CHAPTER 6

CHEMICAL, BIOLOGICAL, AND NUCLEAR CASUALTIES

6–1. Problems of the Aidman

Casualties produced by chemical, biological, or nuclear operations could pose many problems for you as aidman. The number of casualties will be large. Material to work with will be in short supply. Evacuation will not be available for many casualties. You will have to be able and ready to advise the local commander on the combat capabilities of his troops. Your determination of men's capabilities will be influenced by the tactical situation.

6–2. Casualty-Producing Chemical Agents

The chemical agents that can be used to injure or to kill men are nerve agents, blister agents, blood agents, and choking agents. You need to be familiar with the characteristics and modes of actions of these agents so that you can prepare for the prevention, tentative diagnosis, and treatment of casualties they produce. Nerve agents and blister agents are the ones you are most likely to encounter.

6–3. Nerve Agents

Nerve agents are lethal (fatal) because they are extremely toxic organic componds. They can cause death or disability in minutes. They are essentially odorless and colorless. They range in persistency from those which are highly volatile with low persistency, such as standard agent GB, to those with low volatility and high persistency, such as standard agent VX.

a. One of your duties is to indoctrinate the troops in first aid and buddy aid for nerve agent poisoning. The soldier and his buddy must be able to recognize the primary signs and symptoms of nerve agent poisoning. Self-aid and buddy aid can save lives and reduce morbidity. Treatment cannot be started until a man recognizes something is wrong; after recognition, he will probably have to start treatment himself.

b. After local exposure to nerve agent vapor or aerosol, the pupils of the eyes will be pinpointed. If exposure has occurred through the skin or by ingestion, the pupils may be normal or slightly to moderately reduced in the presence of severe systemic

symptoms. Increased production of secretions results in a running nose and excessive salivation. Tightness in the chest results from constriction of the airway with increased secretions in the tracheobronchial tree. Nausea, vomiting, diarrhea, muscular twitching, drooling, and sweating may occur. These symptoms may progress to convulsions, coma, and death. Respiratory failure is the usual cause of death.

c. Immediately after exposure to a nerve agent, the soldier should hold his breath, put on the protective mask, and clear it. Then he should decontaminate his skin and give himself atropine if he has impaired vision, excessive salivation, trouble in breathing, or muscular twitching. He should check his buddy for evidence of exposure to nerve agent, then continue his mission.

d. Act immediately as prescribed in *c* above to protect yourself. Then, check all personnel for symptoms of exposure to nerve agent. If you find casualties, give atropine until symptoms are alleviated; see *e* below.

e. There are several vital steps in the treatment of nerve agent poisoning. The protective mask must be put on as soon as a nerve agent is suspected or signs or symptoms of such poisoning are recognized. Liquid contamination must be removed immediately from the skin or the clothing. (A decontamination kit is provided for this purpose.) Contamination of the eyes is treated by irrigation with copious amounts of water. Atropine must be used on the appearance of any sign or symptom or nerve agent poisoning because it blocks the internal effects of nerve agents. Every soldier should carry three automatic injectors or syrettes of atropine. In freezing weather, they should be carried next to the body to prevent freezing. When used, they should be injected into a muscle. The injection may be repeated every 10 to 15 minutes if symptoms of nerve agent poisoning persist. Under the supervision of a medical officer, as many as 10 to 20 or more doses over several hours may be required to alleviate symptoms in severe exposure to a nerve agent. Such a patient requires urgent evacuation. The patient should not be considered adequately atropinized until he is dry and flushed and has a heart rate of greater than 110 per minute. Since atropine's effect is short-lived, the casualty must be observed for recurrence of symptoms. Atropine is not to be used as a preventive before contemplated exposure to a nerve agent.

f. If there is respiratory embarrassment, the casualty may require artificial respiration even after injection of atropine. Airway obstruction must be relieved by proper positioning of the casualty's head, removal of secretions or vomit from his mouth, and establishment of an airway. If possible, artificial respiration (modified Sylvester or mask-to-mouth) should be given by some-

one other than the aidman. You should be available to monitor as many persons as possible as long as the threat of nerve agents is present.

6–4. Blister Agents

The blister agents include mustard (HD), nitrogen mustard, lewisite and other arsenicals, mixtures of mustards and arsenicals, and phosgene oxime. This discussion is limited to mustard (HD), a very persistent and standard blister agent, because it is the most widely considered blister agent.

a. Symptoms of exposure to mustard come from its effects on the skin, eyes, mucosal surfaces, and respiratory tract. Exposure of the skin to mustard is followed by a latent period varying with the weather and the degree of exposure. The casualty shows no symptoms for one to several hours after exposure. Then reddening, itching, or burning will occur, followed by blisters. The blisters are second degree chemical burns. Unless the burned area becomes infected, the blisters will heal in from one week to a few weeks. The redness of blister agent exposure should heal in a few days. Some areas of the body heal faster than others. For example, an uncovered area like the face heals faster than a covered area like the buttocks. Prevention of contamination of these burns should receive as much consideration as for thermal burns. Infected mustard burns are treated the same as second degree thermal burns.

b. Severe internal poisoning with mustard may progress to vomiting, diarrhea, and shock. Treatment before symptoms start is nonspecific. Treatment after the onset of symptoms is supportive. The first step in first aid for blister agents is to put on the protective mask for respiratory protection. If the eyes are contaminated, they should be flushed out with copious amounts of water. No other decontaminant should be used on the eyes. The skin should be decontaminated with the decontamination kit the same as for liquid nerve agent. Blisters are treated the same as second degree thermal burns.

6–5. Blood Agents

The blood agents are systemic poisons of the cyanide group. Hydrocyanic acid (AC) and cyanogen chloride (CK) are the main blood agents. They enter the body through the respiratory tract. The central nervous system, especially the respiratory center, is extremely susceptible to their actions. Symptoms of blood agent poisoning include dizziness, headache, trouble with respiration, coma, cessation of breathing, and eventual death. First aid includes putting on the protective mask and giving artificial respira-

tion. Amyl nitrite may be administered by crushing two ampules and inserting them in the face of the mask.

6–6. Agents Used for Special Effects

Chemical agents such as the choking agent phosgene and the tear agents CS and CN may be used for special effects. For instance, phosgene could be disseminated in an area to induce choking among troops. Then a nerve agent could be dispersed among the choking troops to produce casualties. CS and CN may be used in riot control and to force men out of bunkers and foxholes. First aid for these agents consists mainly of putting on the protective mask and wearing it until tests show the agents are not present. If particles of the agents become imbedded in a man's clothing and emit vapors into his face, he should face the wind so that it will carry vapors away from his face. There are no specific medications or treatments for exposure to these agents.

6–7. Mental Incapacitants (Psychochemicals)

Mental incapacitants, or psychochemicals, are chemical agents which disturb normal behavior patterns. They may cause apathy, fear, disorientation, or confusion or so affect mental processes in other ways that the casualty appears psychotic (insane). The management of troops exposed to mental incapacitants will create problems in command and control as well as treatment. You will have no medications to use in treating these casualties. You may be expected to help the commander in managing, controlling, or making the proper disposition of troops which have become casualties. Men wearing the protective mask while a mental incapacitant is being dispersed will not become casualties.

6–8. Biological Operations

Biological operations employ disease-causing organisms to produce human casualties, damage food-producing animals and plants, and cause premature rot of material. Your actions in treating and disposing of casualties with these diseases are the same as for diseases spread by other means. Your biggest problems are in helping the commander in making proper disposition and evacuation of large numbers of casualties. There is little you can do in giving medications for these diseases, but you can do several things to reduce the effectiveness of the operation. You can indoctrinate the troops in the importance of safeguarding food and water and avoiding contaminated food and water. You can instruct them to practice personal cleanliness, control rodents and insects, take prescribed immunizations, and report illnesses and infections promptly. The health of the troops is the commander's responsibility, but he will rely heavily on you for assistance and on the medical service for support.

6–9. Casualties of Nuclear Weapons

a. The aidman's problems in managing or disposing of nuclear casualties are enumerated in paragraph 6–1. In dealing with these problems, compromises must be made. The normal guides for assigning priorities for treatment and evacuation cannot apply in a mass casualty situation.

b. Detonation of a nuclear weapon will produce casualties of three main types: thermal, blast, and nuclear radiation. Thermal casualties will result from the direct effects of the weapon in the form of flash burns. Other burns—secondary or flame burns—will occur in the exposed unit as a result of ignited clothing and material. Flash burns are expected to be first degree, while flame burns will be characteristically second and third degree. Both types of burns must be reevaluated later, but for initial screening and for advising the commander, flash burns are not expected to produce as many serious casualties as flame burns. The number of burned casualties may not be as great as other types of casualties, but they will require more intensive care and put exceptional demands on medical supplies.

c. Blast can be expected to produce more casualties than any other effects of a nuclear weapon detonation. Missiles flying through the air will produce many, varied types of casualties. Glass and other sharp objects will cause lacerations and puncture wounds. Objects such as bricks will cause fractures and contusions. Persons picked up by the blast and hurled against objects may suffer varied wounds. Blast injuries may range from minor wounds to severe wounds with hemorrhage and shock. Your primary duty is first to locate troopers with minor wounds and return them to some kind of duty. The separation of wounded according to type and severity is called "triage and sorting." Initial triage and sorting must be done by you and the commander until more medical personnel arrive. Since you cannot treat all the casualties, you must train as many fellow soldiers as possible in first aid and buddy aid. The better trained men will be valuable in giving emergency medical care if mass casualties occur.

d. Nuclear radiation is of two types. One type comes directly from the fireball. The other type comes from dispersed radioactive particles after the fireball has dissipated. The total amount of radiation received by an individual is more important to you than is the source of radiation. A small total amount of radiation may have little or no immediate effect. A moderate amount of radiation may produce casualties within a day or so. A large amount of radiation may produce casualties immediately. There is no way you can tell when symptoms will appear. A rule of thumb is to

return the soldier to duty until symptoms of radiation sickness appear. Nausea, vomiting, and general weakness are the main symptoms you will use in the field to evaluate casualties during the initial screening, triage, and sorting. Radition injury has no specific treatment and requires long-term medical management and supportive therapy.

CHAPTER 7
COMMON EMERGENCIES

7–1. Foreign Bodies

Foreign bodies are any external objects which may enter the human body. They include shell fragments, bullets, gravel, splinters of wood, and insects. The foreign object may be in the skin, ears, nose, or eyes. The general rule is, if the object can be easily removed, do so; if it is imbedded and difficult to remove, apply a dressing and evacuate the patient.

a. In the Eyes. Foreign bodies in the eyes are common, especially around helicopter and other aircraft operations. Troops are frequently airlifted into and out of operational areas. Aircraft propellers, especially helicopter rotors, kick up dust, grass, or leaves that get into a soldier's eyes, temporarily incapacitating him. The actions for you to take immediately are:

(1) Place the patient in a sitting or squatting position with his head tilted backward against your body to steady him.

(2) Holding the eyelids open with one hand, pour water from your canteen into his eye(s).

(3) If the objects are flushed out, allow him to continue his mission but check on him later.

(4) If the objects do not flush out, lead the patient to a safe area and make a more thorough examination. If the foreign object will stick to a moistened piece of gauze, remove it. If the object is imbedded, do not try to remove it. Apply a dressing over both eyes and have the patient wait in a safe area until evacuation can be arranged. If objects are imbedded in both eyes, apply a dressing over both eyes and evacuate the patient.

b. In the Ears. Foreign bodies that get into the ears are usually insects. Soldiers resting on the ground often complain of insects crawling into their ears. Using a flashlight, you may be able to attract the insect by directing light into the ear. Another thing you can try is to pour water into the ear; that will bring most insects to the surface. At times, in trying to remove an insect, patient will poke a finger into his ear and imbed the insect in ear wax so that you cannot remove it.

c. When to Evacuate. You should evacuate all patients with

foreign bodies in the eyes, ears, nose, mouth, or skin which cannot be removed easily. You have too few tools to work with and the consequences can be too serious to do otherwise.

7–2. Accidental Poisoning

Accidental poisoning in the field is not common. Occasionally, a soldier will ingest food or drink that makes him violently ill. Unfriendly people have been known to poison troops. A soldier may eat food which is spoiled, thinking strange and exotic food is supposed to taste that way. He can be sickened also by consuming a bottled soft drink, such as coke, to which the enemy has added poison. This is done by removing the cap from the bottle, adding poison to its contents, recapping the bottle, and selling it to a thirsty soldier. Another method of poisoning is through the selling of poisonous alcoholic beverages. A thirsty soldier may be sold a nonpoisonous drink, or two, of an advertised alcoholic beverage, then offered a bottle of what is supposed to be the same or a better beverage. While under the influence of the first one or more "good drinks," he consumes the "better beverage." It can contain one of many poisons, the commonest being methyl or wood alcohol. When an individual complains of stomach pain, nausea, vomiting, or diarrhea after eating or drinking some questionable substance, you should suspect poisoning. First aid is as follows:

a. Dilute and flush out. Encourage the patient to drink plenty of water. Filling his stomach with water dilutes the poison. Instruct him to stick his finger behind his tongue to trigger the gag reflex. If he is unable to do this, you can do it for him to induce vomiting. This process may be repeated once or twice, depending on how much foreign material is flushed out of the stomach. Contents of the stomach come out as a clear liquid when it is clean of foreign material.

b. Get powdered milk if available from C rations and make a canteenful of milk. Have the patient drink as much milk as he tan tolerate.

c. Evacuate the patient for further evaluation.

d. Use these same procedures when a patient has swallowed an overdose of medication or drug, but do not flush or cause vomiting if he has swallowed a corrosive agent (acid or alkali).

7–3. Poisonous Plants

Poisonous plants are found in many countries, but are most abundant in areas with heavy foliage. Dense vegetation has plants to which many persons are allergic, such as poison ivy, poison oak, and poison sumac. Skin eruptions and itching may occur hours after exposure. By then the patient may not know which of many

plants caused the condition. You can only treat what you find and caution other troopers to cover their bodies as much as possible. (For specific conditions and treatments, see para 11–9.)

7–4. Snake Bites

Snake bites are unusual, even in snake-infested areas. Generally, a snake will avoid a man unless it is forced to defend itself. If you encounter a snake at close range, do not make any sudden moves. Back away slowly. A snake can strike accurately for a distance equal to about one-half of its length. Both poisonous and nonpoisonous snakes will bite if provoked.

a. Symptoms of poisonous snake bites include the following:

(1) Pain at the site of the bite. In some cases, pain is immediate and severe. In others, pain may be delayed and slight.

(2) Immediate swelling and discoloration.

(3) Early signs and symptoms of shock.

(4) Headache, dizziness, and blurred vision.

(5) Impairment of circulation, respiration, and coordination.

b. If bite is on an extremity, place an improvised venous tourniquet or constricting band above the bite and above the swelling. As swelling advances up the extremity, move the tourniquet above it.

c. Immobilize the bitten area as much as possible. Movement speeds circulation within the area.

d. If a medical treatment facility is less than one-half hour away, do not make incisions. If immediate evacuation is not available, proceed to make incisions parallel to the veins over the fang marks about ½ inch long and ½ inch deep. The incisions should *not* cross. Oral or mechanical suction will help in getting drainage. Remember though, that oral suction by an individual with cuts or sores in the mouth endangers him to poisoning. Be sure to cover the wound with a sterile dressing to avoid a secondary infection.

e. If signs and symptoms of shock develop, start an intravenous infusion of any available solution, preferably Ringer's lactate solution or saline.

f. If there are no serious signs or symptoms, treat the symptoms which are present. Hold the patient for observation and routine evacuation.

7–5. Insect Bites

Insect bites are frequent in the field. They may be merely a nuisance or they may be serious. In persons who are extremely allergic to certain insect bites, severe reaction may follow the bites. If a severe reaction occurs, an oral dose or an injection of Benadryl may help to minimize the symptoms. If the reaction is so severe that respiratory difficulty and unconsciousness develop,

epinephrine must be injected (para 7–6*b*(3)). Artificial respiration may be needed. Urgent evacuation is essential. Itching of a less severe insect bite can be relieved by rubbing tetracaine or another local anesthetic ointment on the skin. Tetracaine ointment could be a useful item for you to carry for men in stake-outs, listening posts, or other places where noisy scratching or slapping at insects would reveal their position to the enemy. However, the use of local anesthetic ointments should not be substituted for the proper use of insect repellents.

7–6. Allergic and Anaphylactic Reactions

Some individuals are highly sensitive to certain substances when eaten, breathed, or injected into the body. These individuals have an allergic reaction of variable degree when they take in a substance to which they are allergic. These reactions, affecting the entire body, may occur anywhere.

a. Urticaria. The common term for urticaria is "hives." This type of less severe systemic allergic reaction involves primarily the skin. Raised areas that itch appear in the skin all over the body. In some areas these are large and even connected to each other, causing generalized swelling of those areas. This is called "angioneurotic edema" and occurs usually in the face. Although the patient with urticaria is uncomfortable, the problem is not usually life-threatening unless anaphylaxis develops (para 11–13*a*). Angioneurotic edema may involve the tongue and, in that way, it could produce suffocation.

(1) Determination of the substance which provoked the urticaria may be difficult or impossible. If it is identifiable, the individual should avoid it in the future.

(2) Treatment involves administration of an antihistamine such as Benadryl. In more severe urticaria, 50 mg. of Benadryl should be given intramuscularly (I.M.). The reaction may take from hours to one or two days to subside, and evacuation may be necessary.

(3) It is critically important to observe patients with urticaria for development of anaphylaxis, which is often fatal.

b. Anaphylactic Reaction. This is the most severe allergic reaction. It produces intense bronchial edema. Breathing may be difficult or impossible. In addition, the circulatory system breaks down due to dilation of the arteries and leaking of the capillaries. Blood pressure falls. Death may result if proper treatment is not given immediately. Antibiotics are the group of drugs which most commonly produce anaphylactic reaction. Yet these reactions can result from drugs as common as aspirin, food allergies, and insect bites. Any time you are to administer a drug to a patient, especially by injection, you should first question him as to allergy

and then observe him at least 15 minutes for possible development of anaphylaxis.

(1) Although urticaria is usually present, the findings to look for are breathing difficulty (wheezing) and circulatory collapse (pulse, blood pressure, state of consciousness). The wheezing may be the limit of the reaction, but the patient must be observed closely until the wheezing disappears. If it worsens, if the patient is having great difficulty in breathing, if he becomes stuporous or comatose, or if his blood pressure drops (weak, thready pulse), immediate therapeutic steps must be taken.

(2) Apply a tourniquet above the injection site or the insect bite. This will help slow or prevent further allergen from getting into the circulation.

(3) Keep the patient breathing by maintaining an airway and using positive pressure artificial respiration if necessary. An emergency surgical airway probably is not indicated because the obstruction involves the smaller bronchi. Epinephrine should relieve the obstruction. An artificial oral airway may be helpful if the tongue is swollen.

(4) Start an I.V., using saline-type infusion to help maintain blood pressure and to provide a rapid route for infusion of drugs. Be prepared to start closed chest cardiac massage if cardiac arrest occurs.

(5) Urgent evacuation must be obtained, and the patient should be accompanied by someone trained in artificial respiration.

CHAPTER 8

SEASONAL HAZARDS—HOT AND COLD INJURIES

8–1. Heat Injuries

Heat injuries are grouped as heat cramps, heat exhaustion, and heat stroke.

8–2. Heat Cramps

Heat cramps are due primarily to loss of salt from the body. Excessive sweating without replenishing salt will deplete body salts. A soldier with heat cramps complains of painful cramps in muscles of his legs and abdomen. Determine the amount of water intake and the amount of sweating. If his water intake is low and sweating is excessive, you can assume he has heat cramps. If you diagnose heat cramps, dissolve two crushed salt tablets in one canteen of water. Let the patient drink as much of this solution as he wants. In 15 to 30 minutes, he should be well if heat cramps are the problem.

8–3. Heat Exhaustion

Heat exhaustion is more serious than heat cramps. Caused by an excessive loss of water and salts from the body, heat exhaustion is a condition, preceding circulatory failure, in which there is not enough fluid to fill the vascular system and tissue spaces. The patient complains of dizziness, headache, weakness, nausea, vomiting, and cramping in muscles of his legs and abdomen. He usually has hot, moist, and pale skin. If not treated rapidly, heat exhaustion may lead to shock (circulatory failure). Once you have recognized heat exhaustion, treat it as follows.

a. Give fluids orally with salt, but do not induce vomiting.

b. In severe case of heat exhaustion, if the patient is nauseated or vomiting, start intravenous infusions of Ringer's lactate solution or saline if available as soon as possible.

c. If vomiting and nausea are present, you may give compazine as directed by a medical officer. (You must have the permission and advice of your medical commander to carry compazine and to dispense it.)

d. If the patient is not stabilized, he should be evacuated as a

priority. If stabilized, he may be evacuated as a routine or given light duty.

e. The best treatment is prevention. As soon as you see a soldier staggering, weak, or sweating excessively, ask him about his intake of water and output of urine. Lack of urine output is a danger signal. You must either notify the immediate commander (so that a rest period can be arranged) or plan on evacuating the patient. Give oral fluids and salt as the patient can tolerate them. (When operating in a hot environment, you should carry salt tablets and an extra canteen of water.)

8–4. Heat Stroke

Heat stroke is a malfunction of the body's heat regulating center in the brain. It is entirely different from heat cramps or heat exhaustion. Because of the patient's exposure to high temperatures, especially if he has been without a head cover, his central nervous system becomes incapable of controlling body temperature. The rectal temperature will be elevated to 106° F. or higher. Other signs and symptoms include headache, dizziness, loss of consciousness, and dry, hot skin. The patient may die quickly unless you take positive measures immediately. His body must be cooled rapidly. You can do this by immersing him in a stream or a canal or by pouring water over him and fanning him. The object of treatment is to reduce the body's temperature to about 101° F. as quickly as possible. The ideal method is to immerse the patient in an ice bath. Since you cannot do that in the field, you should duplicate it as closely as you can. All heat stroke patients should be evacuated as "urgents."

8–5. Cold Injuries

The serious cold injuries include trench foot and frostbite. Prolonged exposure to extreme cold produces severe injuries. Patients with relatively minor injuries must be reevaluated if prolonged environmental exposure to cold is a problem. Patients designated for routine evacuation should be given a higher category after prolonged exposure.

8–6. Trench Foot

Trench foot is caused by prolonged exposure to cold and wetness and by diminished circulation. Trench foot is worsened by keeping the feet still, or by wearing tight-fitting boots. Symptoms include uncomfortable numbness of the feet, clumsiness in walking, tingling and aching, cramping pain, and swelling of the feet. The treatment is to warm the affected parts in warm water or next to a warm body. Remove wet or constricting socks and boots. Do not massage or rub the affected parts; massaging frozen parts

breaks down tissue and aggravates the injury. Cover blisters and frozen areas with a dry sterile dressing applied loosely. Trench foot is prevented by maintaining circulation in the feet. This is done by avoiding prolonged inactivity of the feet and wearing loose-fitting dry socks and boots. If a soldier must stand in one place a long time, force him to exercise his feet to stimulate circulation.

8–7. Frostbite

Frostbite is the freezing of tissue in a localized area. It is caused by a lack of circulation of blood in the frozen area. Constriction of vessels by extreme cold prevents circulation of blood in the involved area. The result is tissue anoxia and death of the tissue. Symptoms of frostbite include an uncomfortable coldness in the affected area, followed by numbness. The skin at first is red, then pale or waxy white. The injured part has no feeling while it is frozen. In severe frostbite, edema and hemorrhage may occur when the part is thawed. First, you should remove all wet or tight clothing from the frostbitten area. Warm the area. The best method of warming is to place the involved area in a water bath at 104° F. If this is not available, the involved area can be warmed by placing it against the skin of some other area of his body or someone else's body. The patient should not be allowed to smoke, because nicotine in tobacco may further constrict blood vessels. Cover the frostbitten area with a loose, dry dressing. Do not try to force circulation to return to the frostbitten part by rubbing it. Treat the man as a litter patient if his feet are involved. To minimize cold weather injuries, rotation of troops is advisable during periods of exposure. They should practice the buddy system of inspecting one another for early detection of frostbite. Troops exposed to extreme cold for a very long time become numb and drowsy, with slowing of reaction time and impaired vision. You should remain alert to these possibilities and be ready to advise the commander on the proper use or the evacuation of patients with cold injuries.

8–8. Immersion

Prolonged immersion of a part of the body in water for hours, even in semitropical and tropical areas, can cause immersion injury (para 11–11). A form of immersion foot also results from immersion of the feet in cool or cold water. The colder the water is, the more rapidly injury occurs. The treatment is to rewarm the patient's feet to normal temperature. Then, if the tissues have been damaged, as in frostbite, the treatment would be similar to that for frostbite.

CHAPTER 9

DRUG ABUSE AND EMOTIONAL PROBLEMS

Section I. DRUG ABUSE

9–1. General

The term "drug abuse" means illicit use of drugs, whether legal or not, to obtain certain nontherapeutic effects. In other words, the drug abuser takes the drug for reasons other than diagnosis, treatment, or prevention of disease. This section discusses briefly medical problems related to drug abuse.

9–2. Categories of Commonly Abused Drugs

Three categories of drugs are commonly abused. Their classification is based upon the effect of the drug on the central nervous system.

a. Depressants. Intemperate use of alcohol is the most common abuse of drugs in this category. Barbiturates and narcotics (such as heroin) also are primarily depressants. These drugs generally give the user a relaxed, tranquil sensation. Used in excess they can produce lethargy, coma, and even death. All are addicting.

b. Stimulants. These are primarily the amphetamine-type drugs. Their usage generally results in increased alertness and euphoria. Excessive use may produce psychotic reactions and death from high blood pressure. These drugs are addicting and they frequently lead to death if excessive use is continued over a period of months.

c. Hallucinogens. These drugs are difficult to classify either chemically or as to effect on the user. Marijuana, which can also be classed as a mild depressant, is the most commonly used hallucinogen, and its effects are generally the least noticeable. Other hallucinogens are LSD, STP, peyote, and mescaline. These drugs tend to produce various degrees of hallucination in the user. The result is a transient psychosis of "trip." Occasionally, the psychosis persists. Generally, these drugs are not known to be directly toxic except so far as the user may be led to behave in a hazardous manner.

9–3. Diagnosis and Treatment of Acute Drug Intoxication

Intoxication depends upon the type and amount of drug used.

a. Depressants. These drugs generally produce lethargy in the user. He may be sleepy, unresponsive, uncoordinated, breathing slowly, and slurring his speech. The narcotics (such as heroin, morphine, cocaine, meperidine, and codeine) often produce constricted or "pinpoint" pupils; alcohol and barbiturates have no effect on the pupils. Alcohol produces a characteristic odor on the breath. Recent needle marks on the body suggest drug injection. Treatment of acute intoxication with depressants is primarily supportive. The usual cause of death among users is respiratory failure. Consequently, you may need to perform artificial respiration (para 3–9) until the patient can breathe on his own. Even if he is breathing when you first see him, be sure he is kept under observation in case the effects of the drug deepen. Induction of vomiting may be helpful if the drug was taken orally in the immediate past. Administration of a stimulant such as coffee may be useful; but more powerful stimulants should be given only by a medical officer.

b. Stimulants. Physical evidence of amphetamine intoxication includes hyperactivity, manic or psychotic behavior, agitation, rapid speech, rapid heart rate, high or low blood pressure, dilated pupils, confusion, restlessness, panic states, and convulsions and coma. Treatment is largely symptomatic and may include induction of vomiting and sedation. However, you should not sedate the patient. Rather, evacuate him as soon as possible.

c. Hallucinogens. As with the other types of drugs it is difficult to list diagnostic physical findings which will tell you the patient is under the influence of a hallucinogen. The physical findings, in fact, may be virtually nothing. Your only clue may be the mental state of the patient. Both depressed and stimulant types of behavior may result. In other words, the patient may be depressed and unresponsive or panicky and hyperactive. He may be completely out of touch with reality. Your best help may come from the patient's story or from the history given by his friends. Treatment is generally supportive, although with severe reactions certain tranquilizers (such as chlorpromazine) may be used. This treatment should be performed by a medical officer.

9–4. Chronic Drug Abuse

It is not the purpose of this manual to philosophize or to moralize about drug abuse. Aside from providing emergency care for the acutely intoxicated drug abuser, there is little you can do to curb chronic drug abuse. Perhaps the most important responsibility you have is to educate the troops about the dangers of drug abuse, especially in combat situations. You should also be able to

advise the commander about the capabilities and limitations of drug users in the field. The Army is developing extensive programs for rehabilitation of chronic drug abusers. Your responsibility is to refer men who come to you for help to the appropriate facility.

Section II. COMBAT EXHAUSTION

9–5. Definition

Combat exhaustion is a transient emotional reaction or disturbance resulting from the psychological and physical stress of battle which is severe enough to make a soldier ineffective in combat. The term "combat exhaustion" is used because it suggests a temporary condition, originating in combat, that may be overcome rapidly. Combat exhaustion differs from normal battle reactions. Normal reactions may appear as increased muscular tension, shaking or tremor, sweating, loss of appetite, and rapid heart beat. Combat exhaustion is a harmful extension of these signs and symptoms. As fatigue, hunger, and fear of battle continue, worry and uneasiness increase. When a soldier cannot cope with these feelings, he develops combat exhaustion.

9–6. Factors Influencing Combat Exhaustion

Various stresses in combat contribute to combat exhaustion. One is the constant presence of danger. Another is frustration and boredom caused by long periods of waiting. Loss of sleep is a factor. So is the rarity of hot meals. Sore feet, minor wounds, and skin diseases also contribute to combat exhaustion. Inadequate orientation of newly arrived troops is another factor. Soldiers may also be upset by propaganda or bad news from home. They may consider the systems of reward and punishment unfair, or be disillusioned with the cause for which they are fighting.

9–7. Signs and Symptoms of Combat Exhaustion

a. Increased pulse rate.
b. Increased muscular tension.
c. Stomach cramps, vomiting, and diarrhea.
d. Abnormal respiration.
e. Heightened reaction to noise.
f. Increased alertness causing sleeplessness.
g. Anticipation of disaster.
h. Hypochondriasis (feigned illness).
i. Extreme changes in mood, ranging from crying and complete breakdown to apathy or complete indifference.

9–8. Prevention of Combat Exhaustion

It takes the combined efforts of the commander, yourself, and your fellow troopers to prevent combat exhaustion. You have the most important part in this. If you are alert, you can detect early

signs of combat exhaustion. That is when you can do the most good for the potential patient. When a soldier complains of vague symptoms, looks nervous, and makes rash statements, you should become suspicious. If these symptoms get worse, you should talk privately with the soldier's platoon sergeant or immediate supervisor. This working relationship between you and the leaders can prevent most cases of combat exhaustion. Leaders should know about the disturbed individual so that he is not assigned to a sensitive task.

9–9. Disposition of Patients

Patients with combat exhaustion should be treated early while they are in their platoon or element. You should enlist the aid of the patient's leaders and buddies in initial treatment. The following are some of the things you can do.

a. Give additional consideration to the patient's wounds or infections. Change the dressings and apply medications. Emphasize reassurance. Show interest in the man and see that he gets rest.

b. Request his immediate commander to give him some words of praise and assurance. Assure the patient that he is needed and appreciated.

c. Do not permit anyone to scold or ridicule the patient. Slapping or otherwise abusing a patient to "bring him out of it" is wrong. The patient would not behave in this manner if he could help himself.

d. Request one of the commanders to reorient the patient as to the mission and his importance to it.

e. If the patient has problems at home, reassure him that you will go with him later to the proper authorities to try to resolve them. Then, do it.

f. Encourage some of his buddies to talk to him and promise to cover him if they are attacked.

g. Do not evacuate the patient unless it is entirely necessary. If it is to the advantage of the patient and the element to evacuate him, do so by resupply vehicle rather than medical evacuation. The patient should not get the impression that he has a serious mental illness or is mentally incapacitated. Irreversible damage can be done to a patient if he is labeled a "psycho." Unless the patient has a complete breakdown, evacuate him to company headquarters for rest and assistance. Evacuate him to a medical facility only when that is entirely necessary.

CHAPTER 10
NONTRAUMATIC DISEASE

10–1. Introduction

Traumatic injuries, such as those produced by bullets and grenade fragments, are relatively easy to diagnose. The problem is usually easy to see. Diseases caused by bacteria or other infectious organisms are much harder to diagnose. Following certain procedures, however, will aid you greatly in discovering and treating the problem. This chapter outlines general principles in approaching nontraumatic, or medical diseases. The remaining chapters in this manual deal with specific medical diseases of each system of organs.

10–2. Examination

a. You can find out much about a patient by using your sight and touch and by asking questions. The appearance of a soldier when you first see him tells much about his condition. You can see if he has trouble breathing. You can see if the color of his lips, face, or fingernails is abnormal. Looking at him, you can tell if he is having a chill. A rash on his skin will be evident to you, too. Touching his skin, you can tell if it is wet or dry, cool or hot. You can ask him what his complaint is, and whether he has had it before. Does he have a headache? Diarrhea? Pains? What kind of medicine has he taken lately?

b. The examination you make differs from the medical officer's mainly in degree of sophistication. Your equipment and assistance are limited. The medical officer in the hospital can request X-rays and laboratory tests of the patient to aid his examination. After making the diagnosis, the medical officer either treats the patient or evacuates him—which are the same actions you take in the field.

10–3. Routine Tests

Sometimes, you need to tell a patient exactly what laboratory test or other diagnostic procedure may be done on him. For instance, to a patient with a fragment wound, you might explain that X-rays will probably be ordered by a physician to determine whether or not a fragment is imbedded in his leg or arm. A simple explanation

of tests and examinations such as the following may help to relieve a patient's apprehension.

a. Blood is taken for cell counts, studies of blood chemistry, crossmatching before transfusions, studies for malaria parasites, and other tests.

b. Urine is collected to detect acidity or alkalinity and the presence of blood cells, sugar, protein, and certain minerals.

c. Samples of feces are studied for evidence of blood, bacteria, amoeba, worms, mucus, and pus.

10–4. Instruments for Examinations

There are many special instruments to aid medical personnel in examining patients. However, you will have few or none of these when you go into the field. You do not need them. A rapid, thorough examination using your own senses is all you need to arrive at the key decision you must make—whether or not to evacuate the patient. Instruments used by medical personnel in the rear, such as thermometers, stethoscopes, otoscopes, ophthalmoscopes, and sphygmomanometers, often do little except put numbers on a medic's findings.

10–5. Principles of Treatment

In treating a patient, you try to do three things: arrest, stabilize, and return to normal.

a. Arrest means to remove the cause from the patient or remove the patient from the cause. If a soldier's clothing is burning, either put out the fire or tear off the burning clothing. If a soldier is in a toxic chemical environment, either remove him from the environment or put the protective mask on him. If a soldier is suffering from heat stroke or heat exhaustion, remove him from the heat and begin to stabilize him. If a soldier has an acute disease with high fever, reduce the fever and continue the treatment.

b. Stabilize means to get the patient into the best possible condition for evacuation or treatment. This could mean doing any of a variety of things. It may mean reducing a high fever, starting intravenous medication, giving oxygen, getting the patient into a better environment, or putting him in a comfortable position.

c. Return to normal is the ultimate goal of medical treatment. This is done by removing the cause of the abnormal condition and helping the body to repair damaged cells, tissues, and organs.

10–6. Fever

Most complaints which bring patients to you will be localized; that is, they will indicate a problem in some specific area of the body. Back pain, headache, cough, pain on urination, and diarrhea are examples of localized complaints. However, one very important

symptom or sign is fever, which is not localizing. Knowledge of the presence of fever is useful to you, because it establishes firmly the presence of disease. It may be the only way you can determine that a patient with vague complaints is really sick.

a. Be sure that fever really exists. Do not take the patient's temperature immediately after he drinks a hot or cold liquid. If he claims to develop fever only at night, invite him to visit you when he has the fever.

b. Fever indicates inflammation (usually infection) somewhere in the body. The most dangerous possibility is meningitis (para 17–8*a*) ; you should always check the patient with fever for a stiff neck. Careful questioning about the major body systems will often reveal the general area of the inflammation (respiratory, gastrointestinal, or genitourinary).

c. Fever itself can be dangerous if it is excessively high (105° F. or higher). In this case you must reduce the body temperature as rapidly as possible. Administer oral aspirin (two tablets) and give the patient alcohol baths, ice water baths, or anything which might cool him. Encourage him to drink fluids since fever also tends to dehydrate the body. Intravenous fluids may be necessary in very sick patients.

d. Lower temperature fevers may be treated with two aspirin tablets every 4 hours. First establish and record the presence of fever in the patient. If he is to be evacuated, note clearly on the records that aspirin has been given and when it was given.

e. Patients with fever must not perform duties. They must rest. Refer them to a medical officer. If the temperature is 105° F. or higher, request urgent evacuation.

10–7. Immunization

Many diseases are easy to prevent but hard to treat. Tetanus and rabies can be prevented by immunization, but once their symptoms appear they are usually fatal. Cholera can usually be prevented with proper immunization. Immunizations prescribed by the Army are effective in preventing many diseases. Every soldier is responsible for receiving all immunizations for his assigned area which are available to him and keeping them current. It is your responsibility to advise the soldier and help him in getting the required immunizations. The immunizations normally given to military personnel are for smallpox, cholera, yellow fever, tetanus, typhoid, poliomyelitis, influenza, diphtheria, and plague.

CHAPTER 11
DISEASES OF THE SKIN

11–1. The Skin

The skin is a tough, elastic structure covering the entire body. It has two principal layers, the epidermis or outer layer, and the dermis or inner layer. The epidermis has a superficial layer and inner layer. The superficial or horny layer consists of dead cells which are constantly being worn off. These are replaced from the living cells which form the inner layer. The dermis is the thicker part of the skin. It consists of connective tissue containing blood vessels, nerve endings, sweat glands, sebaceous glands, and hair follicles.

11–2. Functions of the Skin

The skin is the largest organ of the body. It performs the following functions:

a. Protection. The skin protects underlying structures by acting as a mechanical barrier. When the skin is broken, microorganisms may invade the body through the opening.

b. Regulation of Body Temperature. The skin regulates body temperature by controlling heat loss in two ways.

(1) Blood vessels in the skin change in size. They dilate and bring warm blood to the surface to increase heat loss. They constrict to decrease heat loss.

(2) The skin produces sweat which, when it evaporates, cools the surface of the body.

c. Sensory Perception. The skin acts as an organ of perception. It contains sensory nerve endings specialized to detect heat, cold, pressure, touch, and pain.

d. Secretion. Sweat is salt water which cools the body by evaporation on the skin. It is secreted by the sweat glands which open by ducts onto the surface of the skin. The ducts or openings are called pores. Sweat glands are distributed in large numbers over the body. They secrete an average of 1 quart of sweat a day. The amount of sweat varies considerably, depending upon the atmospheric temperature and humidity and the amount of exercise performed by the individual. Sweating is continuous, but it may be

so slow and the sweat may evaporate so quickly that it is ceptible. Sweat consists chiefly of water (99 percent), wit quantities of salts and organic waste products. The sk secretes a thick, oily substance called sebum, which is prod the sebaceous glands. Sebum lubricates the skin and keep and pliable.

e. Absorption. Although absorption is not one of its functions, the skin can absorb water and other substance drugs may be taken into the body by absorption. Certai agents, for example, are absorbed rapidly through the ski

11–3. Terms Used for Abnormal Skin Conditions

a. Bulla. Large blisters filled with serous fluid.

b. Cellulitis. Infection involving all layers of the skin flammation of the loose cellular tissue that lies under t

c. Dermatitis. Inflammation of the skin.

d. Edema. Excessive collection of watery fluid in tissue.

e. Erythema. Redness of the skin.

f. Folliculitis. Infection of hair follicle(s).

g. Furuncle. A boil.

h. Impetigo. Bacterial infection limited to the epidermis

i. Induration. Hardness.

j. Lesion. Any localized abnormality.

k. Pustule. Vesicle containing pus.

l. Pruritis. Itching.

m. Rash. A temporary eruption on the skin.

n. Ulceration. Open sores on the skin.

o. Vesicle. Small blister.

11–4. Elements Hostile to the Skin

Since the skin is large and constantly exposed to man's e ment, it is certain to be one of your biggest medical pr Weather, insects, disease germs, and trauma are some of tile environmental elements which frequently attack the sk chapter discusses primarily infections and allergies of th Heat and cold injuries are covered in chapter 8, trauma an in chapters 4 and 5.

11–5. Viral Infections of the Skin

a. Verruca Vulgaris. This is the common wart. Ther effective medication for the removal of warts. They can moved by cautery, freezing, or surgery. No way is known vent warts.

b. Herpes Simplex. This infection is called a fever bl cold sore. It usually occurs on the lips, but it may appear parts of the body. It occurs as a small, painful vesicle (

either singular or in clusters. No medication cures or dries up herpes simplex. Treatment is symptomatic (directed toward relieving the discomfort). No way is known to prevent herpes simplex, but the patient can keep it from spreading if he does not scratch it. Never put cortisone-type cream or ointment on these lesions.

c. Herpes Zoster. This is the painful viral infection commonly known as "shingles." It appears as a large group of vesicles along a sensory nerve path. The lesions are very painful. They usually appear on the skin of the abdomen from under the ribs toward the navel. The area of the skin along the path of the vesicles is red and tender to the touch. There is no specific medication for shingles and no method of preventing it. Treatment is directed to relieving pain and discomfort. Never apply cortisone-type cream or ointment to these lesions, for that will only make them worse.

11–6. Bacterial Infections of the Skin

a. Bacteria are single cell forms of life, visible only under a microscope. Most are harmless to man. Some are even necessary to life, like those in the intestines which make vitamins K and B12. Bacteria are always on the skin. It is not possible by any safe method to kill all of them. Many bacteria live on the surface of the epidermis, and most are harmless. The largest numbers of bacteria live in the hairy openings of the skin. Washing with soap and water removes some bacteria. This may be worthwhile if it is not done so often or so roughly that it damages the skin barrier. Pure alcohol kills some bacteria. Most effective is a mixture of 70 percent alcohol and 30 percent water, which is used to sterilize the skin before injections. Iodine solutions are also used to kill bacteria, but care must be taken to avoid iodine burns of the skin. Burns may be prevented by wiping off excess iodine with 70 percent alcohol.

b. Bacteria on the skin need moisture to grow and multiply. In hot, humid weather, bacterial skin infections are common because skin bacteria multiply greatly under hot, moist conditions. The moisture of a cut or scratch also helps the growth of bacteria.

c. The bacteria that cause the most skin infections are staphylococcus aureus, commonly called "staph," and Beta hemolytic streptococcus, commonly called "strep."

11–7. Types of Bacterial Infections of the Skin

a. Impetigo. Impetigo is a bacterial infection limited to the epidermis. It is caused by staph or strep, but often by a combination of both. It begins suddenly, usually on the face, arms, or legs. One or a dozen lesions may be present. Bacteria can lodge on clothing or under fingernails and be spread to other parts of the

body or to other persons. Impetigo is mildly tender to the touch, and it itches or burns slightly. The skin surrounding the lesions appears normal at first, but a ring of redness develops in a day or two. Impetigo may develop in a few hours as a vesicle, a pustule, a bulla up to 3 inches in size, a raw glistening spot, or a crack in the skin. Within a day or so, a soft, soggy, yellow or colorless crust forms that is fairly easy to remove. An infected fever blister, infected hangnail, infected insect bite, cut, or burn at the same site or elsewhere on the body may be the source of bacterial infection. Often there is no preceding skin infection. Since it is superficial, impetigo heals without scarring, but it may leave a red or brown mark which disappears in 2 weeks.

b. Ecthyma. Ecthyma is similar to impetigo except that it goes into the dermis and heals with a scar. Ecthyma has a tough, hard, brown or black crust that is difficult to remove. When the crust is removed, the raw base may bleed. This crust can form again in a few hours. Squeezing or pressing on an ecthyma causes great pain. The raw base leaves an ulcer which is very painful to the touch. Ecthyma may be either a staphylococcic or streptococcic infection.

c. Folliculitis. Folliculitis is an infection of a hair follicle. It is small and slightly tender and contains pus. Although usually due to bacteria, it can be caused by fungi or chemical.

d. Furuncle. Furuncle, or boil, is a staphylococcic infection of a hair follicle and tissue around it. There is redness and pain. At first, there may be only a red lump, but in a few days a yellow "head" develops on the surface. When a furuncle opens, pus, blood and a plug of dead tissue (core) comes out. If the furuncle is small, it heals without a visible scar.

e. Cellulitis. Cellulitis is a diffuse staphylococcic or streptococcic infection of cellular or connective tissue spreading widely through all layers of the skin. It can be a complication of a localized infection, such as a furuncle, or it can occur alone.

f. Lymphangitis. Lymphangitis is an infection with red streaks in the skin going up the lymph vessels of the leg or the arm from ecthyma, cellulitis, or any infected skin lesion. Lymphangitis generally is caused by a streptococcic infection. Chills and fever often occur with it. Regional lymph nodes in the armpit or the groin draining the affected extremity may be swollen and tender.

11–8. Treatment of Bacterial Infections of the Skin

a. The most important procedure in the treatment of localized skin infections is to keep them clean. Gentle washing or soaking in warm water containing surgical soap several times a day is generally ideal. In impetigo and ecthyma the crust must come off. Soaking in warm water should loosen the crust for removal. Pus accumulates under the crust and infection spreads under it. The

crust keeps the edges of the skin from growing together and healing. Usually there is bleeding when the crust of ecthyma is removed no matter how gently it is removed. For noncrusting localized skin infections, such as furuncles or folliculitis, cleansing and warm water soaks are effective. Do not squeeze a furuncle. Squeezing may cause cellulitis to develop. Antibiotic skin creams may be valuable in treating skin infections.

b. Systemic antibiotics are required treatment for nonlocalized skin infections and multiple localized infections. Examples of such infections are more than three lesions of impetigo, more than two ecthymas, and any lymphangitis, cellulitis, or folliculitis if it is sore and painful and several lesions are present. Refer these patients to a medical officer as soon as possible; you should never prescribe systemic antibiotics.

11–9. Fungal Infections of the Skin

a. Fungal infections of the skin are common. Fungi are tiny multicellular plants without roots, stems, leaves, or green pigment (chlorophyll). They feed on dead or living organic matter. Examples of fungi are mushrooms, bread molds, and leather mildew. Although many thousands of fungal species exist, only 20 species of fungi can live on the human skin and produce disease.

b. Fungi that attack the human skin use the dead outside layer for food. As they grow, they digest the dead layer and cause the skin to redden, blister, scale, and itch. They may grow out from the center to get more food, sometimes causing ring-shaped lesions commonly called "ringworm." Patches of blisters and dull, red scales between the toes, soles of the feet, and on top of the feet, ankles, groin, face, and scalp are usually caused by one class of fungi. Yeast (another class of fungi) infects the groin, armpits, anus, buttocks, and any moist, warm area where skin rubs against skin.

c. Fungal infections usually begin as small, red, scaling macules around the feet, ankles, groin, or buttocks. In a few days, they become papular, usually scaling on the advancing edge, and tiny vesicles appear. Mild at first, itching becomes worse as inflammation increases, often waking the patient. Itching of the groin is particularly severe at night. The center of the lesion is less red than the edges, producing the ringworm. The papules enlarge and grow together, forming large areas of dermatitis. The entire buttocks and legs may be involved. When the onset is acute and very rapid, groups of tiny vesicles or pustules are seen. The itching is usually severe. The patient scratches off the tops of the pustules. Then bacteria invade and cause a secondary infection. Crusts and cellulitis may result. On hairy areas, fungus may grow into the hair follicles, causing pustules, small boils, or folliculitis.

11–10. Treatment of Fungal Infections

Antifungal cream (fig 11–1) is used to treat all fungal infections because it is antifungal, antipruritic, anti-inflammatory, and antibacterial. If this cream is not available or the patient cannot tolerate it, you may use 1 percent tolnaftate (Tinactic) solution. Rub the cream gently into the infected areas until it disappears. If you can see the cream after rubbing, you are using too much. It is especially important to rub it in well in the groin and between the toes. After the infection has healed the cream should be used at least 1 week to prevent the infection from recurring.

Figure 11–1. Antifungal medication.

11–11. Skin Diseases Caused by Water Immersion

In hot countries, three types of disabling skin diseases are caused by prolonged wetness of the skin.

a. Type 1 is confined to the soles of the feet (fig 11–2) and is called "warm water immersion foot." This type of warm water damage to the skin occurs where there are many creeks, streams, canals, and swamps to cross with dry ground between them. After about 3 days, the thick outer layer of the skin on the soles of the feet becomes white and wrinkled. Some of the creases in the soles of the feet become very tender on walking. During the next 2 or 3 days, the pain becomes severe on walking and the feet swell slightly. When the boot is removed, it may be impossible for the soldier to put it on again because of the pain and swelling. The pain is greatest on the heels and balls of the feet. The soldier complains that it feels as if he is walking on pieces of rope in the boot. The only treatment is to put the man at rest with his boots and socks off, and to see that his skin is dried and stays dry. In a day or so the wrinkling, whiteness and sogginess disappear. The pain leaves, although the soles of the feet remain tender on walking for a few days. In 3 to 6 days, the thick skin on the soles begins to peel.

b. Type 2 water immersion skin disease (fig. 11–3) is called "paddy foot." This condition involves the tops of the feet and legs. It is common where soldiers have to wade through the muddy rice paddies, swamps, creeks, streams, and canals. In that situation, the exposure to water is almost constant. Drying is prevented by men standing in water or mud or having a heavy coating of mud on their boots. This disease is most prevalent when the temperature of the water or mud remains about 85° F. or higher.

(1) It involves the tops of the feet, the ankles, and the legs up to the boot tops. In 2 or 3 days, the skin turns red, a cellulitis appears, and much swelling occurs. Because of the swelling, there is much pain and tenderness, and the skin is stretched and hard. As a result, it is easily bruised and scaped. Large deeper raw spots or abrasions of the skin may be caused by the rubbing of the boot against the soggy skin. The soles of the feet may not be involved, or they may have some conditions typical of warm water immersion foot.

(2) About one-half of the men will develop tender, swollen lymph nodes in the groin. Mild to moderate fever (100° to 102° F.) may be present.

(3) These patients are treated by getting them to a dry area, removing their boots and socks, and putting them at rest with the feet elevated. It is better not to let them sit, but to insist on them lying down. Within 6 hours the edema becomes soft and pitting, that is, dents show after finger pressure. Pain, swelling, vesicles,

Figure 11–2. Type 1 immersion foot.

lymph node swelling, and fever subside after a few days of rest. Then the skin begins to peel off. This peeling lasts about a week. Occasionally, the abrasions and erosions become infected with bacteria, and some patients develop fungal infections.

(4) This type of immersion foot can be prevented in 9 out of

Figure 11–3. Type 2 immersion foot. Notice the redness and cellulitis.

10 soldiers by drying out the wet skin of the feet and legs for 10 hours. Limiting a combat operation in a wet, muddy area to 48 hours, followed by a drying-out period of 24 hours in a dry place reduces the number of these patients considerably.

c. Type 3 water immersion skin disease involves the upper portions of the legs and groin. Soldiers often must wade through water which is waist-deep and, sometimes, neck-deep. Their trousers may stay wet for many hours. The skin of the groin and inner thighs becomes very red and painful to the lightest touch. The disease is treated—and prevented—by permitting the skin to d

11–12. Pediculosis

Pediculosis is infestation of the skin with lice like those in figu 11–4.

a. Pubic (Crab) Louse. The pubic louse, or crab, usually li in the hair of the pubic region but may be found in hair on otl parts of the body. It lays its eggs on the shaft of the hair. Th lice may be acquired through sexual intercourse, by wearing cr infested clothing, or from contact with infested bedding.

(1) The main symptom is itching. Consequently, fingernail scratch marks are seen on the skin. The tiny, dark lice are visible and move violently when pulled off the hair or the skin. They can be seen and identified better with a magnifying glass.

(2) Treat the infestation with 2 percent diazinon powder with lindane powder. Thorough application is important. Let the medication stay on at least 24 hours. Repeat the application after 1 week and again after 2 weeks.

(3) Infestation by lice is prevented by bathing and dusting with pesticide powder (diazinon or lindane) after exposure. Contaminated clothing and bedding also should be dusted thoroughly with a pesticide.

b. Body Louse. The body louse (pediculus) lives and lays eggs on the seams of a person's clothing and feeds on his skin. It lives on human blood and dies in a short time if denied food. The body

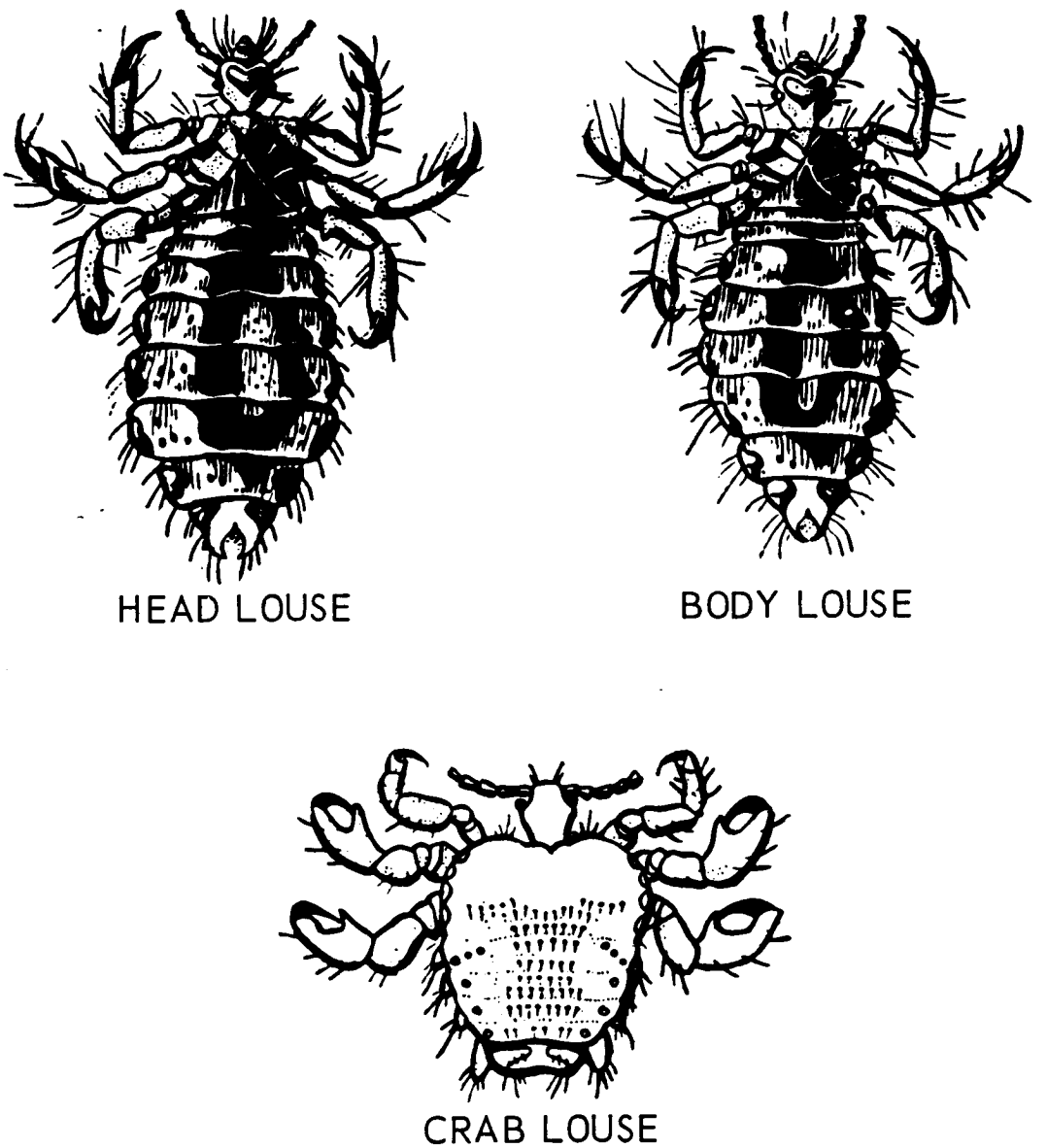

Figure 11–4. Lice.

louse has military importance because it transmits typhus and relapsing fever.

(1) The adult body louse has six legs. The female louse attaches its eggs to fibers of clothing, usually along seams. The eggs are white, oval-shaped, and about the size of the period at the end of this sentence.

(2) Treat the infestation with pesticide powder the same as for the crab louse (*a* above). In addition, dust the patient's clothing thoroughly especially along the seams.

c. Head Louse. The head louse is similar to the body and crab louse in its habits. It carries no known disease but, because of scratching, it is the indirect cause of secondary infections. Treatment for head louse infestation is the same as for crab or body lice.

11–13. Allergic Conditions

In allergic conditions, the soldier is sensitive to some foreign substances which may contact his skin or be introduced into his body in the food he eats, on the air he breathes. A first contact is necessary to cause sensitization. After that the soldier reacts abnormally to contact with the substance. Some substances can provoke an allergic reaction in anyone contacting them. Others cause an allergic reaction only in persons with a constitutional or inherited predisposition to allergy.

ives, is an allergic reaction to substances which ed in, or eaten. Drug allergy is an example of rounded or irregularly shaped, transitory ele- In severe cases, it may appear as general swell- ds, and other parts of the body. Urticaria is with much itching and may cover the whole se is hard to determine, and the reaction may onsists primarily of identifying and avoiding ng the reaction. Other treatments include the drugs, such as Benadryl, and calamine lotion. titis is an allergic condition due to sensitiza- irect contact with a sensitizing substance. The contacted area, itches, and small blisters may d area may become scaly or may have the sh. The blisters may become secondarily in- The reaction appears only in skin which comes with the sensitizing substance, although the to other areas of the skin with his hands. The e may be almost anything, such as poison ivy, or soaps. Treatment includes removal of the antihistamines, bland lotions and creams, and

a. Urticaria, or hi are injected, breath hives. It appears as vations of the skin. ing of the face, han usually associated v body. Often, its caus recur. Treatment co the substance causi use of antihistamine

b. Contact derma tion of the skin by d skin turns red in the appear. The affecte appearance of a ra fected by bacteria. T in direct contact w patient may carry it sensitizing substanc medicines, clothing, allergen and use of cortisone creams.

11–14. Differential Diagnosis

Edema and swelling	Allergy, immersion diseases.
Itching	Fungal infections, allergies, or insect bites.
Pus	Bacterial infections, primary or secondary.
Rash	Allergy, infections such as measles or typhus.
Scaly	Allergies, fungal infections.
Ulceration	Viral and bacterial infections, paddy foot, chancre of syphilis.
Reddening of skin	Infections, water immersion, allergies.
Elevated temperature	Bacterial and viral infections, severe allergies.
Blisters	Viral infections, contact dermatitis.
Pain	Infections, allergies, immersion diseases, first and second degree burns.
Nits or eggs on hair shaft	Pediculosis (crabs).
Hives	Allergies.
Swollen face, eyes, or lips	Severe allergies, kidney disease.
Crusty surface	Bacterial and viral infections.
Chills	Bacterial infection.
Red streaks	Lymphangitis.
Swelling of feet	Immersion diseases, heart failure, or kidney disease.
Whiteness and wrinkling	Immersion diseases.