resourcing this team will pay huge dividends in the quality of life Soldiers enjoy while deployed. A trained, equipped, and resourced unit field sanitation team is a huge combat multiplier for a commander.

LEADERSHIP AND PMM

This last chapter includes a series of checklists, assessment forms, and guides to help leaders to properly train, protect, and employ their Soldiers on the battlefield. As a leader, preventive medicine and field sanitation are the two most important ways you can take care of your Soldiers. By promoting preventive medicine and field sanitation, you not only preserve your combat power for the next day's patrol, convoy, or operation, you also protect the long term health of your Soldiers so you can redeploy them home safely to their families.

SECTION A: UNIT FOOD SERVICE PREVENTIVE MEDICINE CHECKLIST

Personnel factors that contribute to food-borne disease outbreaks are many and varied but can be grouped into two areas: practices related to personal health and practices related to work and food handling.

PRACTICES RELATED TO PERSONAL HEALTH

The supervisor must be concerned about the personal health of food service personnel everyday. At the start of each work shift, workers should be inspected by the supervisor and questioned about their health. Workers with infected cuts, burns, sores, or diarrhea cannot be allowed to handle food. Workers coughing or sneezing or showing symptoms of a severe cold should be used where they will not contaminate food or equipment. The supervisor must be able to determine if the worker should be assigned a non-food-handling job. When in doubt, the worker should be referred to the medical facility for evaluation.

PRACTICES RELATED TO WORK AND FOOD HANDLING.

- Health cards (food handler certificates) for food service workers may be required by the local medical authority. Health cards do not mean that workers are disease-free. It is possible to have a health examination one day and be sick the next day. In some parts of the world, health cards for workers will be emphasized more than in the U.S.
- The supervisor's inspection at the start of the work shift is a must for disease prevention and should look for the following:

- Infected cuts, sores, burns
- Unclean hands (have workers wash hands)
- Diarrhea (known or suspected, must ask workers)
- Signs of respiratory illness (coughing, sneezing)
- Excessive jewelry that could be a safety problem or that allows food particles to accumulate (some rings may interfere with good hand washing)
- Food service workers should not smoke in food preparation areas. Saliva, with its disease organisms, contaminates the smoker's hands, the tobacco product/pipe, and any work surface that the tobacco product touches. Hands should be washed after smoking and before returning to work.

Unclean hands

The most common type of food contamination is from unclean hands. A person's hands are continuously touching or coming into contact with contaminated articles. Hands must be washed often with warm water and soap to keep them clean; fingernails should be closely trimmed and clean. At a minimum, personnel should wash their hands:

- Before beginning work
- After each visit to the toilet
- After handling soiled or contaminated equipment or utensils
- After smoking
- Before preparing food
- After preparing one food item, but before preparing another one
- After handling garbage or other refuse

Hand washing facilities

To encourage frequent hand washing before and during the preparation and serving of food, there should be sufficient and convenient hand-washing sinks in the kitchen and work areas, as well as in or immediately adjacent to the restrooms. Sinks for washing dishes or for the preparation of vegetables are not hand-washing sinks and should not be used as such. Organisms washed off the hands can contaminate the sink and then contaminate the vegetables, utensils, or equipment cleaned in the sinks. Only single-service paper towels or approved continuous roll towels should be used for hand drying. Soap and clean towels must always be available. If workers do not wash their hands frequently, they are contaminating the food with disease organisms.

Food handling techniques

Food service workers should avoid unnecessary hand contact with food. Whenever possible, food should be handled with clean utensils, such as tongs, scoops, spoons, or forks. Frequently, food service workers unnecessarily use their hands to serve food such as butter slices, ice cubes,

and bread. Single-service plastic gloves should be used when it is necessary to handle food extensively, as in the preparation of meatloaf.

The following sanitary work habits must be standards for food service personnel:

- Pick up silverware, cups, glasses, and plates by the handle, the bottom, or the edge.
- Take great care in bussing tables and in handling soiled napkins, glasses, cups, silverware, and other utensils that may carry disease organisms from the consumer. Personnel who carelessly handle these soiled articles can pick up microorganisms on their hands and transfer them to their own mouths or to other consumers by re-contaminating clean utensils and equipment or to food that will be served to the consumer. For their own protection and for the consumer's protection, personnel must be trained to handle dirty utensils and equipment in the same careful way that clean utensils must be handled or wear gloves.

Factors that most often cause food-borne disease outbreaks

Although the supervisor does not have to memorize every sanitary standard and regulation, he must use common sense. He must be aware of factors that contribute to food-borne disease outbreaks in both garrison and field operations. The only way to control these factors is through proper supervisory actions. The following five factors most often cause food-borne disease outbreaks:

- Failure to refrigerate potentially hazardous foods properly and maintain cold food at a product temperature at 45°F or below
- Failure to maintain potentially hazardous hot foods at a product temperature of 140°F or above
- Failure to cook potentially hazardous foods thoroughly
- Failure to protect foods from cross-contamination
- Failure to use proper storage practices

Obtaining safe, wholesome food supplies in combat areas can be a special problem faced by Army cooks. Inspected food supplies may not always be available. In the event foods must be procured locally, they may be heavily contaminated. In areas where human excreta is used as a fertilizer or where gastrointestinal and parasitic diseases are known to exist, raw fruits and vegetables must be approved for use by the medical authority. When approved for use, the medical authority will establish special handling requirements. A method of preparing these products is to wash them in potable water and then thoroughly disinfect them by one of the following methods:

- Immerse them in 160°F water for 1 min.
- Immerse them in a solution of Disinfectant, Food Service, for 30 min.
- Immerse them for 30 min in a 200 parts per million (ppm) chlorine solution.

SECTION B: UNIT FIELD SANITATION TEAM CHECKLIST

As a commander, you need to make your field sanitation team an asset you can use. It can assist you in carrying out all field sanitation tasks for protecting the health of your unit. This invaluable team is responsible for those PMM that affect your unit as a whole or are beyond the resources of the individual Soldier. A unit's effectiveness depends on its members' health. Military units are unable to carry out their missions when unit personnel are weakened by disease. The success or failure of an army, the outcome of a war, and the fate of a nation may, therefore, rest on how well diseases and non-battle injuries are prevented through effective PMM in the units. The field sanitation team plays a major role in reducing diseases and non-battle injuries. When you encounter problems beyond the capabilities of the field sanitation team, you should request assistance from supporting preventive medicine elements. Your unit medical personnel should also be able to provide you with assistance.

Field Sanitation Team Checklist

INSPECTION ITEM	YES	NO
1. Have one NCO and one specialist or below been appointed as unit field sanitation team members? (AR 40-5, para 14-3)		
2. Are unit field sanitation team personnel school trained and on orders? (AR 40-5, para 14-3)		
3. Are the required references on hand? (AR 40-5, FM 21-10, FM 21-10-1, TB MED 81, TB MED 507, AND TB MED 530)		
4. Are the required field sanitation team supplies on hand? Are they on an active supply requisition? (AR 40-5, para 14-3)		
5. Are all on-hand supplies and equipment serviceable? (AR 40-5, para 14-3)		
6. Are all supplies and equipment protected and secured? (AR 40-5, para 14-3)		
7. Are pesticides stored in accordance with applicable laws? DoD 4150.7-M		
8. Is pesticide usage monitored and recorded on DD form 1532-1? (DoD 4150.7-M)		
9. Are copies of DD form 1532-1 being sent to USACHPPM, ATTN: MCHB-TS-OEN (Pesticide Hotline), APG, MD 21010? (DoD 4150.7-M)		
10. Are 6 oz jars of calcium hypochlorite stored separately from organic materials in individually packed plastic zip lock bags and placed in serviceable ammunition cans? (DoD memorandum)		
11. Is ammunition can used to store 6 oz jar of calcium hypochlorite marked as "oxider"? (DoD memorandum)		
12. Does unit have current field sanitation team SOP and did the commander sign? (AR 40-5, para 14-3)		
13. Are water trailers and other water containers cleaned and maintained in serviceable condition? (See inspection form.) (AR 40-5, para 14-3)		
14. Are preventive medicine water trailer inspection reports on hand? (TB MED 577)		
15. Do field sanitation team members perform routine inspections of unit water trailers and water cans?		
16. Are water containers inspected 72 hours prior to any deployment and after re-deployment? (AR40-5, para 14-3)		
17. Do members of the field sanitation team conduct unit training on heat and cold injuries and other individual PMM? (AR 40-5, para 14-3)		
18. Are personal protective equipment/clothing stored properly? (AR 40-5, para 14-3)		
19. Are material safety data sheets (MSDS) on hand? (AR 40-5, para 14-3)		

FIELD SANITATION IN CONTINGENCY OPERATIONS

Field Sanitation Team Inspection Checklist

Unit _____ Location _____ Date _____ Rating _____ Inspector _____

REQUIREMENT	GO/NO-GO	STATUS (G/R/A/B)	CERTIFICATION	INFORMATION
Authorized strength			Alpha roster/MTOE	
Water trailer			See water trailer inspection form	

ITEM	NSN	UI	REQUIRED	ON HAND
Insect repellent, personal application (2 oz tube)+	6840-01-284-3928	BX	2 tubes/Soldier	
Insect repellent, clothing IDA kit+	6840-01-345-0237	BX	3 kits/Soldier	
Insect repellent, clothing and bed net treatment+	6840-01-278-1336	BX	1 can/Soldier	
Insecticide, d-phenothrin+	6840-01-412-4634	CN	1 can/Soldier	
Insecticide, chlorpyrifos (Dursban LO) + or Insecticide, Demand Pestab+	6840-01-210-3392 or 6840-01-431-3357	BX CO	1/150 Soldier	
Fly bait	6840-01-183-7244	CN	1/150 Soldier	
Rodenticidal bait anticoagulant (0.005% diphacinone) +	6840-00-089-4664	BX	1 BX/150 Soldier	
Sprayer, insecticide manually carried (2 gal) or Sprayer, insecticide manually carried (1 gal)	3740-00-641-4719 or 3740-00-191-3677	EA	1/50 Soldiers	
Sprayer, insecticide repair parts kit	3740-01-234-3448	EA	3/Sprayer	
Trap glue, rodent	3740-01-240-6170	BX	2 BX/150 Soldiers	
Trap glue, roach	3740-01-096-1632	BX	2 BX/150 Soldiers	
Swatter, fly	3740-00-252-3383	DZ	1 dz/150 Soldiers	
Goggles, industrial (non-vented)	4340-00-190-6432	EA	2/150 Soldiers	
Gloves, chemical and oil protective	8415-01-012-9294	PR	2/150 Soldiers	
Respirator, pesticide	4240-01-259-4578	EA	3/team	
Coveralls, cotton sateen	8405-00-082-5533	EA	6/150 Soldiers	
Calcium hypochlorite (6 oz jar)+	6810-00-255-0471	BT	1/150 Soldiers	
Chlorination kit, water purification + or Chlorination kit, water	6850-00-270-6225 or 6850-01-374-9921	KT	1/15 Soldiers	
Water purification tablet, iodine	6850-00-985-7166	BT	2/Soldiers	
Thermometer, food	6685-00-444-6500	EA	2/team	
Wet bulb-globe temperature kit (WBGT)	6665-00-159-2218	EA	1/unit	
Wet bulb-globe temperature, black globe thermometer	6685-01-110-4429	EA	1/unit	

CENTER FOR ARMY LESSONS LEARNED

Wet bulb-globe temperature, wet bulb thermometer	6685-01-110-4430	EA	1/unit	
Wet bulb-globe temperature, dry bulb thermometer	6685-01-110-6563	EA	1/unit	
Alcohol swabs, single pads (500)	6510-01-153-4638	BX	1 BX/150 Soldiers	
Chest #3, 30 x 18 x 10	6810-00-914-3480	EA	As required to store supplies	

* 1-Small, 1-Medium, 1-Large + Hazardous material; require MSDS ** Do not store with pesticides. Spontaneous combustion can occur.

Remarks:

**Unit Representative
Name:**

Signature:

Field Sanitation Additional Equipment Listing

ITEM	NSN	UI	Allowance
Alcohol swabs, single pads 500s	6510-01-153-4638	BX	1/150 indv
Calcium hypochlorite 6 oz jar (See Note 1)	6810-00-255-0471	BT	1/50 indv
Chest, #3, 30x18x10 aluminum (See Note 2)	6545-00-914-3480	EA	As required to move stored items
Chlorination kit, water purification or Chlorination kit, water	6850-00-270-6225 or 6850-01-374-9921	KT	1/15 indv
Chlorine test tablets DPD #1 (100 tablets)	6550-01-044-0315	PG	1
Container, bait, rodent (UI contains 6 bait stations)	3740-01-423-0737	BX	1/team
Disinfectant, food service (U/I contains 12 packets)	6840-00-810-6396	BX	1/75 indv
Gloves, chemical and oil protective (size 9) or Gloves, chemical and oil protective (size 11)	8415-01-012-9294 or 8415-01-013-7384	PR	2/150 indv
Goggles, industrial non-vented	4240-00-190-6432	EA	2/150 indv
Insect repellent, personal application, 2 oz tube (UI contains 12 tubes)	6840-01-284-3982	BX	4 tubes/indv
Insect repellent, clothing application IDA Kit (UI contains 12 kits)	6840-01-345-0237	BX	4 kits/indv
Insect repellent, clothing & bed net treatment, aerosol, 6 oz can (UI contains 12 cans)	6840-01-278-1336	BX	1 can/indv
Insecticide, chlorpyrifos 42%, unit dose 40 ml btl (Dursban LO) (UI contains 12 btl) or Insecticide, Demand Pestab 10% tablets, unit dose (UI) contains 40 tablets) (See Note 3)	6840-01-210-3392 or 6840-01-431-3357	BX CO	1/150 indv
Insecticide, d-phenothrin 2%, aerosol, 12 oz	6840-01-412-4634	CN	1/indv
Mouse trap, spring indv (UI contains 12 traps)	3740-00-252-3384	DZ	4dz/150 indv
Rat trap, spring (UI contains 12 traps)	3740-00-260-1398	DZ	4dz/150 indv
Rodenticidal bait anticoagulant, 0.005% diphacinone 40 blocks per box	6840-00-089-4664	BX	1/150 indv
Rodenticide bait anticoagulant, 0.005% brodifacoum (Talon-G) 11 lb can or Rodenticidal bait anticoagulant, 0.005% bromadiolone, (Maki pellets) 11 lb can (See Note 4)	6840-01-426-4808 or 6840-01-151-4884	CN	1/150 indv
Sprayer, insecticide, manually carried, 2-gal or Sprayer, insecticide, manually carried, 1-gal (See Notes 5 & 6)	3740-00-641-4719 or 3740-00-191-3677	EA	1/150 indv
Swatter, fly (UI contains 12 fly swatters)	3740-00-252-3383	DZ	1/150 indv
Test paper, chlorine residual (UI is package of 10)	6630-01-012-4093	PG	1
Thermometer, food	6685-00-444-6500	EA	2

CENTER FOR ARMY LESSONS LEARNED

Water purification tablet, chlorine (UI contains 10 tablets) or Water purification tab 50s, iodine, 8 mg (UI contains 50 tablets)	6850-01-352-6129 or 6850-00-985-7166	PG BT	10/indv 2/indv
Wet bulb-globe temperature (WBGT) kit (without tripod) (See Note 7) or Wet bulb-globe temperature (WBGT) kit (with tripod) (See Note 7)	6665-00-159-2218 or 6665-01-381-3023	EA	1/unit
Wet bulb-globe temperature (WBGT) black globe thermometer (replacement part)	6685-01-110-4429	EA	1
Wet bulb-globe temperature (WBGT) wet bulb thermometer (replacement part)	6685-01-110-4430	EA	1
Wet bulb-globe temperature (WBGT) dry bulb thermometer (replacement part)	6685-01-110-6563	EA	1
Wet bulb-globe temperature (WBGT) wick (replacement part) (See Note 7 & 8)		EA	1
Wet bulb-globe temperature (WBGT) calculator wet bulb (moveable scales)	6665-01-109-3246	EA	As needed

Note 1: Store calcium hypochlorite separately from organic materials in individually packed plastic zip lock bags. Place individually packed zip lock bags into a serviceable ammunition can marked with Department of Transportation (DOT) oxidizer labels.

Note 2: Units may store field sanitation materials (except NSN 6810-00-255-0471, calcium hypochlorite, unless packed in a serviceable ammunition can) in a sealed metal chest or in a footlocker. Whenever possible, keep all materials in their original packaging. If removed from the original package, package the materials in a fiberboard or plywood box and then place them into the sealed metal chest or footlocker.

Note 3: Demand Pestab replaces insecticide, chlorpyrifos (Dursban LO, NSN 6840-01-210-3392). Use Dursban LO until stocks depleted.

Note 4: Do not prestock Talon-G or Maki because of short shelf-life. Order on a priority basis prior to anticipated deployment. For emergency procurement: Contact the Defense Supply Center, Richmond (DGSCR) Emergency Supply Operations Center (ESOC) at DSN 695-4865 or Commercial (804) 279-4865. This ESOC is staffed 24 hours a day, 7 days a week.

Note 5: Obtain three sets of repair parts for each sprayer. Repair parts include items such as: check valves, pressure cups, filters, O-rings, and four way nozzles with crack and crevice tips. Order repair parts from the sprayer manufacturer by part number as Class IX repair parts.

Note 6: If all sprayers are not equipped with a pressure gauge, order a pressure gauge, NSN 3740-01-332-8746, and filter, NSN 4330-01-332-1639, to retrofit the sprayers.

Note 7: WGBT kit replacement wick (Part Number 5180-0001), water reservoir (Part Number 6013-0145), and black globe analog (round piece that fits over black thermometer) (Part Number 6013-0142) can be purchased from Sigma Products, South Carolina, 1-800-215-0440 (Ms. Cramer). NSN assignment and Armed Forces Management Board review pending.

Note 8: Cotton shoestring may be used for wick replacement.

**SECTION C: FIELD SANITATION/PREVENTIVE MEDICINE BASE CAMP
ASSESSMENT FORM**

1. Standing water (SW)/mosquito control

No untreated standing water within 400 m of troop living and working areas.

GREEN Meets standard	AMBER SW present/few mosquitoes	RED Untreated SW/mosquito swarms/troop complaints

2. Tall grass/tick control

No untreated grass taller than 6" within 3 m of tents, pathways, fighting positions. No troops affected by ticks.

GREEN Meets standard	AMBER Exceeds standard/less than 1% troops affected by ticks	RED Exceeds standard/greater than 1% troops affected/preventive medicine surveys + ticks

3. Rodents/rodent habitat

No piles of trash or rubbish within 200 m of logistics support area (LSA)

GREEN Meets standard	AMBER Rubbish piles inside camp/no rodents sighted or trapped	RED Rubbish piles inside camp/ rodents sighted/trapped

CENTER FOR ARMY LESSONS LEARNED

4. Stray animals

No pets/mascots, stray animals chased from area or eliminated

GREEN Meets standard	AMBER Stray in area for less than 24 hrs	RED Stray in area for more than 24 hrs

5. Waste disposal

All garbage placed in plastic bags and deposited in serviceable dumpsters with lids

GREEN Meets standard	AMBER Dumpsters overfilled/bags on ground	RED Overfilled/food debris on ground/flies/odor

6. DOD Insect Repellent System

GREEN Meets standard	AMBER 80-90% Soldiers comply	RED less than 79% comply

7. Water supply

Non-bottled water supply approved by preventive medicine; chlorinated to 1 ppm free available chlorine (FAC), coliform free

GREEN Meets standard	AMBER 0 FAC and/or total coliform +	RED Fecal coliform +

8. Food service sanitation

Food service operations comply with TB MED 530

GREEN Satisfactory rating	AMBER Marginal rating	RED Unsatisfactory rating

9. Troop living/sleeping areas

Each Soldier has min 55 sq ft of living space to reduce transmission of respiratory disease.

GREEN Meets standard	AMBER 40-55 sq ft/Soldier	RED less than 40 sq ft/Soldier

10. Waste water disposal

All water containing human waste collected in holding tanks prior to final disposal. Waste water from showers discharged to soakage pits or outside camp perimeter.

GREEN Meets standard	AMBER Gray water discharged on ground inside camp	RED Amber and/or any direct discharge of sewage

11. Noise control

Soldiers not exposed to noise levels in excess of 85 decibels (acoustic) (dBA) on routine basis or in living areas.

GREEN Meets standard	AMBER Exposed to greater than 85 dBA but use hearing protection	RED Exposed to greater than 85 dBA/no hearing protection

CENTER FOR ARMY LESSONS LEARNED

12. Field sanitation teams

Two trained Soldiers per Co/Trp/Btry.

GREEN 90% units meet standard 90% equipment on hand (EOH)	AMBER 70-89% meet standard 80-90 % EOH	RED Less than 69% meet standard Less than 79% EOH

13. Field sanitation team equipment

Base camp has all field sanitation equipment on hand for use by team personnel.

GREEN 90%+ of units have equipment on hand . Able to perform mission.	AMBER 80-89% of units have equipment on hand. Able to perform mission.	RED Less than 79% of units have equipment on hand. Unable to perform mission

Overall rating solution:

Rating

RED:	2 or more severe areas noted
AMBER:	1 severe and no moderate areas noted more than 2 moderate areas noted
GREEN:	No severe and less than 2 moderate areas noted

REMARKS: _____

BASE CAMP REPRESENTATIVE: _____

PREVENTIVE MEDICINE REPRESENTATIVE: _____

Standards For Base Camp Assessment (BCAT) Forms

CRITERIA	STANDARD	ASSESSMENT
1. Standing water/ mosquito control	No untreated water within 400 m of troop living and work areas	Green= Camp meets standard Amber= Standing water present, few mosquitoes present Red= Untreated standing water present, swarms of mosquitoes, troop complaints
2. Tall grass/ tick control	No untreated grass/shrubbery taller than 6" within 3 m of tents, camp pathways, fighting positions, no troop affected by ticks	Green= Camp meets standard Amber= Grass and shrubs exceed standard, less than 1% of troops affected by ticks/month Red= Grass and shrubbery exceeds standard, greater than 1% of troops affected by ticks/month, preventive medicine survey shows ticks present
3. Rodents/ rodent habitat	No piles of trash or rubbish within 200 m of logistics supply area (LSA)	Green= Camp meets standard Amber= Rubbish piles inside camp, no rats or mice sighted by Soldiers or trapped by field sanitation or preventive medicine survey team Red= Rubbish piles inside camp, rats or mice observed/trapped in LSA
4. Stray animals	No pets/mascots, stray animals chased from area or eliminated	Green= Camp meets standard Amber= Stray animal(s) remain in area for less than 24 hrs and depart Red= Stray animal(s) remain in area for greater than 24 hrs and are not shy
5. Waste disposal	All garbage placed in plastic bags and deposited in serviceable dumpsters with lids	Green= Camp meets standard Amber= Dumpster(s) overfilled with garbage, garbage bags placed on ground around dumpster Red= Dumpster overfilled, food debris spilled on ground around dumpsters, flies present, odor
6. DoD Repellent System	90% Soldiers have at least one tube of DEET insect repellent and have treated 3 sets of BDUs with permethrin	Green= Camp meets standard Amber= 80-89% of Soldiers comply with standard Red= less than 79% of Soldiers comply with standard
7. Water supply	Non-bottled water supply is approved by preventive medicine, chlorinated to 1.0 ppm and coliform free	Green= Camp meets standard Amber= No chlorine residual and/or total coliform positive, must be fecal coliform negative Red= Fecal coliform positive regardless of chlorine residual in water
8. Food service sanitation	Food service operations comply with provisions of TB MED 530 as determined by preventive medicine	Green= Camp meets standard Amber= Marginal rating on last inspection Red= Unsatisfactory rating on last inspection, re-inspect within 72 hours
9. Troop living/ sleeping areas	Each Soldier has at least 55 sq ft of living space to prevent the spread of respiratory disease	Green= Camp meets standard Amber= 40-55 sq ft living space/Soldier Red= Less than 40 sq ft of living space/Soldier

CENTER FOR ARMY LESSONS LEARNED

10. Waste water disposal	All water containing human waste collected in holding tanks prior to final disposal, wastewater from showers discharged to soakage pits or outside camp perimeter.	Green= Camp meets standard Amber= Grey water discharged directly on ground inside perimeter Red= Grey water discharged on the ground without use of soakage pits, any direct discharge of sewage on the ground
11. Noise control	Soldiers are not exposed to noise levels in excess of 85 dBA on a routine basis or while in living areas	Green= Camp meets standard Amber= Soldiers routinely exposed to noise levels greater than 85 dBA, but use proper hearing protection Red= Soldiers routinely exposed to noise levels greater than 85 dBA, no hearing protection used or available
12. Field sanitation teams	Two trained Soldiers per Co/Trp/Btry, one must be a NCO	Green= 90%+ of units at camp meets standard Amber=70-89% of units at camp meets standard Red= Less than 69% of units at camp meets standard
13. Field sanitation team equipment	Base camp has all field sanitation equipment on hand for use by team personnel (Note: Field sanitation equipment checklist can be obtained from preventive medicine team, but unit field sanitation teams should have checklist on hand.)	Green= 90%+ of units have equipment on hand Amber= 80-89% of units have equipment on hand Red=Less than 79% of units have equipment on hand

SECTION D: UNIT OPERATIONS IN HOT WEATHER CLIMATE**HOT WEATHER INJURIES**

High temperatures, overexposure to the sun, inadequate water consumption, and overexertion may result in one or more of the following:

Dehydration

The human body is highly dependent on water to cool itself in a hot environment. A safe and adequate supply of water must be available at all times to every Soldier. **SOLDIERS MUST ONLY DRINK WATER FROM APPROVED SOURCES.** Fresh water may be contaminated by minerals through which the water flows or contain bacteria or parasites that may cause disease and non-battle injury (DNBI).

Countermeasures:

- Ensure all Soldiers drink adequate quantities of (preferably cool) water.
- Drink water regularly, even when not thirsty. Thirst is not an accurate indication of the body's need for water. Drink about one quart each hour (or more depending on extreme conditions and workload) or enough to maintain urine the color of weak lemonade (dark urine indicates the body's need for water).
- Ensure water supplies have been processed by reverse osmosis water purification units (ROWPU) and properly chlorinated to 2.0 parts per million (ppm). The chlorine residual for ROWPU treated water must be maintained at 1.0 ppm in the unit area unless otherwise designated by the medical authority.
- If non-approved fresh water (from lakes, rivers, streams) must be used IN A LIFE OR DEATH SITUATION, disinfect the water using one of the following methods:
 - Calcium hypochlorite at 5.0 ppm for 30 minutes
 - Chlor-Floc or iodine tablets per label instructions
 - Boil water at a rolling boil for 5-10 minutes
 - Add two to four drops of ordinary chlorine bleach per quart of water and wait 30 minutes
- Avoid storing bottled water in direct sunlight (due to possible bacterial growth).
- Soldiers in armored vehicles, mission-oriented protective posture (MOPP), and body armor need to increase water intake.
- Monitor local weather conditions closely, especially the rapidly changing wet bulb temperature (WBGT).

Sunburn

Sunburn is caused by overexposure of the skin to ultraviolet (UV) radiation of the sun. Sand, rocks, and other desert surfaces reflect sunlight from the ground and may result in sunburn to the nostrils or chin. Severe sunburns are disabling and may make Soldiers more susceptible to other types of heat injuries.

Countermeasures:

- Use unscented sun block for skin (applying to all exposed face, skin, and neck). Lip balm with SPF 15 or higher and sunglasses will protect Soldier's lips and eyes from UV radiation.
- Wear uniforms properly.
- While on guard duty, avoid standing in direct sunlight; regularly rotate Soldiers with duties requiring exposure to extreme temperatures for long periods (guard mount; petroleum, oils, and lubricants (POL) point; observation posts; and maintenance personnel).

Heat cramps

Heat cramps are characterized by painful cramps of the muscles, usually the legs and abdomen, caused by an imbalance of electrolytes in the body as a result of excessive sweating. Soldiers suffering from heat cramps may complain of muscle cramps, heavy sweating, and extreme thirst.

Countermeasures:

- Seek immediate medical attention for all heat injuries.
- Move the Soldier to a cool, shady area or air conditioned building or vehicle and loosen clothing. (**Note:** When in a chemical environment, DO NOT loosen/remove clothing.)
- Slowly give large amounts of water (cool water if available).
- Watch the Soldier; continue to provide water if the Soldier accepts it.

Heat exhaustion

Heat exhaustion is a preventable condition caused by the loss of water through sweating without adequate fluid replacement. Soldiers suffering from heat exhaustion may experience heavy sweating with pale, moist, cool skin; headache; weakness; dizziness; and/or loss of appetite.

Countermeasures:

- Seek immediate medical attention for all heat injuries.
- Move the Soldier to a cool, shady area or air conditioned vehicle or building and loosen clothing. (**Note:** When in a chemical environment, DO NOT loosen/remove clothing.)

- Pour water on the Soldier and fan to permit cooling effect; if available apply ice or ice packs.
- Have the Soldier slowly drink at least one full canteen of water.
- Elevate Soldier's legs.
- If possible, Soldier should not participate in strenuous activity for the remainder of the day.

Heat stroke

Heatstroke is a MEDICAL EMERGENCY that may result in death if treatment is delayed. Soldiers suffering from heatstroke should be evacuated immediately to a medical facility. Soldiers who have worked in a very hot, humid environment for a prolonged time and have not consumed an adequate amount of water are susceptible to heatstroke that is caused by failure of the body's cooling systems. Soldiers suffering from heatstroke may experience sweating (**Note:** Sweating does not indicate a less serious heat injury; Soldiers with heat stroke sometimes do sweat); flushed, red, hot, dry skin; weakness; dizziness; confusion; headaches; seizures; nausea; rapid respiration; and weak pulse. Irritable, combative, or irrational behavior sometimes precedes heatstroke. Unconsciousness and collapse may occur suddenly.

Countermeasures:

- Move the Soldier to a shady area or air conditioned vehicle or building and loosen clothing (remove outer and/or protective clothing if the situation permits). (**Note:** When in a chemical environment, DO NOT loosen/remove clothing.)
- Start cooling the Soldier IMMEDIATELY; immerse in cool water (or pour water on the Soldier).
- Fan to cool.
- Massage extremities and skin to increase blood flow to body areas (aiding the cooling processes).
- Elevate Soldier's legs.
- If conscious, have the Soldier slowly drink one full canteen of water.
- Monitor Soldier for development of conditions that may require performance of necessary basic lifesaving measures such as clearing the airway, mouth-to-mouth resuscitation, and/or treatment for shock.
- Evacuate as soon as possible to a medical facility continuing emergency procedures during transport.

SALT REPLACEMENT

In addition to water, the body's supply of sodium chloride (or salt) is also lost in sweat. Salt lost through sweat should be replaced only by consuming prescribed amounts of rations. Soldiers should NOT take salt tablets or consume additional salt with meals, unless strictly controlled by

medical personnel. Field rations usually contain very high salt concentrations; therefore, Soldiers should maintain a higher water intake when consuming these meals. Excess intake of salt should be avoided as it may cause increased thirst and/or nausea.

ACCLIMATIZATION

Acclimatization to heat is necessary to permit the body to reach and maintain maximum efficiency in its cooling process. Ideally, a period of about two weeks should be allowed for acclimatization, with progressive degrees of heat exposure and physical exertion. Soldiers and unit leaders should note that although acclimatization strengthens heat resistance, there is no such thing as total protection against the effect of heat. The table below presents guidelines for unit leaders, medical planners, and Soldiers to follow. Pre-acclimatization may be achieved by gradually increasing physical activity in a hot environment.

Unit leaders, commanders, and Soldiers should note these very basic guidelines for preventing heat injuries:

- Consider water a tactical weapon.
- Drink water frequently, even if not thirsty. Drinking should be required and monitored by command.
- Use unscented sun screen and lip balm (SPF 15 or higher) and sunglasses.
- Place something between Soldiers and the hot ground.
- Limit movements.
- Wear uniform properly: Wear T-shirt; roll sleeves down; cover head; and protect the neck with a scarf or similar item to protect the body from hot, blowing winds and sunlight.
- Resting in the shade, quietly, fully clothed, not talking, keeping mouth closed, and breathing through the nose will decrease the body's water requirement.
- Perform heavy work in the cooler hours of the day, such as early morning or late evening, if possible. If working or traveling during these periods, watch for increased activity of wildlife (snakes and insects).
- Identify Soldiers with previous heat injuries.
- If in an emergency situation and water is scarce, do not eat. Find water by looking for animal trails that may lead to water holes, flocks of circling birds, or look (or dig) for water in areas supporting plants or grasses. Disinfect water as stated previously.

FLUID REPLACEMENT GUIDELINES FOR WARM WEATHER TRAINING
(Applies to average acclimated Soldier wearing BDU, hot weather)

Heat Category	*WBGT Index "F"	Easy Work	Moderate Work	Hard Work			
		Work/Rest	Water Intake (qt./hr.)	Work/Rest	Water Intake (qt./hr.)	Work/Rest	Water Intake (qt./hr.)
1	78 - 81.9	NL	½	NL	¾	40/20 min	¾
2 (Green)	82 - 84.9	NL	½	50/10 min.	¾	30/30 min	1
3 (Yellow)	85 - 87.9	NL	¾	40/20 min	¾	30/30 min	1
4 (Red)	88 - 89.9	NL	¾	30/30 min	¾	20/40 min	1
5 (Black)	greater than 90	50/10 min.	1	20/40 min	1	10/50 min	1

Information courtesy of LTC Mark A. Lovell, MD, MPH, Program Manager Disease and Injury Control, Directorate of Clinical Preventive Medicine, U. S. Army Center for Health Promotion and Preventive Medicine.

- The work/rest times and fluid replacement volumes will sustain performance and hydration for at least 4 hours of work in the specified heat category. Individual water needs will vary $\pm \frac{1}{4}$ qt/hr
- NL = no limit to work time per hour.
- Rest means minimal physical activity (sitting or standing), accomplished in the shade if possible.
- **CAUTION:** Hourly fluid intake should not exceed 1½ qt.
- Daily fluid intake should not exceed 12 qt.
- Wearing body armor adds 5°F to WBGT index.
- Wearing MOPP over garment adds 10°F to WBGT index.

Easy Work	Moderate Work	Hard Work
Walking on hard surfaces at 2.5 mph with less than a 30 lb load	Walking on hard surfaces at 3.5 mph with greater than a 40 lb load	Walking on hard surfaces at 3.5 mph with greater than a 40 lb load
Weapon maintenance	Walking on loose sand at 2.5 mph with no load	Walking on loose sand at 2.5 mph with load
Manual of arms	Calisthenics	
Marksmanship training	Patrolling	
Drill and ceremony	Individual movement techniques, (low crawl, high crawl)	
	Defensive position construction	
	Field assaults	

SECTION E: LEADER'S GUIDE TO COMBAT OPERATIONAL STRESS CONTROL

COMBAT STRESS IN SOLDIERS

Whatever the situation, you will have emotional reactions (conscious or unconscious) toward the Soldier with combat stress or fatigue. Your reactions can either help or hinder your ability to help him. When you are tired or worried, you may very easily become impatient with the person who is unusually slow or who exaggerates. You may even feel resentful toward him. At times when many physically wounded lie about you, it will be especially natural for you to resent disabilities that you cannot see. Physical wounds can be seen and easily accepted. Emotional reactions are more difficult to accept as injuries. On the other hand, you may tend to be overly sympathetic. Your excessive sympathy for an incapacitated person can be as harmful as your negative feelings. He needs your help, not your pity. Pity will make him feel even more inadequate. You must expect the Soldier to recover, to be able to return to duty, and to become a useful Soldier. This expectation should be displayed in your behavior and attitude, as well as in what you say. If he can see your calm confidence and competence, he will be reassured and feel more secure.

You may feel guilty at encouraging this Soldier to recover and return to an extremely dangerous situation, especially if you remain behind in a safer, more comfortable place; however, if he returns to duty and does well, he will feel strong and whole. On the other hand, if he is sent home with psychological problems, he may have self-doubt and often disabling symptoms the rest of his life.

Remember that in combat, someone must fight in this Soldier's place. If this Soldier returns to his unit and comrades, he will be less likely to suffer from combat stress again (or be wounded or killed) than will a new replacement.

As with the physically injured Soldier, the medical personnel will take over the care of the emotionally distressed Soldier. The initial first aid you provide will be of great value to his recovery.

Remember that all Soldiers have a potential emotional overload point which varies from individual to individual, from time to time, and from situation to situation. Because a Soldier has reacted abnormally to stress in the past does not necessarily mean he will react the same way to the next stressful situation. Remember, any Soldier, as tough as he may seem, is capable of showing signs of anxiety and stress. No one is absolutely immune.

Finally, remember that there are significant resources in the Army to help you treat this individual. Your unit chaplain can counsel the Soldier and help you to detect any early onset of COSR. The combat operational stress control team's mission is to help commanders with combat stress and help with the morale of the Soldiers. Medical personnel can assist commanders with identifying unnecessary stressors in a unit and provide combat operational stress control classes to assist Soldiers with coping with excessive stress.

MILD COSR	
PHYSICAL SIGNS*	EMOTIONAL SIGNS *
1. Trembling, tearful 2. Jumpiness, nervousness 3. Cold sweat, dry mouth 4. Pounding heart, dizziness 5. Nausea, vomiting, diarrhea 6. Fatigue 7. "Thousand-yard stare"	1. Anxious, indecisive 2. Irritable, complaining 3. Forgetful, unable to concentrate 4. Insomnia, nightmares 5. Easily startled by noises, movement 6. Grief, tearful 7. Anger, beginning to lose confidence in self and unit 8. Difficulty thinking, speaking, and communicating
SELF AND BUDDY AID	
1. Continue mission performance, focus on immediate mission. 2. Expect Soldier to perform assigned duties. 3. Remain calm at all times; be directive and in control. 4. Let Soldier know his reaction is normal and that there is nothing seriously wrong with him. 5. Keep Soldier informed of the situation, objectives, expectations, and support; control rumors. 6. Build Soldier's confidence; talk about succeeding. 7. Keep Soldier productive (when not resting) through recreational activities and equipment maintenance. 8. Ensure Soldier maintains good personal hygiene. 9. Ensure Soldier eats, drinks, and sleeps as soon as possible. 10. Let Soldier talk about his feelings. DO NOT "put down" his feelings of grief or worry. Give practical advice and put emotions into perspective.	
*Most or all of these signs are present in mild COSR. They can be present in any normal Soldier in combat, yet he can still do his job.	

MORE SERIOUS COSR	
PHYSICAL SIGNS*	EMOTIONAL SIGNS*
1. Constantly moves around 2. Flinching or ducking at sudden sounds and movement 3. Shaking, trembling (whole body or arms) 4. Cannot use part of body, no physical reason (hand, arm, legs) 5. Cannot see, hear, or feel (partial or complete loss) 6. Physical exhaustion, crying 7. Freezing under fire or total immobility 8. Vacant stares, staggers, sways when stands 9. Panic running under fire	1. Rapid and/or inappropriate talking 2. Argumentative, reckless actions 3. Inattentive to personal hygiene 4. Indifferent to danger 5. Memory loss 6. Severe stuttering, mumbling, or cannot speak at all 7. Insomnia, nightmares 8. Seeing or hearing things that do not exist 9. Rapid emotional shifts 10. Social withdrawal 11. Apathetic 12. Hysterical outbursts 13. Frantic or strange behavior
MANAGEMENT PROCEDURES**	
1. If Soldier's behavior endangers the mission, self, or others, do whatever necessary to control Soldier. 2. If Soldier is upset, calmly talk him into cooperating. 3. If concerned about Soldier's reliability: - Unload Soldier's weapon. - Take weapon if seriously concerned. - Physically restrain Soldier only when necessary for safety or transportation. 4. Reassure everyone that the signs are probably just COSR and will quickly improve. 5. If COSR signs continue: - Get Soldier to a safer place. - DO NOT leave Soldier alone, keep someone he knows with him. - Notify senior NCO or officer. - Have Soldier examined by medical personnel. 6. Give Soldier tasks to do when not sleeping, eating, or resting. 7. Assure Soldier he will return to full duty in 24 hours, and return Soldier to normal duties as soon as he is ready.	
*These signs are present in addition to the signs of mild COSR. **Apply these procedures in addition to the self and buddy aid care.	

PREVENTIVE MEASURES TO COMBAT COSR

1. Welcome new members into your team; get to know them quickly. If you are new, be active in making friends.
2. Be physically fit (strength, endurance, and agility).
3. Know and practice life-saving self and buddy aid.
4. Practice rapid relaxation techniques (FM 6-22.5 and FM 22-51).
5. Help each other out when things are tough at home or in the unit.
6. Keep informed; ask your leader questions; ignore rumors.
7. Work together to give everyone food, water, shelter, hygiene, and sanitation.
8. Sleep when mission and safety permit, let everyone get time to sleep.

Sleep only in safe places and by SOP.

If possible, sleep 6 to 9 hours per day.

Try to get at least 4 hours sleep per day.

Get good sleep before going on sustained operations.

Catnap when you can, but allow time to wake up fully.

Catch up on sleep after going without.

SUICIDE PREVENTION

The role of Army leadership in suicide prevention cannot be overemphasized. Strong leadership is the advantage that the military structure affords and is the reason why protective factors can be more effectively promoted and sustained in the military than in civilian settings. Ever since the first military system was devised, a prominent characteristic of an effective leader has been the ability to protect those under his/her command. A good leader does not expose those under his/her command to unnecessary risk. This applies to death by suicide just as it does to other senseless injury or death. It is the Army leadership's responsibility from the top commander down to platoon and squad leaders to promote the safety of all military personnel. The following are techniques leaders can use to enhance personnel safety:

- Promote “buddy care” among all military personnel: “We are our brother’s keepers!”
- Pay attention to warning signs and respond to those who need help. If anyone suspects or knows that a fellow Soldier, family member, or anyone else is troubled, provide or get help for them.
- Be aware that heightened stress, relationship problems, and impending holidays can trigger inappropriate coping behaviors in vulnerable individuals. Pay close attention to the personal needs of your people, and be on the lookout for signs of stress.
- Communicate in your words and actions that it is not only acceptable, but a sign of strength, to recognize life problems and get help to deal with them constructively.
- Support and protect to the fullest extent possible those courageous people who seek help early, before a crisis develops.
- Create a responsive, caring, and responsible environment where individuals are motivated to seek help with personal struggles without fear of being singled out.

- Create and promote opportunities for social interactions that are important in defining a unit's supportive structure. These range from group and battalion/squadron events to private gatherings. Make sure that you foster a social climate in your unit that communicates to everyone: "You belong here."

Why do people kill themselves?

Psychological pain is a basic ingredient of suicide. Psychological pain is the hurt or ache that takes hold in the mind; the pain of excessively felt shame, guilt, fear, anxiety, and loneliness; and the pain of growing old or dying without dignity. To understand suicide, we must understand suffering and psychological pain. People who complete suicide feel driven to it. They feel that suicide is the only option left.

The primary source of severe psychological pain is frustrated psychological needs to succeed, to achieve, to affiliate, to avoid harm, to be loved and appreciated, and to understand what is going on.

When an individual commits suicide, he or she is often trying to blot out psychological pain that comes from defeated or frustrated psychological needs "vital" to that person. For practical purposes, most suicides tend to fall into one of four categories of thwarted psychological needs:

- Lack of control related to the needs for achievement, order, and understanding
- Problems with self-image related to frustrated needs for affiliation
- Problems with key relationships related to grief and loss in life
- Excessive anger, rage, and hostility

Suicide triggers

Certain events have been found to precipitate suicide in vulnerable individuals. These are not causes of suicide but rather events that occur just before a person's attempts or commits suicide. Like straws that break the camel's back, they are stresses that push someone who is already vulnerable to take self-destructive action. These events include but are not limited to the following:

- A bad evaluation for an enlisted Soldier or officer
- The break up of a close relationship
- Drug or alcohol abuse
- Renewal of bonding with family on return from long field training or an isolated tour
- Leaving old friends
- Being alone with concerns about self and family
- Financial stressors
- New military assignments

- Recent interpersonal losses
- Loss of self-esteem/status
- Humiliation
- Rejection (e.g., job, promotion, boy/girlfriend)
- Disciplinary or legal difficulty
- Suicide of a friend or family member
- Discharge from treatment or from service
- Retirement

Suicidal signs

- Feelings:
 - Hopeless: "Things will never get better"; "There's no point in trying"; sees no future
 - Helpless: "There's nothing I can do about it"; "I can't do anything right"
 - Worthless: "Everyone would be better off without me"; "I'm not worth your effort"
 - Guilt, shame, self hatred: "What I did was unforgivable."
 - Pervasive sadness
 - Persistent anxiety
 - Persistent agitation
 - Persistent, uncharacteristic anger, hostility, or irritability
 - Confusion: Can't think straight or make decisions
- Actions:
 - Uncharacteristic aggression
 - Risk taking
 - Obtains weapon
 - Withdraws from friends/activities
 - Becomes accident-prone
 - Unauthorized absences

- Getting into trouble, discipline problems
- Changes:
 - Personality-more withdrawn, low energy, apathetic, or more boisterous, talkative, outgoing
 - Increased use of alcohol/drugs
 - Loss of interest in personal appearance, hygiene, neatness of personal items, space
 - Loss of interest in hobbies, work, sex
 - Marked decrease in work performance
 - Sleep, appetite increase or decrease
- Threats:
 - Talking about suicide directly or indirectly; for example, “How long does it take to bleed to death?”; written themes of death; preoccupation with subject of death
 - Threats; for example, "I won't be around much longer"; writing a suicide note; making direct threat
 - Giving away prized possessions; making final arrangements; putting affairs in order
 - Sub lethal gestures or attempts; for example, overdose or wrist cutting

What to do:

- Provide aid
 - Do not be afraid to ask, “Are you thinking about hurting yourself?”
 - Intervene immediately.
 - Do not keep it a secret.
- Follow the acronym LIFE
 - **Locate help:** mental health, chaplain, doctor, nurse
 - **Inform:** Chain of command
 - **Find:** Someone to stay with the person; do not leave them alone!
 - **Expedite:** Get help immediately, do not wait.

What not to do:

- Do not assume the person is not the suicidal “type.”
- Do not keep a deadly secret. Tell someone what you suspect.
- When speaking with them:
 - Do not act shocked at what the person tells you.
 - Do not argue or try to reason. Do not debate the morality of self-destruction or talk about how it might hurt others as this may induce more guilt.
 - Do not analyze the person’s motives; for example, “You just feel bad because...”
 - Do not try to shock or challenge the person. “Go ahead and do it.” (This only works in the movies!)

Myths and facts about suicide

Myth: Most suicides occur with little or no warning.

Rationalization: If you cannot see suicide coming, there is nothing anybody can do.

Fact: Most people communicate warning signs or invitations for others to offer help. These warning signs may come in the form of direct statements, physical signs, emotional reactions, or behavioral cues. They telegraph the possibility that suicide might be considered as a means to escape pain, relieve tension, maintain control, or cope with a loss.

Myth: You should not talk about suicide with someone who you think might be at risk because you may give that person the idea.

Rationalization: It is best just to avoid it altogether.

Fact: Talking about suicide does not create nor increase risk. It reduces the risk. The best way to identify the intention of suicide is to ask directly. Open talk and genuine concern about someone’s thoughts of suicide is a source of relief and often one of the key elements in preventing the immediate danger of suicide. Avoiding the subject of suicide can actually contribute to suicide. Avoidance leaves the person at risk feeling more alone and perhaps with even less energy to risk finding someone else to be helpful.

Myth: People who talk about suicide do not do it.

Rationalization: There is no need to get involved with people who talk about suicide.

Fact: People who attempt suicide usually talk about their intentions, directly or indirectly, before they act. Four out of five people who commit suicide talk about it in some way with another person before they die. Failing to take this talk seriously is suspected of being a contributing cause in many deaths by suicide.

Myth: Non-fatal acts are only attention-getting behaviors.

Rationalization: These behaviors can either be ignored or punished.

Fact: For some people, suicidal behaviors or “gestures” are serious invitations to others to help them live. If help is not forthcoming, there is an all-too-easy transition between a desperate invitation to receive help and a conclusion that help will never come— between little or no intent to die and a high intent to die. Punishing suicidal thoughts or actions as if they were an improper way to invite help from others can be very dangerous. Punishment often has the opposite effect. Help with problems, as well as help in finding other ways to ask for that help, is far more likely to be effective in reducing suicidal behaviors.

Myth: A suicidal person clearly wants to die.

Rationalization: There is no point in helping. They will just keep trying until they complete suicide.

Fact: Most suicidal people are ambivalent about their intentions right up to the point of dying. Very few are absolutely determined or completely decided about ending their life. Most people are open to a helpful intervention, sometimes even a forced one. The vast majority of those who are suicidal at some time in their life find a way to continue living.

Myth: Once a person attempts suicide, he (she) will not do it again.

Rationalization: I do not need to be concerned now; the attempt will be cure enough.

Fact: Although it is true that most people who attempt do not go on to kill themselves, many do attempt again. The rate of suicide for those who have attempted before is 50 times higher than that of the general population. Fifty percent of people who complete suicide have attempted it before.

Myth: A suicidal person’s need is so great that I cannot possibly make a difference..

Rationalization: They need more than I can provide, so only a specialist can help.

Fact: There are as many reasons for suicidal behaviors as there are people who engage in them. In terms of finding general rules that apply to all people, suicide is very complex. However, understanding and responding to suicidal behavior in a particular person does not require deep understanding of the motivation or circumstances of the suicidal feelings. All that is required is paying attention to what the person is saying, taking it seriously, offering support, and getting help. Many persons are lost to suicide because this type of emergency first aid and immediate support was not offered or available.

Myth: If a person has been depressed (withdrawn and lacking motivation) and suddenly seems to feel better, the danger of suicide is over.

Rationalization: They are better. I will not have to talk to them about suicide or keep my eye on them.

Fact: The outcome of feeling better can go two ways: 1) full recovery as one would hope or 2) increased risk because the emotional conflict over living or dying has been resolved in favor of death. Also, a person who is severely depressed may not have the energy to kill him/herself. A lifting depression may provide the needed energy or give clarity to the perceived hopelessness of continuing with life. Because a person feels "better" resources may withdraw prematurely and

not provide the support necessary for continued progress. Open and direct discussion of suicide is the only way to determine which of these directions applies.

Myth: Improvement following a suicidal crisis means that the suicidal risk is over.

Rationalization: Everyone can relax and not have to deal with the issue of suicide again.

Fact: Many suicides occur following improvement. Suicidal feelings can return. For at least three months following a suicide crisis, be particularly attentive to the individual. Professionals should see patients frequently during this time and assessment for depression, hopelessness, or anxiety should be made.

Myth: Once suicidal, a person is suicidal forever.

Rationalization: There is no way to help eliminate suicidal feelings or hope the person can return to regular duties after a suicidal episode.

Fact: Most suicidal crises are limited in terms of time and will pass if help is provided. However, if emotional distress continues without relief and help is not provided, the risk remains for further suicidal behavior. Professional help should be obtained after which the individual can usually resume normal activities.

SECTION F: LEADERSHIP LESSONS LEARNED

Issue: Units did not deploy with their chlorine residual testing kits

Discussion: Company level units did not deploy with residual testing kits because they mistakenly believed that the battalion aid stations would test the entire battalion's water. The unit leadership did not realize that testing the water is a unit responsibility.

Recommendations: Unit commanders review their responsibilities concerning field sanitation. Commanders must understand that they are responsible for the quality of the water EVEN IF IT COMES FROM AN APPROVED SOURCE. Units must continually test their own water buffalos to ensure that the chlorine residual stays at required levels. It is a maintenance issue. The chlorine level in the water must be tested and maintained.

Issue: Field sanitation and the transition from combat to stability operations and support operations (SOSO)

Discussion: As the brigade combat teams (BCT) transitioned from major combat operations to SOSO, they occupied static positions across the division area of operation (AO). The conditions at BCT forward operating bases (FOB) vary from adequate to primitive. Conditions throughout the AO are improving, but units must be prepared to occupy sites that have little or no sanitation facilities. Slit trenches and field latrines are common, and potable water often has to be brought in daily.

Many FOBs now have portable latrines that require cleaning by civilian contractors. The cleanliness of these latrines varies, and hand-washing facilities must be available to reduce the risk of disease. The use of civilian contractors to provide latrine support presents an unexpected security risk. Large trucks that must enter the FOB several times a week could serve as a means of delivering a vehicle borne improvised explosive device (VBIED).

Those units that do not have portable latrines are burning waste. There is no set schedule or location for the burning of the waste. The smoke from these fires often blows back over Soldiers, and in one case waste was being burned near a dining facility while lunch was being served.

Recommendations:

- Units must have complete field sanitation kits and trained field sanitation teams.
- Adequate hand-washing facilities must be available to reduce the risk of disease.
- Care must be used when burning waste. Wind direction, location, and time of day must be carefully chosen to reduce the risk to Soldiers.
- Units conduct field sanitation training and ensure all field sanitation kits are complete prior to deployment, to include additional mouse and rat traps for pest control and extra lime for waste management. In addition, units must bring additional equipment to construct or repair existing field sanitation facilities.

Issue: Units used vehicles to carry trash to a dump point and then used the same vehicle to pick up Class I and water without cleaning the vehicle

Discussion: Units routinely transport Class I, III and IV on the same cargo vehicle used to transport garbage and trash. Often these vehicles just finish off-loading garbage and trash, then immediately upload Class I, with no time allotted for proper cleaning and sanitation. Without cleaning out the vehicles prior to placing food (even palletized MREs and boxes of bottled water), units jeopardize the health of their Soldiers through possible contamination.

Recommendation: Leaders need to enforce discipline and common sense on even mundane tasks (ash and trash details). Provide these details with the proper guidance and equipment to clean the vehicles in between these two tasks. If this is not available, these two duties should be split as much as possible to avoid cross contamination.

Issue: Preventive medicine and unit food service inspections

Discussion: The brigade food service leadership coordinated with the preventive medicine detachment and Government Service Office to establish a system to ensure that food supplies were edible. The preventive medicine detachment used a USAF initial deployment kitchen (IDK) to check food prior to issue and consumption and manage the shelf life of various food stores.

Recommendation: The preventive medicine detachment is indispensable for ensuring the quality and safety of food. Leaders need to aggressively seek to have the preventive medicine detachment conduct routine inspections of all aspects of food service operations.

Issue: Water testing for chlorine residual

Discussion: Units found their unit field sanitation team members were not properly equipped or trained to execute one of their primary responsibilities - water quality testing in the water buffalos using standard chlorination test kits.

Recommendation: Unit leaders must ensure that chlorination test kits are available for at least a 3-month period. The Soldiers should train at least twice on these systems before deploying. Water with a chlorine content above 5 ppm can cause health problems that can cripple a unit's ability to support its mission.

Issue: Field sanitation supplies.

Discussion: At every battalion location, there were inadequate field sanitation supplies and units were forced to "jury-rig" or improvise latrines and urine pits. Inadequate field sanitation affected the health and morale of the personnel.

Recommendation: The unit should have pre-made field sanitation kits that can be deployed with the unit. Many times, units only train for the Joint Readiness Training Center (JRTC). Field sanitation needs are not addressed. This leads to units not preparing for real-world operations. In addition, a standing operating procedure (SOP) must be established for the field sanitation team.

Issue: Field sanitation

Discussion: Field sanitation became a problem during combat operations. There was a lack of knowledge of using burnout latrines with JP-8, burn barrels for trash and taking showers in the field (using Australian showers). The problem stems from contracting for portable latrines at home station, hauling garbage to a dumpster, and taking Soldiers back to the barracks for showers.

Recommendation: All units should use burnout latrines, burn barrels, and Australian showers at home station and train basic field sanitation tasks. Class IV for constructing latrines and showers should be part of a unit's basic load and included in vehicle load plans.

Issue: Sexually transmitted disease (STD) and pregnancies

Discussion: Although sexual activity is unauthorized while deployed in a combat zone, Soldiers may still partake of such activities. Although condoms are somewhat protective of STD, they are by no means definitive. The only sure way to avoid an STD is abstinence.

Recommendation: The command climate must emphasize that sexual activity is unauthorized while deployed in a combat zone. This principle must be enforced to ensure that Soldiers do not contract STDs.

Chapter 4: Resources/References

SECTION A: PUBLICATIONS

Army regulations (ARs)

AR 11-34, *The Army Respiratory Protection Program*, 15 Feb 1990

AR 40-5, *Preventive Medicine*, 15 Oct 1990

AR 200-5, *Pest Management*, 29 Oct 1999

AR 700-136, *Tactical Land Based Water Resources Management in Contingency Operations*, 1 Apr 1993

Department of the Army pamphlets (DA PAMs)

DA PAM 420-47, *Solid Waste Management*, 1 Jun 1978

DA PAM 40-501, *Hearing Conservation Program*, 10 Dec 1998

DA PAM 40-506, *The Army Vision Conservation and Readiness Program*, 20 Jul 2001

DA PAM 385-8, *Safety Back Injury Prevention*, 1 Jun 1985

DA PAM 385-61, *Toxic Chemical Agent Safety Standards*, 31 Mar 1997

Field manuals (FMs)

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FM 4-02, *Force Health Protection in a Global Environment*, 13 Feb 2003

FM 4-02.17, *Preventive Medicine Services*, 28 Aug 2000

FM 4-25.12, *Unit Field Sanitation Team*, 25 Jan 2002

FM 8-34, *Food Sanitation for the Supervisor*, 30 Dec 1983

FM 10-52, *Water Supply in Theaters of Operations*, 11 Jul 1990

FM 10-52-1, *Water Supply Point Equipment and Operations*, 18 Jun 1991

FM 21-10, *Field Hygiene and Sanitation*, 21 Jun 2000

FM 21-11, *First Aid for Soldiers*, 27 Oct 88

FM 100-14, *Risk Management*, 23 Apr 1998

Graphic training aids (GTAs)

GTA 05-02-029, *Conversion Factors and Formulas*, 3 Aug 1987

GTA 05-08-002, *Environmental-Related Risk Assessment*, 1 Oct 1999

GTA 08-05-047, *Poisonous Snakebite Treatment*, 1 Oct 1990

GTA 08-05-048, *Venomous Arthropods*, 1 Jun 1993

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GTA 08-05-055, *Injurious Plants*, 18 Feb 1994

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GTA 21-08-001, *Risk Management Information Card*, 1 Jun 2000

Technical manuals (TMs)

TM 3-6665-319-10, *Operator's Manual, Water Testing Kit, Chemical Agents: M272*, 30 Nov 1983

TM 5-634, *Solid Waste Management*, May 1990

TM 5-813-3, *Water Supply, Water Treatment*, Sep 1985

TM 5-814-5, *Sanitary Landfill*, 1 Jan 1994

TM 5-6630-215-10-HR, *Hand Receipt, Water Quality Analysis Set, Preventive Medicine*, 15 Jan 1993

TM 10-6630-245-13&P, *Operator, Unit, and Direct Support Maintenance for Water Quality Analysis Set, Preventive Medicine*, 8 Mar 1996

TM 10-6630-246-12&P, *Operator, Unit, and Direct Support Maintenance for Water Quality Analysis Set, Purification*, 1 Feb 1994

TM 10-4610-215-10, *Operator's Manual, Water Purification Unit, Reverse Osmosis, 600 GPH, Models 600-1/3*, 5 Mar 1991

TM 10-4610-229-10, *Operator's Manual, Water Purification Unit, Reverse Osmosis, 150,000 GPH, Model PD 81146*, 5 Apr 1991

TM 10-4610-232-12, *Operator's and Unit Maintenance Manual, Water Purification Unit, Reverse Osmosis, 3,000 GPH, Model WTA-060*, 13 May 1991

TM 10-4610-239-10, *Operator's Manual, Water Purification Unit, Reverse Osmosis, 600 GPH, Models 0996109001/8001*, 5 Mar 1991

Technical bulletins (TBs)

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TB MED 263, *Medical Service, Identification of Inspected Foods*, 16 Jun 92

TB MED 502, *Respiratory Protection Program*, 15 Feb 82

TB MED 507, *Heat Stress Control and Heat Casualty Management*, 7 Mar 03

TB MED 530, *Food Service Sanitation*, 30 Oct 02

TB MED 561, *Pest Surveillance*, 1 Jun 92

TB MED 577, *Sanitary Control and Surveillance of Field Water Supplies*, 7 Mar 86

TB MED 577 (Draft), *Sanitary Control and Surveillance of Field Water Supplies*, 1 May 99

Forms

DD Form 2795, *Pre Deployment Health Assessment*

DD Form 2796, *Post Deployment Health Assessment*

DD Form 2341, *Report of Animal Bite – Potential Rabies Exposure*

DA Form 5161, *Comprehensive Food Service Inspection Form*

DA Form 5161-1, *Food Service Inspection Form – Remarks*

DA Form 5162, *Routine Food Service Inspection Form*

DA Form 5456, *Water Point Inspection Form*

DA Form 5457, *Potable Water Container Inspection*

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40 CFR Part 141, *National Primary Drinking Water Standards*

40 CFR Part 142, *National Primary Drinking Water Regulations Implementation*

40 CFR Part 143, *National Secondary Drinking Water Standards*

21 CFR 165.110, *Bottled Water*

USACHPPM fact sheets

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16-003-0593, *...On Spiders*, May 93

18-008-0302, *Leishmaniasis*, Mar 02

18-009-0403, *Animal Flea and Tick Collars are NOT for Human Use*, Apr 03

18-014-0104, *DOD Insect Repellent System*, Jan 03

22-002-0499, *Stress and Combat Performance*, Apr 99

36-004-0202, *Dealing with the Stress of Recovering Human Dead Bodies*, Feb 02

Others

SHG 003-1203, *A Soldiers Guide to Staying Healthy in Southwest Asia*

SECTION B: ONLINE RESOURCES

Army sites

U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM):
<http://usachppm.apgea.army.mil/>

U.S. Army Health Promotion and Wellness Web Site: <http://www.hooah4health.com/>

U.S. Army Center For Lessons Learned (CALL): <http://call.army.mil/>

AMEDD Lesson Learned (Enterprise Consultancy): <http://ec.amedd.army.mil/>

U.S. Army Entomology Site: <http://chppm-www.apgea.army.mil/ae/>

AMEDD Medical Library and Information Network: <http://medlinet.amedd.army.mil/>

DoD Sites

Armed Forces Medical Intelligence Center: <http://mic.afmic.detrick.army.mil/>

DoD Deployment Link (Deployment Health Support): <http://www.deploymentlink.osd.mil/>

DoD Military Health System Site: <http://www.ha.osd.mil/>

DoD Deployment Health Clinical Center (DHCC): <http://www.pdhealth.mil/main.asp>

U.S. Air Force Institute for Operational Health (AFIOH): <http://starview.brooks.af.mil/afioh/>

U.S. Air Force Center for Knowledge Sharing Lessons Learned:
<https://afknowledge.langley.af.mil/afcks/default.asp>

U.S. Navy Environmental Health Center (BUMED —11): <http://www-nehc.med.navy.mil/>

U.S. Navy Physical Fitness Homepage: <http://www-nehc.med.navy.mil/hp/fitness/index.htm>

U.S. Navy Lesson Learned Center: <http://www.nwdc.navy.mil/>

SECTION C: ACRONYMS AND ABBREVIATIONS

AMS	acute mountain sickness
AO	area of operations
APFT	Army Physical Fitness Test
ATTN	attention
CHPPM	Center for Health Promotion and Preventive Medicine
CL	cutaneous leishmania
DA	Department of the Army
DCU	desert combat uniform
DEET	diethyltoluamide, (75 percent, n-diethyl-m-toluamide)
DNBI	disease and non-battle injury
DOD	Department of Defense
F	Fahrenheit
FAQ	frequently asked questions
FM	field manual
FP	force protection
gal	gallon
GTA	graphic training aid
HN	host nation
hr	hour
HSS	health service support
HTH	calcium hypochlorite, 70 percent available chlorine
IDA	individual dynamic absorption
IV	intravenous
KIA	killed in action
lb	pound
MCL	mucocutaneous leishmania
MCRP	Marine Corps Reference Publication
mg/l	milligrams per liter
min	minute
MOPP	mission-oriented protective posture
MOS	military occupational specialty
mph	miles per hour
MRE	meal(s), ready to eat
MSDS	material safety data sheets
NBC	nuclear, biological, and chemical
NBI	non-battle injury

CENTER FOR ARMY LESSONS LEARNED

NL	no limit
NSN	national stock number
OIF	Operation IRAQI FREEDOM
OEF	Operation ENDURING FREEDOM
PMM	preventive medicine measures
PT	physical training
qt	quart
REF	rapid equipment fielding
RFI	rapid fielding initiative
SOP	standing operating procedure
STD	sexually transmitted disease
TD	traveler's diarrhea
TTP	tactics, techniques, and procedures
U.S.	United States
USACHPPMUS	Army Center for Health Promotion and Preventive Medicine
UV	ultraviolet
VL	visceral leishmania
WBGT	wet bulb globe temperature
WIA	wounded in action

CALL PUBLICATIONS INFORMATION PAGE

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News From the Front: This product contains information and lessons on exercises, real-world events, and subjects that inform and educate soldiers and leaders. It provides an opportunity for units and soldiers to learn from each other by sharing information and lessons. *News From the Front* can be accessed from the CALL website.

Training Techniques: Accessed from the CALL products page, this on-line publication focuses on articles that primarily provide tactics, techniques, and procedures (TTP) at the brigade and below level of warfare.

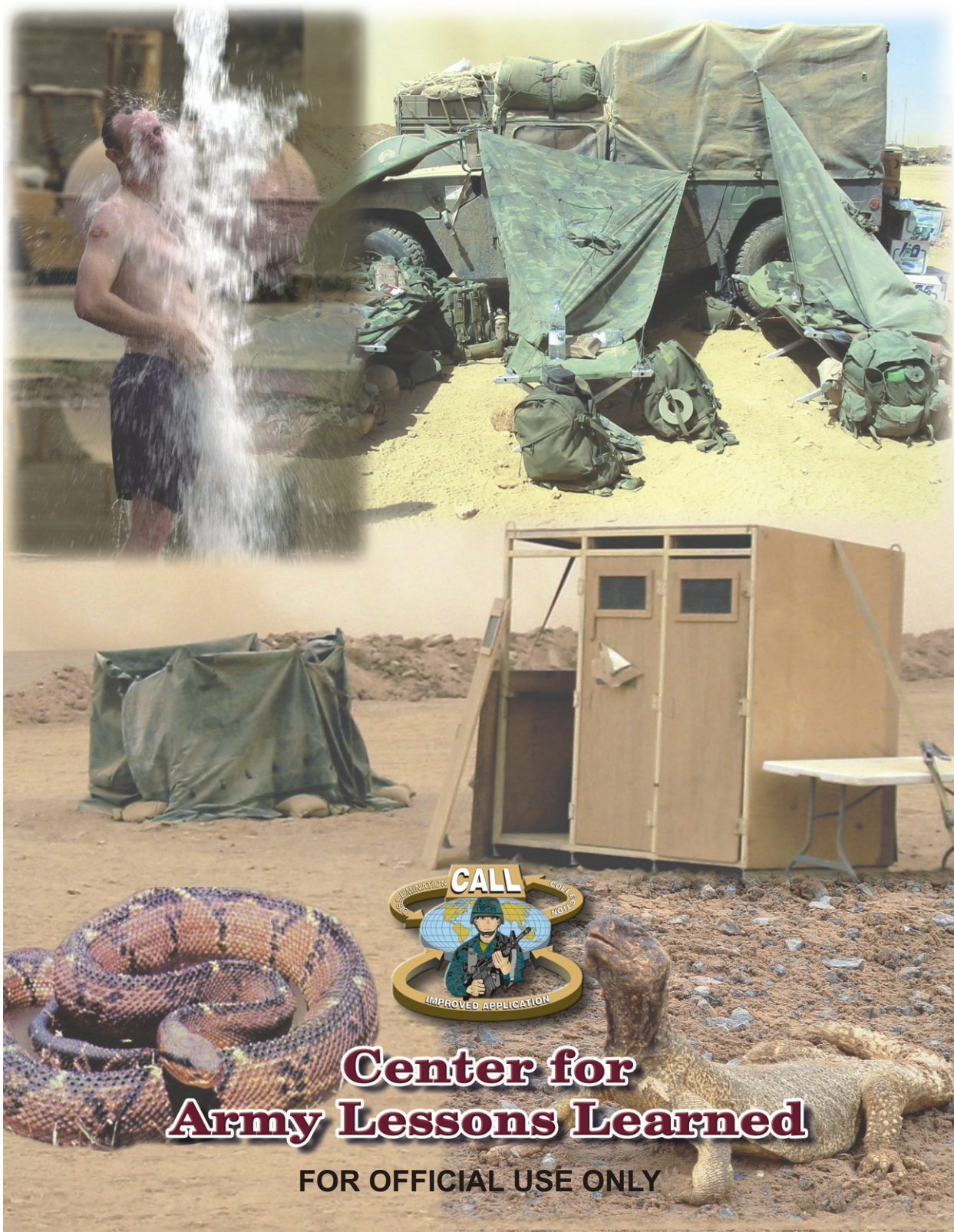
Handbooks: Handbooks are "how to" manuals on specific subjects such as rehearsals, inactivation, and convoy operations.

Initial Impressions Reports: Initial impression reports are developed during and immediately after a real-world operation and disseminated in the shortest time possible for the follow-on units to use in educating personnel and supporting training prior to deployment to a theater. Products that focus on training activities may also be provided to support the follow-on unit.

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