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SPECIAL FORCES MEDICAL SPECIALIST HANDBOOK

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3D BN, 12TH SPECIAL FORCES GROUP (ABN)

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SPECIAL FORCES MEDICAL SPECIALIST HANDBOOK

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This handbook provides the Special Forces Medical Specialist with a medical reference emphasizing the techniques and doctrine of field medicine, medical civic action, and the medical support of unconventional warfare.

A number of special appendices contain detailed information that is normally difficult to remember or has been inadequately covered during the normal scope of training.

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These appendices include material on veterinary responsibilities, field sanitation, history and physical examination guide, laboratory procedures, therapeutic agents, and survival kit contents.



INTRODUCTION

The purpose of this handbook is to provide the Special Forces Medical Specialist with a handy medical reference especially emphasizing the techniques and doctrine of field medicine, medical civic action, and the medical support of unconventional warfare. This handbook should in no sense be considered a complete text or manual. It will serve the medic best who is thoroughly familiar with its contents and who fully realizes its limitations. It is especially suited for the addition of personal notes by its owner.

A number of special appendices contain detailed information that is normally difficult to remember or has been inadequately covered during the normal scope of training. The appendix on therapeutic agents covers well over 100 drugs and biologicals which the Special Forces Medic may be expected to use in the practice of medicine in an isolated environment. Information on each drug has been reduced to the bare essentials necessary for field type medicine, and should not be considered a substitute for a good pharmacology text. A useful drug index is found at the beginning of that appendix. The veterinary appendix gives special attention to the problems of food procurement and inspections as well as some very general guidelines for the actual treatment of sick animals. Other appendices have conscientiously tried to present hard-to-remember information in an easy to find format so that the book might be both complete and easy to use.

This text is the result of information gathered from Special Forces Groups worldwide.

Office of the Surgeon
United States Army
John F. Kennedy Center for Special Warfare (Airborne)
Fort Bragg, North Carolina 28307

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I. DUTIES AND RESPONSIBILITIES OF THE SPECIAL FORCES MEDICAL SPECIALIST.

A. General Outline of Medical Responsibilities:

1. Medical treatment.

2. Emergency dental and limited veterinary treatment.

3. Medical logistics including medical supply and medical evacuation.

4. Medical training.

5. Preventive medicine including field sanitation and food and water procurement.

6. Medical intelligence.

7. Medical advisor to the detachment commander.

B. Medical Treatment - General Guidelines:

1. Know personal limitations of knowledge, skills, and training and remain within those limits.

2. Utilize most highly trained medical personnel as supervisors and teachers. Use lesser trained personnel to do simpler tasks.

3. Use only those drugs and techniques with which you are familiar.

4. Obtain follow-up whenever possible.

5. Give consideration to tactical and sociological factors when planning and rendering medical treatment.

C. Limited Veterinary Treatment. See Appendix 1.

D. Medical Evacuation:

1. Organization of medical evacuation net.

2. Formulation of medical evacuation policies.

3. Preparation of patients for evacuation.

4. Organization for care during evacuation.

E. Medical Training:

1. Development of POIs, lesson plans, and training aids.

2. Areas of responsibility:

a. Detachment personnel (cross-training).

b. Indigenous personnel (primary and cross-training).

F. Preventive Medicine Responsibilities:

1. Field sanitation measures.

2. Arthropod and rodent control.

3. Personal hygiene.

4. Water purification.

5. Immunization status and program.

6. Food and water procurement.

G. Medical Intelligence:

1. Periodic reports (see Appendix 2).

2. Medical EEI.

3. Area study and assessment (see Appendices 3 and 4 respectively).

H. Medical Advisor to the Detachment Commander:

1. Evacuation policies.

2. Treatment policies.

3. Medical support plans for tactical operations.

4. Preventive medicine and sanitation measures.

5. Further development of medical service as required.

II. MISSIONS - EXECUTION PHASES.

A. Preparation Phase:

1. Area study.

2. Medical processing for overseas movement.

3. Medical training.

4. Medical logistics.

B. Isolation Phase:

1. Continued preparation.

2. Continued information from AST regarding changes in the medical situation.

3. Preparation and presentation of mission briefback (see Appendix 5).

4. Pack medical supplies for initial entry and for automatic resupply.

C. Infiltration Phase:

1. Immediate survey.

2. Disposition of casualties.

3. Initial entry report formulation.

4. Initial assessment.

D. Operational Phase:

1. Medical care:

a. Daily sick call.

b. Physical examinations of indigenous personnel.

c. Civic action program.

d. Emergency dental and veterinary care.

2. Preventive medicine program:

a. Sanitation and water procurement.

b. Immunization program.

c. Insect and rodent control.

d. Food inspection, procurement, and recommended diet.

3. Medical operations and logistics:

a. Provide for medical nets in coordination with detachment commander for the purposes of:

(1) Medical supplies and equipment.

(2) Medical evacuation from operational area.

(3) Medical evacuation within operational area to operational area medical facilities.

b. Anticipate and request medical supplies for future operations.

c. Establish contingency caches as required.

d. Formulate policies for control and distribution of medical supplies and equipment.

e. Formulate plans for expansion of medical treatment facilities.

4. Medical training. Conduct medical training programs for indigenous forces.

5. Administration:

a. When security permits, maintain a coded inventory of area potential:

(1) Indigenous medical personnel.

(2) Medical equipment and supplies.

(3) Medical facilities.

b. Keep a record of controlled medications.

c. Make periodic reports to higher headquarters.

6. Medical intelligence:

a. Continue medical area assessment.

b. Compile medical records and statistics.

c. Gather intelligence on enemy medical service.

7. Special staff functions:

a. Keep detachment commander advised on all medical matters.

b. Present medical portion of detachment briefings.

c. Maintain technical supervision over indigenous medical service.

d. Prepare medical portion of tactical operations plans.

e. Make recommendations regarding the future development of the operational area medical service, physical fitness standards for indigenous personnel, and utilization of the medically unfit.

E. Link-up Phase:

1. Continue medical care.

2. Coordinate with medical personnel in link-up force.

3. Begin plans for demobilization.

4. Continue reports, logistic planning, and intelligence gathering.

F. Demobilization Phase:

1. Continue medical care.

2. Carry out demobilization plan:

a. Disposition of military medical facilities, patients, and medical equipment and supplies.

b. Provision for continuation of military and civilian medical service when possible.

c. Disposition of medical nets.

d. Discharge physical examinations for indigenous personnel.

G. Post-Mission Phase:

1. Request post-mission medical examinations for detachment members.

2. Submit recommendations for medical supplies, training, and equipment to the group surgeon.

3. Replenish medical kits and repair and maintain equipment.

4. Prepare the medical portion of the after-action report and submit to the detachment commander with a copy to the group surgeon (see Appendix 6).

III. MEDICAL CIVIC ACTION GUIDE.

A. Introduction. Civic action may be effectively used in a counter-insurgency or an unconventional (guerrilla) warfare situation. In either case, its precise character and the extent of its use will depend upon the mission and situation. Medical civic action may cover a wide range of programs and should not be limited in concept to providing primary treatment.

B. Characteristics of a Civic Action Program:

1. Meet popular aspirations. The program must be responsive to the desires and needs of the people. A project conceived and carried out by the people will receive more support than one planned and carried out by outsiders.

2. Meet greatest need with greatest effort. If militarily feasible, the greatest effort should be made in geographical areas most threatened by insurgency. Areas recently freed from domination by guerrilla forces should be given a high priority in the civic action program. Often, remote, isolated areas are breeding grounds for insurgency. The inhabitants in these areas have little rapport with their government. The ability of the army to live and operate in this primitive environment makes it a particularly effective agency to demonstrate the government's concern for such remote communities.

3. Be progressive. Initially, short-term, high impact projects will establish the credibility of the civic action program. Where possible, longer range projects should be accomplished in stages to provide some early benefits. This will facilitate intermediate evaluation of the project's effectiveness. However, beware of starting long range projects that will need continuous support. These usually fail. Be very selective when introducing new tools, machinery, and procedures to uneducated people.

4. Respect the culture and religion of the people. The change from traditionality to modernity in the developing countries is very difficult. During this period of evolution, a program to introduce benefits of modern medicine should not negate its value by running counter to the sacred beliefs or customs of the people. Many potentially valuable projects have failed due to lack of respect for these factors.

5. Create a favorable government image. This is the dominant characteristic of a successful civic action program. The program must impress the people with the capability and determination of the legitimate government to aid its citizens in attaining a better life. The program must not promise or imply progress that it cannot provide.

6. Exhibit government unity. The projects must be designed and executed as a joint venture with or in support of the government agency having jurisdiction over the project. Projects should be initiated in the name of the responsible government agency. If misunderstandings or disputes occur between government agencies or representatives, they must be settled as quickly and quietly as possible. The program must not provide agitators with examples of lack of government unity.

7. Enlist the people's participation. The civic action program must be designed to help the people help themselves. The long range success of such a program will be measured by the extent to which people carry on with self-improvement once the military assistance is withdrawn. Only if the people are sufficiently motivated to participate actively in the program, and are permitted to do so, will they derive lasting benefit from it. Participation may be in the form of direct labor, monetary, or material contributions. Such contributions must be equitable, and show a clear relation between cost and benefits. Subsequent maintenance for completed projects must also be provided.

8. Encourage private enterprise. The most valuable resource of a country is the ability of its people. Of the greatest importance to a developing country is a rising class of private businessmen. A program or project should be planned to encourage private business and give it a chance to grow.

9. Keep the military aspect in mind. Projects should be designed to retain a military advantage. For example, medical facilities should be placed and planned to facilitate their defense and protection from sabotage and attack.

C. Planning and Execution of Civic Action Programs:

1. A civic action program should be planned and carried out in phases. It is important to avoid overloading the people with supplies and equipment. Much can be achieved by well planned but simple projects. Expensive and impressive major projects often fail. Civic action programs will be successful if based on the needs of the people and tailored to the availability of resources and personnel. In planning a civic action program, the following steps should be considered:

a. Preparatory phase.

b. Action phase.

c. Termination phase.

d. Evaluation phase.

2. In the preparatory phase the following steps are recommended:

a. Select. Select a village or area that is in need of assistance.

b. Visit. Visit the selected village or area. At least two visits are advisable. The first visit to a village should be conducted to pay courtesy calls on the village leader and prominent people of the village. Do not talk business on the first visit, just make friends. Later visits may be made for further familiarization and the conduct of business. Tell the village leader your intentions. Deal directly with the village leader, not with his subordinates. Be sure he understands that his people must share the workload.

c. Inspection and survey. Inspect and survey the village. Request the village leader to accompany the inspection and survey various projects which need to be undertaken.

d. Evaluate. Evaluate the information collected during the inspection and survey.

e. Coordinate. It is of utmost importance to insure that local government agencies know well in advance what projects are being considered. They should approve any project before it is undertaken. This will ensure their continued support after you are gone and many times will preclude later embarrassment.

f. Plan. After all preceeding steps have been accomplished, plans must be made. The civic action participants must realize from the start just what is to be achieved. During the planning phase the following should be accomplished:

(1) Obtain all anticipated medical supplies and special equipment.

(2) Outline duties of each civic action participant. Remember, the success of most projects will be assured if large, local, enthusiastic participation occurs.

(3) The following organizations and firms may be of great assistance and should be contacted for any support they can give. Before asking for support from these firms or organizations, the local representatives should be briefed on what is to be achieved.

(a) Local factories.

(b) Supermarkets and general stores.

(c) USAID and US Information Service.

(d) US embassy.

(e) Peace Corps.

(f) Red Cross or equivalent.

(g) Hospitals and drug firms.

(h) International firms, i.e., Pepsi Cola, oil companies, etc.

(4) Generally speaking, education of the people is an important early step. If classes are to be given (they must be outlined and referred in advance) the following topics should be considered:

(a) Personal hygiene, village sanitation, and water treatment.

(b) Common emergencies, first aid, self aid, and artificial respiration.

(c) Pre- and post-natal care and baby care.

(d) Animal care.

(e) Insect and rodent disease control.

(f) Hot and cold weather injuries.

g. Organize:

(1) Screening and recording team.

(2) Emergency treatment team.

(3) Instructors and village improvement team.

(4) Immunization team.

3. Phase II (Action Phase).

a. Perform.

(1) The degree of freedom given to the medic will vary according to his medical experience, personality, relationship with the people he is treating, and the detachment commander. The performance step may include one or more of the following:

(a) Screen and record. It may be of great importance to screen and record certain statistics on prevalent diseases in the area and on persons who have or have not been immunized against various diseases.

(b) Treat. When performing medical civic action, a thorough knowledge of the medical situation is a requirement. Also, the medic must always keep his limitations in mind.

(c) Isolate. Medics may be called upon to work in epidemic areas and must fully understand isolation techniques and how to apply them.

(d) Immunize. It is imperative in all medical civic action programs to start an immunization program. It is most important to convince the indigenous people of the need and effect of vaccinations. This will counter enemy propaganda which will attempt to convince the people that immunizations will adversely affect their health (impotence, loss of strength, etc.).

(e) Instruct. Instructing the villagers on various subjects may be the main civic action mission. An instruction program can be undertaken by medics moving from village to village.

(2) While working in a village of primitive people the following tips may be of assistance:

(a) If one approach is not effective, try another one.

(b) Do not start anything you cannot fully support.

(c) Avoid long-range promises.

(d) Have all anticipated supplies on hand or available before you start a project.

(e) Do not be concerned if the villagers do things differently from what you propose. Good end results are what count.

(f) When treating a patient make sure that he understands your instructions. Have the patient repeat your instructions to insure that he understands. Make your instructions simple. When the situation permits, give injectable medication (to insure proper administration), or if oral medication, give only a one day supply to each patient. One may also insure administration by watching the drug being swallowed. Good drug control is important because it controls the amount of medication leaving the village. There have been cases where villagers would seek treatment in order to use medicines for trade and even give or sell to the enemy. It affords a means of controlling treatment and provides an opportunity to evaluate the effectiveness of treatment by frequent follow-up visits.

(g) When using an interpreter, brief him on his duties. Let him know from the start that his only function is to communicate information from the medic to the villagers and from the villagers to the medic. To aid him have a working knowledge of the language, use short complete sentences, avoid slang or big words that may confuse the interpreter, and know his linguistic capabilities and limitations.

(h) Insure that the host receives credit for all items distributed and projects completed.

(i) Observe and respect the local customs of the country. If possible, you should participate in local activities. Some of the customs may be contrary to your beliefs, but in order to further your relations with the local populace you must be able to give something in order to gain something. Conduct yourself as a gentleman at all times. When participating in social functions, know your limitations. Do not become involved with village women. This is often difficult, but is an absolute must in order to maintain effectiveness in relations with indigenous people. Do not be arrogant, sarcastic, or belittling in your conversation. Most people are proud and may be hypersensitive. Your work must not be jeopardized by ignoring these facts. Show exceptional kindness to the children and the very old. Be courteous and relaxed when working with the villagers. Accept food and drinks, as long as it seems to be safely prepared, even if food is distasteful to you. By offering to share what little they have with you, the villagers show their hospitality and friendship. By accepting it, you show that you are their friend. Do not think yourself to be better than they are.

Be cautious about being in too much of a hurry. Try to maintain a friendly relationship with counterparts, village leaders, etc. If disagreements arise in nonemergency matters, make a socially acceptable reason for postponement of discussion. Approach the subject later in a diplomatic manner. Don't force things!

(j) Show movie films. Show films which are simple, to the point, and interesting. Try to follow a teaching film with an entertainment film in order to maintain the interest of the audience. Experience has proven that most villagers love to watch American films even when they cannot understand a word of English. A PA system is a great asset to enable the interpreter to give the general plot.

b. Collect information. The treatment facility in a civic action program is a valuable place to collect many kinds of information. The medics will normally come into contact with many people who can provide important non-medical information. The medics should acquaint themselves with methods used in the collection, evaluation, and dissemination of information of intelligence value.

c. Publicize. The host government should be given credit for the projects completed. *Only then can the image of the host government* be improved. In many countries, the USIS will have facilities available. Notification should include the following (through the unit public information officer):

(1) Description of project.

(2) Location.

(3) Inclusive dates and times.

(4) Identification of military participation by number of personnel, unit, type of equipment, and projects being undertaken.

4. Phase III (Termination Phase): Civic action support should be withdrawn in stages, so that the villagers will be able to adjust to the changes in becoming self-sufficient. During this phase the medic should:

a. Outline future projects to be accomplished by the villagers and insure that personnel are clearly and permanently organized by job specialty such as medical instructors, aidmen, midwives, and preventive medicine teams.

b. Encourage the villagers to be as self-sufficient as possible.

c. Insure that proper channels for necessary continued governmental support are well established.

d. Assemble the villagers and explain what has been accomplished and what you expect them to achieve in the future.

e. Arrange periodic inspection trips back to the village to insure compliance with your instruction.

5. Phase IV (Evaluation Phase): Inform the detachment commander on accomplishments of the civic action program by preparing an after-action report which includes the following data:

a. Projects undertaken and completed and recommendations for future projects.

b. Difficulties encountered.

c. Patients treated by number, age, sex, diagnosis, treatment, prognosis, and disposition.

d. Number of persons immunized.

e. Most prevalent diseases of the area.

f. Medical instruction presented.

g. Problem areas and solutions.

D. Civic Action in Conjunction with a Paramilitary Training Mission. Special Forces operational detachments may be introduced into a selected training area to provide paramilitary training. The medic's primary duties and functions in this situation are:

1. To provide medical support to the Special Forces detachment, attached US personnel, and indigenous trainees.

2. To train indigenous village medics to support various types of paramilitary units.

3. To conduct medical civic action as directed by the detachment commander.

4. To provide emergency treatment to families of indigenous personnel.

5. To provide any other medical support which is deemed necessary to successfully complete the operational detachment's primary training mission.

E. Small Scale Medical Civic Action Projects:

1. Public health. Village sanitation offers the greatest possibilities for achievement and improvement. It must be re-emphasized that adult education is of great importance. The villagers must understand both what and why various programs are desirable. Medical personnel can provide instruction in the:

a. Destruction of homeless, vicious, and unwanted dogs.

b. Cleaning of streets, cutting grass, disposing of rubbish, and raking under houses.

c. Initiation of an insect eradication program. In some of the areas malaria is still a problem. Villagers can do much in controlling the breeding places if they are taught how to start a DDT program, use sprayers, mix solutions, and clean out or fill unneeded water holes.

d. Installation of latrine and bath facilities.

e. Prevention of livestock from entering living areas.

f. Procurement and purification of water.

g. Immunization of villagers and domestic animals.

h. Techniques of making soap:

(1) Ingredients:

(a) Method one. Two number 10 cans animal fat, two number 10 cans of water, and one number 10 can of lye.

(b) Method two. Two number 10 cans animal fat and two number 10 cans of water poured through ashes.

(c) Optional additives. One-half (5 oz.) Borax, one-half cup kerosene, one-half cup liquid washing ammonia, and two tablespoons granulated sugar.

(2) Technique:

(a) Cut the fat into small strips and place into a pot to melt over moderate heat.

(b) To the melted fat, slowly add either the lye and water or the water poured through ashes and stir until the mixture is approximately the consistency of honey. Optional items may be added during this step.

(c) Pour the thickened mix into a container and let stand until cool. After a few hours, the soap may be cut into desired sizes. Allow the soap to stand in the container for several days, then remove and store.

(d) This type of soap is excellent for both laundry and strong hand soap.

2. Treatment facilities. Small aid stations or dispensaries can be set up in villages, fixed type buildings, tents, or any other suitable facility. "One-shot stands" should be avoided. If a village is to receive medical treatment, it should receive it on a permanent or at least, regular basis. Medics should be able to:

a. Provide emergency medical and dental treatment.

b. Provide evacuation of seriously ill or injured persons to a more elaborate medical facility. In some cases it may be more advantageous to request professional assistance to come to the village, rather than to resort to evacuation.

c. Establish and operate an immunization center.

d. Provide assistance to the public health service in the area.

e. Provide adequate medical supplies to accomplish the medical civic action mission.

f. Train villagers to assist in first aid.

g. Prepare, classify, and preserve the records of sick and injured persons for higher headquarters and use in future planning. Information pertaining to outpatients and bed patients should be recorded and categorized into one of the following categories:

(1) Respiratory.

(2) Eye, ear, nose, throat.

(3) Gastrointestinal.

(4) Genito-urinary.

(5) Venereal.

(6) Dermatological.

(7) Battle and non-battle wounds.

(8) Surgery and special treatment.

(9) Dental.

(10) Infectious diseases.

(11) Dietary deficiencies.

(12) Worm infestations.

(13) Burns.

3. Animal clinic. A small animal clinic can be established and operated concurrently with the aid station. In many primitive parts of the world the detachment medics are expected to treat both humans and domestic animals. Medics should be able to:

a. Diagnose, treat, and immunize domestic animals to a limited extent.

b. Establish contact with a veterinarian for treatment and preventive medicine measures.

c. Train villagers to administer first aid and to recognize serious contagious diseases in domestic animals.

d. Compile and classify veterinary information for the use of higher headquarters in future planning.

e. Deworm and delouse domestic animals.

IV. UNCONVENTIONAL WARFARE OPERATIONAL AREA MEDICAL SERVICE GUIDE.

A. Introduction. There are no hard and fast rules governing medical service in unconventional warfare. Area medical support will be as simple or as elaborate as necessary and feasible for the accomplishment of the mission. The success or failure of the area medical service will depend on the skill and ingenuity of the individual medic and the support of the detachment commander.

B. Aims and Functions:

1. The aims for Special Forces medical support in the UWOA are to:

a. Conserve manpower and improve morale.

b. Deny information to the enemy and gather medical intelligence.

c. Improve relations with civilians.

d. Provide medical treatment, evacuation, and supplies and equipment.

2. These aims are accomplished through the following functions:

a. Medical care.

b. Hospitalization and convalescence.

c. Return of recuperated personnel to duty.

d. Supply of medical items.

e. Evaluation of the medical area.

f. Preventive medicine program to include immunization, rodent eradication, sanitation, and nutrition.

C. Characteristics of UWOA Medical Service. Variations in medical requirements of guerrilla units are due to the size and stage of development of the guerrilla unit, the support of the local civilians, and the medical personnel and facilities available. The medical service of guerrilla units differs from that of conventional units in the following aspects:

1. Battle casualty incidence is normally lower.

2. The incidence of disease and malnutrition is usually much higher.

3. Other peculiarities and differences:

a. Psychological factors. Due to high motivation and adaptation to hardship and discomfort, guerrillas frequently have been observed to ignore minor illness and injury. Resultant lack of medical attention can lead to serious illness and disability later on. This may be a significant cause of reduced effectiveness of the unit.

b. Local health standards. In many areas, health will be substandard compared to the US. Indigenous people may not accept an immunization that is desirable for our soldiers, because of religious beliefs or superstitions; on the other hand, they may have acquired immunity to diseases in the area.

c. Living standards. The majority of the world population has a much lower standard of living than the US and may not impair daily functioning for those who have become accustomed to it, but may have significant effect on US personnel who may be unable to adjust to such conditions even if necessity requires it.

4. Security is more important.

5. Casualties in UW combat operations must be considered tactical problems, not merely logistical ones.

6. The following health measures may be necessary for guerrilla troops who are found to be undernourished and disease ridden:

a. Blanket treatment for malaria followed by Chloroquine-Primaquine Prophylaxis.

b. Daily use of vitamins.

c. Diagnostic tests such as stool exams and blood exams when specific diseases are suspected of being present in a large percent of these troops.

D. UWOA Medical Service.

1. Personnel:

a. Detachment medics.

b. Special Forces Company Medical Operations Section (infiltrated into the UWOA when required).

c. Additional US medical personnel. Non-organic detachment personnel may be requisitioned and infiltrated to meet specific needs in a particular area.

d. Indigenous professional medical, dental, veterinarian, and para-medical personnel.

e. Untrained indigenous personnel with quasi-medical backgrounds such as undertakers.

f. Non-medical indigenous personnel. Utilization of non-US civilians in an operational area may be an effective way of supplementing available military manpower. Procurement sources for such personnel include civilians of the allied, co-belligerent, and enemy countries in which the detachments may be operating, and also the nationals of neutral countries who may be present in the operational area. Maximum utilization of these personnel should be exercised consistent with security, operational requirements, and essential needs of the guerrilla forces. These personnel can be used as cooks, drivers, litter bearers, laborers, etc.

g. Prisoners of war. POWs can be utilized in both medical and non-medical positions, provided the security of the guerrilla unit will not be compromised.

2. Equipment and supplies:

a. Organic medical kits and supplies.

b. Resupply may be on call, automatic, or emergency.

c. Indigenous medical supplies and equipment may be procured by offensive operations (raids) and battlefield recovery, levy, barter, purchase, confiscation, or black market.

d. Improvisation. Home-made equipment and drugs.

e. Gifts. In some cases guerrillas obtain supplies as gifts from friendly civilians, but they cannot be relied upon to provide any large quantity of supplies and may not be available when needed.

f. Looting. Guerrilla units have, in the past, relied on looting to fulfill many ot their supply requirements. This is not a desirable means unless confined to the establishments of known government sympathizers.

3. Facilities. Depending upon the stage of development of the area command, virtually any shelter from caves, tents, and huts to well-equipped city hospitals can be used as treatment facilities.

4. Transportation. Guerrilla units must use every possible means of transportation. Movement by foot is almost always the primary means. Indigenous transportation (motor, animal, boat, etc.) may be used to some extent. This system relieves the guerrillas of the necessity of operating and maintaining their own transportation. It also has advantages from a security standpoint; for instance, a truck or wagon belonging to a local grocer will arouse less suspicion than a vehicle that the enemy does not recognize. If the enemy requisitions all civilian vehicles, transportation organic to the guerrilla force may have to be developed. The detachment medics must keep transportation factors in mind when formulating evacuation plans. One or more alternate plans are necessary.

5. Logistics. In order to be successful, the logistics system must be simple and streamlined. Equipment should be mobile and supply locations must be kept to a minimum. Care of convalescent and lightly wounded patients should be carried out "on the economy" utilizing the auxiliary and underground. Air dropped supplies should be dropped a safe distance from the hospital when air drops are available. The importance of security on air drops cannot be overemphasized. Caches should be used extensively and be closely coordinated with tactical plans.

E. Maintenance and Repair Services. In an UWOA, the difficulties of supply procurement dictate rigid supply discipline. All personnel must be trained in organizational maintenance. Plans must provide for the maximum use of available supplies and for the establishment of repair facilities to prolong the life of equipment. Repair items that cannot be obtained in the operational area must be anticipated and included in the supply forecast. Guerrilla units invariably become adept at making many items. The auxiliary is invaluable in these efforts.

F. UWOA Medical Organization. A complete guerrilla medical organization combines the overt medical organization of the guerrilla units and the clandestine medical organization of the underground into a single, smoothly functioning area medical service (see Appendix 7). This chart is a broad guide and the precise organization in any given UWOA must be designed to best fit the situation. In the early stages of guerrilla warfare the hospital facility (see Appendix 8) is either completely absent or is found as part of the clandestine organization run by the auxiliary. In later stages,

with well organized guerrilla units, one or more hospitals may be established as part of the formal guerrilla organization. Even convalescent camps can be run by guerrilla units. If a well developed auxiliary and underground exists, a better solution would be to farm convalescents out "on the economy".

1. Guerrilla medical organization. Patient flow will be organized and medical facilities of various types will be established and located in relatively safe areas separated from tactical units as much as possible. They will be guarded and supported by units assigned for that purpose. The units in the guerrilla medical organization should include:

a. Unit aidman. Approximately one per fifty men.

b. Guerrilla medical detachment. Regardless of the size of guerrilla units, medical detachments retain essentially the same structure and function. Duties are:

(1) To maintain the health of the command.

(2) To treat and evacuate casualties.

(3) To insure the earliest possible return of the sick and injured to duty.

(4) If feasible, to treat auxiliary and underground elements, and perhaps even to the general population of the area.

(5) To maintain an active preventive medicine program.

2. Clandestine organization.

a. General. Depending on the situation, only "emergency type" medicine may be practiced. Patients with proper cover stories may be infiltrated into enemy, civilian, or military hospitals to receive the best available care. A wounded guerrilla allowed to fall into enemy hands can be forced to reveal what he knows and compromise the entire mission. To operate a successful clandestine medical (supply or evacuation) net, it must be secure. The nets must be protected and secured at least as well as other operational nets. The medical net should also be simple. Clandestine facilities must initially be confined to emergency and expedient care with minimum preventive medicine. Utilizing fixed facilities should not be attempted initially as a general rule. Once the area command has developed

sufficiently, the clandestine facilities can be allowed to "evolve", become more elaborate, and become part of the unit's medical organization. In conventional military medicine, a huge medical organization is available to anyone in need. In clandestine medicine, certain other factors must be considered, among them the availability of the following:

(1) Medical personnel. Professional and non-professional.

(2) Facilities. Location, type, site, and condition.

(3) Safe houses. Location, ownership, size, and facilities.

(4) Medical supply sources. Location, type, and quantity.

(5) Transportation. Location and type.

b. Surveillance. Medical personnel, supplies, facilities, and safe houses must be reconnoitered and placed under surveillance to determine their value, availability, and sympathies of indigenous personnel. Other security aspects must be considered with particular attention to the vulnerabilities of the planned medical net.

c. Organization. The medical net is kept as simple as possible, just elaborate enough to provide security and to fit the estimated needs of future expansion in the particular area. After the net is functioning and is determined to be secure, it can then be refined and modified as needed to meet changing area requirements. In the actual creation of a medical supply or evacuation net the following factors should be considered:

(1) Scale of activities already in existence and those planned for the future.

(2) Increase in strength along with increases in activities and operations.

(3) Physical factors including topography, climate, geography, transportation, and communications.

(4) The number, availability, and dependability of medically qualified and semiqualified personnel in the area.

(5) The general attitude of the population, government, and resistance towards medical problems, and the medical standards accepted in the area.

(6) Existing non-medical operational facilities of the area command. Intelligence and security nets could be helpful in establishing a separate medical net and may also be used for collecting medical intelligence. The logistics net may be helpful in the medical supply portion of the medical net providing sources of supply and transportation.

(7) The capability of the enemy to detect clandestine nets must be fully considered and appropriate counteraction taken.

3. Facilities. The chain of evacuation and medical treatment in the UWOA medical net usually consists of three essential sections:

a. The aid station, part of the guerrilla unit, is run by the guerrilla medical detachment and responsible for:

(1) Emergency medical care.

(2) Initial evacuation of casualties.

(a) Every effort is made to evacuate wounded personnel from the battle area. The condition of wounded may preclude movement to the unit base. In this event, the wounded may be hidden in a predetermined secure location and the local auxiliary unit notified. The auxiliary then will care for and hide the wounded, or further evacuate them to a treatment facility for definitive treatment.

(b) The evacuation of the dead from the scene of action is most important for security reasons. The identification of the dead by the enemy may jeopardize the safety of their families and units. The bodies of those killed in action are evacuated and cached until they can be properly buried or disposed of by whatever means is consistent with the customs of the local population. Removal of the dead will also deny the enemy intelligence concerning guerrilla casualties.

(c) As the operational area develops and the overall situation favors the sponsor, evacuation of the more seriously injured or diseased personnel to friendly areas may become possible. This will lighten the burden upon local facilities and provide a higher standard of medical care for the patients.

Although air evacuation is the most likely means, an important disadvantage is its inherent threat to security. Landing sites should be located well away from sensitive areas and the guerrillas must control the surrounding area.

b. Hospital. The hospital provides for definitive treatment of casualties and coordinates medical resupply and training. The hospital may be a civilian hospital, or a collection of tents, caves, or ordinary houses. Caution should be taken to prevent the hospital from becoming so large that it attracts the enemy. As trained personnel, supplies, and equipment become available, additional hospitals are established, hospital wards are dispersed, and as soon as medically feasible, patients are transferred to a convalescent center. The hospital, with its immobile characteristics, should be situated a long distance from tactical units and target areas. The hospital should be well guarded and camouflaged. Guidelines for hospital organization and factors influencing the location of hospitals are:

(1) Operational-tactical factor. Areas in which frequent combat operations occur would not be ideal for a stationary hospital.

(2) Medical safety and security.

(3) Facilities for supply of medical essentials.

(4) Existence of settlements and individual buildings.

(5) Protection from enemy fire and defensibility.

(6) Camouflage.

(7) Access routes for supply and evacuation.

(8) Proximity to water.

c. Convalescent area. Convalescent patients should be discharged as soon as possible. A convalescent facility may be:

(1) A home in which one or two convalescents are recuperating, with cover stories as security.

(2) A camp in the hills organized along military lines.

(3) A winter sports recreational area. Locating casualties wearing casts in this area would arouse few suspicions.

G. Special Considerations:

1. Organization. The organization of the area medical service will depend upon the nature and attitudes of the people who participate in the medical net, and local area conditions and availability of medical supplies and personnel.

2. Background of potential supporters. The following biographical data should be obtained and evaluated on all indigenous personnel who are under consideration for participation in the medical organization of the operational area. It must be protected by a high level of security:

a. Nationality.

b. Date and place of birth.

c. Education and religion.

d. Knowledge of foreign languages and special skills or abilities.

e. Military background.

f. Travel background.

g. Political background, beliefs, and past activities in government.

h. Details on family.

i. Present job and salary.

j. Character and personality traits (loyalty, integrity, etc.).

3. Special considerations when making contact with indigenous personnel. Special Forces medics may be required to make initial contact with indigenous personnel outside the guerrilla unit in organizing medical net activities. The following information may serve as a guide:

a. Assistance may be obtained from sympathetic individuals or from members of the underground who already operate escape lines for the purpose of returning evaders to friendly lines. Medical personnel must use great caution when contacting natives, regardless of who or what they purport to be. Remember that persons wearing civilian clothing in enemy-held territory are not necessarily civilians.

b. It is advisable to avoid the young and the rich. Young people are usually thoroughly indoctrinated and the rich are often government officials. Initially, it is safer to contact individuals such as farmers, shepherds, lower clergy, independent shop keepers, and those disloyal to the government. Keep in mind that many of the higher clergy may have government sympathies. As a rule, indigenous women are unreliable contacts. However, should it become necessary to negotiate with women, be businesslike and courteous and terminate the dealings diplomatically, and as quickly as possible, in favor of a male contact.

c. Contact with indigenous personnel should not be made in a group, nor is it advisable to make contact in a village or town. Wait until the person to be contacted is alone, preferably in an isolated area, before approaching him. Indigenous personnel are not likely to trust one another in a totalitarian state unless they happen to be very close friends or are associated in resistance work. It may be that a sympathetic person may refuse to cooperate because of the presence of a third person, or from fear that your approach has been witnessed by another person. It is advisable to contact indigenous personnel around dusk, just after he arises in the morning, while he is working in his field, or while he is traveling along an isolated road.

d. Once you select a native whom you have evaluated through reliable sources and whom you believe to be sympathetic, be very cautious during the time of initial contact. The native may offer you his hospitality or he may tell you that you should wait while he goes to consult a friend. If the latter is the case, you should agree but move to a concealed area nearby so that you can observe the native as he comes back but not be observed yourself. If the native is seen returning with police or military authorities, you will have an opportunity to escape. If it appears that the native is sincere and has returned with another friend, you should consider returning with caution to the contact place for further negotiation. However, if possible, have someone else with you to remain concealed and to cover your approach.

4. Care and utilization of prisoner or war patients. Supervision of POWs normally is exercised by the area command. During guerrilla operations, the prisoners can be expected to require medical care so maximum use should be made of captured enemy medical personnel. The detachment medics should make an estimate of the bed and ration requirements and the number of POW personnel required for the care and treatment of other POWs based on the detachment commander's estimate of the expected number of POWs. Adequate security must be provided for all POWs receiving medical attention. Medical personnel should be alert for items of intelligence when treating POWs and

inform the detachment commander or intelligence NCO as soon as possible. Segregation should be considered when establishing a POW treatment facility so that security-conscious prisoners do not influence others to remain silent. Recommended groupings for segregation are officers, NCOs, privates, deserters, civilian government officials, political officers, and medical personnel.

H. Security Measures. The following security measures were successfully used during World War II by units involved in unconventional warfare operations:

1. Hospital wards were widely separated - up to five hours by foot.

2. Charcoal fires were used.

3. Knowledge of the overall medical organization was restricted to only a few individuals.

4. Timber was felled at least two hours by foot from the building site.

5. Patients were dispersed in danger areas.

6. Medical supplies not required for daily use was stored in hidden cache sites.

7. Well organized early warning systems were used.

8. Combat security was provided by specific units.

9. Previously prepared underground hide-outs for patients were used.

10. Evacuation drills:

a. Continuously up-dated current plans as to which patients could be evacuated, those who had to be hidden, and the type of transportation to be used for evacuation.

b. Staff briefed on revised plans weekly.

c. All new patients briefed as soon as possible.

d. Sufficient supplies packed in "go bags" at all times.

11. Sick and wounded were admitted only through secret contact points, the exact location of which were known only by certain evacuation personnel, commanders, and responsible medical officers.

12. Sick and wounded were admitted and discharged at night or transported blindfolded by day. The discharge net was different from the initial one.

13. Strict security was observed during transport of patients and when collecting food.

14. Access roads, trails, and hospitals were extensively camouflaged.

15. Code names were used for hospitals, villages, and landmarks.

16. Smoke from cooking was avoided during the day.

17. Noise was kept to a minimum during hospital construction.

18. All personnel were forbidden to leave the premises without permission.

19. Great care was taken in selection of reliable medical staff personnel and new patients were not admitted during uncertain situations.

20. Less serious cases were widely dispersed in small groups.

21. Absolute silence was maintained during the day (patients were encouraged to sleep during the day).

22. Paths leading to the hospital were changed often to avoid making visible trails.

23. On sunny days windows were covered to avoid reflecting sunlight.

24. Outpatient treatment was restricted to clinics far-removed from hospital sites and only patients needing in-patient care were admitted to the hospital.

25. Hospitals maintained close contact with nearest tactical unit to receive current information on the tactical situation and to provide protection during evacuation of patients.

26. Severe punishment was the rule for any violation of rigid discipline.

27. The same hideout was never used twice (breach of this principle caused 800 deaths in an area during one German offensive).

I. Expansion of Medical Service. As the insurgents consolidate their hold on the UWOA, all functions including medical support will tend to consolidate. Safe areas will permit the establishment of a centralized system of medical care. Sophisticated hospitals permit more elaborate care because they provide a wider selection of trained personnel, specialized equipment, and the capability of extensive and prolonged treatment. (Thus allowing smaller mobile hospitals to concentrate on acute, emergency treatment and evacuate patients who require long hospitalization.) Since this type of installation will be cumbersome, its mobility will be reduced, and it loses its clandestine characteristics. Therefore, it should be located in a relatively isolated area away from targets, troop units, headquarters, and supply dumps but where it can still receive protection from guerrilla forces. Depending upon circumstances and requirements, additional US medical personnel including physicians may be infiltrated into the UWOA. They may perform a particular mission and then be exfiltrated or remain in the area on a permanent basis.

J. UWOA Medical Training. All medical training of indigenous personnel is the responsibility of the detachment medics. Plans for medical training are formulated prior to deployment and are modified in accordance with needs and availability of trained or trainable guerrilla personnel. Maximum use should be made of all available medical facilities and trained indigenous medical personnel in training additional personnel. The amount and quality of the training depends on the situation, facilities, and teaching personnel. The ultimate success of the program, however, is determined solely by the ability of the Special Forces Medic.

K. Demobilization. During demobilization the detachment medics provide information and technical advice concerning:

1. Medical records. All records should be completed or certificates prepared in lieu of records that have been lost or destroyed.

2. Settlement of pay, allowances, and benefits for all indigenous medical and paramedical personnel.

3. Settlement of claims. It is advisable to perform complete physical examinations on all guerrilla personnel being demobilized to minimize future fraudulent claims against the government.

4. Supplies and equipment. All supplies and equipment are inventoried and accountability established before the settlement of pay, allowances, and benefits. The manner of disposition of supplies and equipment is determined by the detachment commander or by higher headquarters.

5. Hospitals. Guerrilla hospitals are kept in operation until the patients can be handled by military or civilian hospitals. Every effort is made to insure that patients receive continuous care during the demobilization phase. Permanently disabled guerrillas may be granted pensions by the recognized government.

6. Awards and decorations. The insurgent policies covering awards and decorations also apply to guerrilla medical personnel. Deserving medical personnel should be recommended for decorations.

L. Conclusions. The quality of the Special Forces medical program will have a most important and direct bearing on the success of the entire Special Forces mission. The success of the Special Forces medical program depends largely on the background, knowledge and ingenuity of the detachment medic, and the support of the detachment commander.

V. PREVENTIVE MEDICINE.

A. Role of the Medic. Although a trained Preventive Medicine Specialist is found at the "C" detachment level in the Special Forces Company Medical Operations Section, the responsibility for the execution of preventive medicine programs at the "A" and "B" detachment level lies with the detachment medics. Overall responsibility for the implementation of preventive medicine measures lies with the detachment commander. The medic must aid the commander in protecting the health of his unit and maintaining a healthful environment. The medic must advise and recommend preventive medicine measures to the detachment commander, plan preventive medicine programs, and perform in a supervisory or working role to carry out these programs.

B. Specific Responsibilities. Many factors will alter the extent of involvement of the medic in preventive medicine. These include the existence of trained preventive medicine specialists, the overall sanitary conditions, and the basic treatment workload. It should be strongly emphasized that the basic role of the medic should be teaching and supervision of preventive medicine measures rather than personally carrying them out.

1. Basic sanitation:

a. Waste disposal:

(1) Human waste. Latrines must be constructed to prevent the contamination of food and water. They should be located at least 100 yards from the unit mess and from any unit water source and at least 30 yards from the border of the unit area.

(2) Liquid waste. Liquid wastes accumulate at the rate of one to five gallons per man per day. Liquid waste is disposed of in the soil by means of a soakage pit or trench which must have a grease trap to prevent clogging. (See Appendices 9 through 18.)

b. Mess sanitation. (See Appendix 19.) 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. The following are useful guidelines to insure proper food handling:

(1) Transportation. Vehicles used for transporting food must be clean and completely enclosed.

(2) Storage. Perishable food products are stocked at a realistic operating level. They should be refrigerated at 45° or below. Vegetables such as potatoes and onions are stored in a dry place on dunnage so air can circulate around them. Acid foods such as citrus fruit drinks must never be stored or served in galvanized iron cans.

(3) Preparation. Eliminate any unnecessary lapse of time between the preparation and the serving of the meal. In moderately hot climates three hours are considered to be the safe limit for uncooked protein foods to remain unrefrigerated. When defrosted or dehydrated foods are exposed to moisture, they are particularly susceptible to spoilage. Dehydrated foods are used at once after reconstitution. One exception is reconstituted dehydrated milk which may be kept under good refrigeration overnight to improve the flavor and solubility of the product. After frozen foods are defrosted, they should be used promptly and never be refrozen. All fruits and vegetables are washed before use to eliminate spray residues and contamination. Use a chlorine solution of 75-100 ppm in warm water for washing, then immerse for 30 minutes in a chlorine solution of 75-100 ppm available chlorine and rinse with potable water. When clear water is used, one package of "Disinfectant, chlorine, food service FSN 6840-270-8172, dissolved in ten gallons of water provides 75-100 ppm. One plastic canteen cap filled with chlorox or eight metal canteen caps full in five gallons of water provides roughly 75-100 ppm. Double the disinfectant or chlorox for turbid water.

2. Personal hygiene and protective measures. Hand washing devices should be provided outside latrine enclosures and the unit mess. All washing and showering devices should have a soakage pit underneath them to prevent water from collecting and forming pools. All personnel should be briefed on foot care. Guidance should be provided in the use of protective measures to avoid heat and cold injuries, snake bite, and sunburn.

3. Procurement and treatment of water:

a. Procurement. The quantity of water needed for field troops varies with the season, area, and the tactical situation. A guide for planning to meet the total water requirements in a temperate zone is five gallons per man per day unless showering facilities are to be made available. In this case the requirement should be increased to 15 gallons. These amounts should be adjusted upwards for tropical zones. Wells are the best source for water and they usually require the least amount of purification. The well should be cased and covered to prevent contamination from surface runoff. Surface sources such as lakes and streams are usually the most contaminated and require the most treatment, but are the easiest to obtain. The quality of rainwater is excellent, but quantity is not dependable as a primary source.

b. Treatment:

(1) Field treatment includes coagulation and sedimentation to remove turbidity, filtration to remove the remaining turbidity and a large portion of the pathogenic organisms, and disinfection to kill any pathogenic organisms which have not been removed by sedimentation and filtration.

(2) A device sometimes seen in Special Forces is the Water Purification Unit, Hand Operated, Knapsack Pack, Filter Pad Type, 1/4 GPM, FSN 4610-256-4198. Replacement pads: Filter pads, FSN 3898-500-0550. This unit is issued one to an operational detachment and will filter all suspended particles from water. Clear water is produced, but is not purified. The water must be disinfected after filtration.

(3) Disinfection methods:

(a) Iodine tablets, FSN 6850-985-7166 is the most available and easiest method for individual troops. One tablet added to a canteen (1 quart) releases 8 ppm of iodine. Two tablets are used for turbid water. A fifteen minute contact period is usually sufficient (if the water is cold allow 30 minutes). There is no method to test iodine residual in the field. CAUTION: The shelf-life of iodine tablets is 2-5 years. Deterioration is evidenced by a change in tablet color, metallic gray is acceptable (8 mg available iodine); light yellow-double the dose (4 mg available iodine), and reddish brown-discard (no available iodine). The formation of a precipitate with most waters is harmless and acceptable. The formation of a blue color occurs when iodine interacts with starch (potatoes, corn, rice, etc.). The blue colored water is harmless and acceptable for drinking. Taping the iodine tablet bottle to the canteen top serves as a good reminder to use the tablets for each new canteen of water.

(b) Calcium Hypochlorite (ampules), FSN 6850-270-6225. This is the most satisfactory and convenient method for disinfecting water in the 36 gallon Lyster bag. One ampule contains 0.5 gm of calcium hypochlorite and ordinarily gives about 2 ppm of chlorine. (Do not use the old 13 mg ampules.) Remember to allow ten minutes contact time before testing for chlorine residual. (Chlorine residual is active chlorine remaining in the water, available for further oxidation of harmful impurities should they still be present or be spilled into the Lyster bag.) After additional chlorine has been added, a 30 minute contact period must be allowed before the water may be consumed (see Appendix 20).

(c) Calcium hypochlorite to treat small amounts of water: Mix a stock solution of one ampule to 1/2 canteen of water. Add one metal canteen capfull of the stock solution to each canteen of water to be purified. Add two or more capfulls for turbid water. A 30 minute contact time is allowed before drinking.

(d) Chlorox. Ordinary household Chlorox can be used as follows: Four drops per quart (canteen) gives 10 ppm in clear water. This amount should be increased to eight drops for turbid water and 16 drops per gallon gives 10 ppm in clear water (double for turbid water).

(e) Boiling. Boiling may be used when none of the above methods are available. A hard, rolling boil for 60 seconds is sufficient.

(4) Chlorine residual determination. Use the field test kit containing a plastic holder and a bottle of orthotolidine tablets. The yellow band on the plastic bottle indicates the color of a residual of 5 ppm. This kit is issued with the calcium hypochlorite ampules. Color bands will fade if exposed to sunlight so keep covered when not in use and discard when box is used up. The newer units have three bottles (1-5-10 ppm).

4. Food procurement and inspection.

5. Arthropod and rodent control:

a. Rodent control. The key to rodent control is good area police. There are many sophisticated programs that can be instituted but if insects and rodents are denied a place to live and breed through a good clean-up campaign, a good start has been made in eliminating the problem. Ditches and depressions should be kept free of standing water. Do not allow garbage to remain unburied since it will attract flies and rats. Rats should be live-trapped and burned to kill fleas and mites that they may have in their fur.

b. Arthropod control. An effective program for the prevention of arthropod-borne diseases should consist primarily of sanitation measures but includes the use of personal protective measures and the application of pesticides. Fundamental to the operation of an effective program are a basic understanding of the life cycles of medically important arthropods and a knowledge of where they can be found. The following chart will serve as a reference.

Medically Important Arthropods	Approximate Duration of Life Cycles at 75°C	Where found
Flies (Example: housefly)	Egg---------10 hours larva------- 5 days pupa-------- 5 days adult-------30 days	Animals or human waste, garbage, grass, decomposing animals, and mud contaminated with organic material.
Mosquitoes (Example: yellow fever mosquito)	Egg--------- 4 days larva-------10 days pupa-------- 2 days adult-------14 days	Standing water which may be found in ponds, tin cans, old tires and tree holes. (A large variety of places and conditions of breeding have been noted.)
Fleas (Example: oriental rat flea)	Egg--------- 7 days larva-------15 days pupa-------- 8 days adult------365 days	Nests or beds of animals.
Lice (Example: human body louse)	Egg--------- 7 days nymph-------16 days adult-------30 days	Head hair and clothing of humans. Lice cannot exist on a clean human
Cockroaches (Example: German cockroach)	Egg---------30 days nymph-------60 days adult------200 days	Cracks and crevices which provide warmth, moisture, and food such as around water, garbage, and food facilities.
Ticks and mites	Life cycle completed 6 weeks to 2 years	Tall grass, underbrush, animal watering places, and shady rest areas of animals.

Delousing Measures

Ten percent DDT in talcum is very effective in all forms of pediculosis. Shaving the head is unnecessary when using DDT.

Head Lice (Pediculus capitis). Dust 2.5 to 5 Gm of 10% DDT powder into hair and distribute well over scalp. Do not wash hair for one week. Repeat treatment at least once at end of two weeks.

Body Lice (Pediculus corporis). Remove all clothing and autoclave or steam thoroughly. Dust 5 to 10 Gm of 10% DDT powder evenly over body surface, especially hairy areas, or use spray of 6% DDT in benzyl benzoate diluted with four to five parts of water. Twenty-four hours after treatment, wash well with soap and water and repeat application of DDT several times.

Pubic Lice (Pediculus pubis, "Crabs"). Dust DDT powder locally, distribute evenly, and allow to remain for two to three days. Wash off with soap and water and repeat treatment at least once. Kwell® cream (gamma benzene hexachloride) is an effective new drug. It should be applied liberally after thorough cleansing of the affected areas. Repeated application is rarely necessary, but in stubborn cases the treatment may be repeated after four days.

c. Individual protective measures:

(1) Clothing. The combat uniform worn loosely with the pants tucked into the boots and with the sleeves down and buttoned provides good protection against mites and ticks.

(2) Clothing repellent miticide, (M 1960) (DEET). The uniform impregnated with M 1960 provides additional protection against arthropods. This chemical will kill mites and ticks and repel mosquitos and other arthropods. Using a long stick and a 15 to 20 gallon container, mix one gallon of M 1960 with 11 gallons of water. Be sure the ratio is correct. Pour 3-1/2 pints of the prepared solution into a helmet. Fold and compress the clothing, one set at a time, into the solution, insuring that they become evenly and completely wet. Wring the solution from the clothing and dry on a clean flat surface. DO NOT impregnate underclothing or socks. In extremely hot climates, much sweating often causes severe skin irritation. In this case, regular insect repellent may be used on the exposed areas of skin.

(3) Insect repellent. Insect repellent applied to the exposed skin provides good protection against almost all arthropods including leeches (it is also flammable and good for starting fires).

(4) Sulfur powder, if dusted through the clothing, provides excellent protection against chiggers.

(5) Insecticide dispenser (aerosol) is highly effective against flying insects.

(6) Kerosene or insect repellent applied to the neck, wrists, and legs at the boot tops help prevent insects such as chiggers from infesting the body.

After exposure to chiggers and lice, a bath using strong laundry soap will rid the individual of most of these insects (provided a change of clothing is available).

d. Chemical control. Pesticides are valuable aids in the control of arthropods, but they are used to augment, not replace, field sanitation and individual protective measures. Pesticides are poisonous. Kerosene or fuel oil is used as a solvent for most pesticides, and these can be absorbed through the intact skin. The pesticide is absorbed with the solvent. Pesticides also produce a toxic vapor and a respirator or gas mask should be worn for indoor spraying.

(1) Classification of pesticides. Stomach poisons, such as lead arsenate, must be eaten by the insect. Contact poisons, such as DDT, lindane, pyrethrum, and diazinone, kill by merely coming in contact with the insect. Fumigants kill through the respiratory system. Because of their danger to humans they are not normally used.

(2) Toxicity. Insure that the directions are followed for the use of any pesticide. Any pesticide marked "concentrate" MUST NOT BE USED. Concentrates are deadly poisons and can only be used by specially trained personnel. Check with your preventive medicine specialist prior to using any item with which you are not familiar.

e. Equipment available for issue. Two items are available in normal supply channels for applying pesticides. The hand duster is used with 10% DDT dust for delousing purposes and the hand pressure sprayer is used for liquid pesticides. See Appendix 21 for a list of pesticides, insect and rodent control equipment, and water purification supplies available for issue.

6. Immunization program. The types of immunizations utilized will depend upon the spectrum of diseases prevalent in the operational area. Needs can be forecast from the area medical study. An immunization schedule guide is found in Appendix 22. As a rule, the population of underdeveloped areas will not have been exposed to vaccines previously and a low rate of allergic reactions can be anticipated. However, this low risk does not preclude administering immunizations in the vicinity of a medical treatment facility if possible and maintaining the capability to treat allergic reactions. (See Appendices 23 and 24 for shock tray components and emergency treatment methods.)

7. Physical fitness evaluation of indigenous forces. Initial physical exams should be done on all guerrilla personnel. They should be classified according to physical fitness standards. Recommended categories include fitness for combat, support units, administrative duties, and unfit for military duty.

Criteria for each category should be established by the most highly qualified medical person available in coordination with the area command staff. The importance of this classification system should be fully understood by the detachment commander and the Area Command.

XI. GARRISON DUTIES AND POLICIES (AN EXAMPLE).

A. Medical Support. The following guidelines are based upon policies of one of the active Army Special Forces Groups and regulations applying to the John F. Kennedy Center for Special Warfare. This section is offered as an example which has proven to be satisfactory in actual experience.

1. Requests. All requests for lettered line company medical support, with or without ambulance, will be coordinated through the respective SFCOMEDOPSEC. HHC and SAF units will coordinate with the Medical Detachment Headquarters. Medical support will be furnished by the unit responsible for the activity when that unit has organic medical personnel.

2. Reporting. The medic with ambulance will report to the OIC 30 minutes prior to the appointed time. In the absence of instructions the medic will post himself in position to observe the jumpers or firers. This will normally be in the vicinity of the "T" turn-in point or base of range tower.

a. Requirements. The following is a minimal list of medical supplies and equipment to be on hand. Quantities will be determined by the magnitude of the operations.

(1) Truck, ambulance with OVE.

(2) Litters (3).

(3) Blanket set, complete.

(4) Splint set, complete.

(5) Morphine, syrette, 1/4 grain, one packet 5's.

(6) Dressing, first aid.

(7) Dextran solution and IV administration set.

(8) Water can with water.

It is the medic's responsibility to make arrangements with Group Medical Supply for issue and turn in of support equipment. Under no circumstances will support equipment or narcotics be kept in the possession of the medic upon return to the cantonment area nor will equipment be left unattended. If a Group Medical Supply representative is not available upon return, and

cannot be located or contacted, equipment will be turned in to the unit CQ for security. The medic is responsible for returning to the CQ the following morning to reclaim his equipment and turn it in to Group Medical Supply. It is the responsibility of the medic and driver to insure that the ambulance is cleaned upon return to the Group Motor Pool. If late at night, the ambulance will be cleaned the following day.

b. Injury reports:

(1) All injuries, other than minor cuts, abrasions, and lacerations will be recorded and immediately reported to the OIC with an information copy to the surgeon as soon as possible.

(2) All injuries requiring evacuation for further treatment will be tagged (field Medical Card, DD Form 1380), and the carbon turned over to the OIC and forwarded to the Surgeon. Emergency treatment takes priority over filling out tags. The following information is the minimum acceptable:

(a) Name, rank, service number, and unit.

(b) Description of injury.

(c) History of injury: how, when, where, and why.

(d) Treatment.

(e) Disposition.

(3) In the event of an injury resulting in hospitalization or fatality, the senior AMEDD representative on the drop zone or range will submit a report by phone to Group HQ and to the Group Surgeon as expeditiously as possible.

c. Jump refusals. A physician will conduct a thorough examination of all jump refusals and submit a report to Group HQ within 12 hours of the refusal. This report will include the physician's statement about the physical and mental condition of the patient and whether or not the jump refusal was due to a medical condition.

d. Emergency evacuation procedures:

(1) Ambulance or helicopter evacuation is available on-call.

(2) Emergency requests may be made under the following conditions:

(a) Ambulance. If the unit ambulance breaks down with patients who require immediate evacuation and the unit cannot send a replacement vehicle.

(b) Helicopter. If a patient's life, limb, or vision is in jeopardy.

(3) Requests for emergency evacuation at Fort Bragg will be made by having the OIC call Range Control and give the following information:

(a) Number and diagnosis of patients.

(b) Location of desired landing site (grid coordinates, prominent terrain features, etc.).

(c) Weather conditions and hazards to navigation (wires, towers, trees, etc.).

(d) Special equipment and supplies required (blood expanders, splints, oxygen, etc.).

(e) Means used to identify landing zone.

(f) Name, grade, telephone number, and organization of person requesting the evacuation.

B. Immunizations:

1. Responsibilities. The unit commander is responsible to insure that all personnel assigned or attached receive required immunizations. The Unit Personnel Officer is responsible to suspense immunizations and to provide a roster of personnel requiring immunization to the unit commander on a monthly basis. The Group Medical Section is responsible for administering required immunizations, the accuracy of individual immunization records, and proper authentication of the entries.

2. Mandatory precautions. Before administering any immunization, be sure that a physician is and will be physically available in the immediate vicinity. Take a careful history including personal and family history of any allergy or drug sensitivity, previous use of the agent and any untoward effects, and persons with significant allergy to egg or chicken should under no circumstances be given vaccine prepared by cultivation in eggs (influenza, typhus, yellow fever). The initial injection should be given either in the upper

arm or lateral surface of the thigh at the point distal enough to permit application of a constricting band should an immediate reaction occur. The patient should be kept under direct visual observation for a minimum of 15 minutes following the first injection of any new series. Only approved items will be administered (see current list of drugs that have been suspended from issue).

3. Emergency measures for the management of anaphylaxis should be conspicuously posted in the treatment room. There is a wide variation in the manifestations of anaphylaxis and degree and duration of supporting measures will vary accordingly. Shock may recur or persist over a period of hours and supportive therapy may be required for as long as 24 hours.

4. Recording of reactions. Immediate and delayed reactions must be recognized and documented. It is the responsibility of the physician to record all drug reactions in each of the following records:

a. DD Form 722 (Health Record Jacket). A bold, block letter entry in red ink will be made on the cover of DD Form 722 as follows: "Reaction to (amount) of (antigen) which was (severity)", plus the signature of the physician.

b. DD Form 722-1 (Dental Health Record Jacket).

c. SF 601 (Immunization Record).

d. PHS Form 731 (International Certificate of Vaccination).

5. Reporting of reactions. Anaphylactic reactions to immunizing agents will be reported IMMEDIATELY, by telephone, to the Surgeon, USAJFKCENSPWAR. A complete narrative summary of each case will be forwarded within three days. The initial telephone information will include:

a. Name, rank, and service number of the individual sustaining the reaction.

b. Clinical description of the reaction.

c. Type, manufacturer, lot number, and date of manufacture of the vaccine or medication.

d. Whether the immunization was primary or booster.

6. Posting of records:

a. SF 601 (Immunization Record) will be filed in the Individual Health Record and will be maintained in the unit medical treatment facility. Entries will be posted at the time the immunization is administered or as soon as possible thereafter if the record is not available at the time. All entries on SF 601 will be made signed in black ink, entered with a rubber stamp, or type-written with authentication made by initialing.

b. PHS Form 731 (International Certificate of Vaccination) will be used for service members, civilian personnel, and dependents. Entries will be made by the Unit Personnel Officer upon notification from the immunizing facility. All entries will be authenticated by the full signature of the physician and by affixing the Department of Defense Immunization Stamp. Immunization with gamma globulin will be recorded as prescribed for other immunizations. The PPD tuberculin and other skin tests including results will be recorded under "Sensitivity Tests".

c. All records should reflect the highest standards of legibility, serviceability, and accuracy. Personnel who have failed to complete their initial series and are overdue for the next booster do not require initiation of a new series.

C. Medical Equipment. The medics are required to have a thorough knowledge of all medical equipment and supplies issued and used by the detachment and are responsible to insure that medical equipment is maintained in a high, constant state of readiness. The medical TO&E of detachments "A" and "B" may be stored by the supporting SFCOMEDOPSEC. This does not relieve the detachment medics of maintenance responsibility.

1. The following TO&E is restricted to use on missions and mobile training teams or as directed by Group HQ. It will not be used for normal training or field exercises.

a. Surgical Instrument and Supply Set, Combat, FSN 6545-927-4200.

b. Dental Instrument and Supply Set, Emergency Treatment, FSN 6545-927-4840.

2. The following equipment will be utilized for field exercises and may be drawn from Group Medical Supply.

a. Case, Medical Instrument and Supply Set, Non-rigid, Nr 5, Empty, FSN 6545-912-9890.

b. Case, Medical Instrument and Supply Set, Non-rigid, Nr 3, Empty, FSN 6545-912-9870.

3. Requests for medical equipment and supplies. Units requiring medical equipment and supplies for training or field exercises will request items on DA Form 2496 (Disposition Form) to include nomenclature, unit of issue, amounts, name of problem and area, and length of stay. All requests will be routed through the S3 to Group Medical Supply not later than seven days prior to anticipated need.

4. Special projects, missions, and mobile training teams. The senior medical specialist will be designated to act as liaison with Group Medical Supply by the detachment responsible for the project. All requests will be turned in to the senior medical specialist who in turn will consolidate and forward the requests to Group Medical Supply. Requests will be routed through the AST, S3, and S4 for approval prior to action by Group Medical Supply. Request must be firmed-up and staffed as soon as possible to insure that non-standard items are received in time to accompany the detachment. Time lag for non-standard items is generally 3-4 weeks.

5. Requests for routine coverage. Requests will be made directly to Group Medical Supply by the medic covering the exercise, at least 24 hours prior to anticipated use.

6. Authorization to draw narcotic and controlled items. Upon assignment to an operational detachment, each medical specialist will initiate a DD Form 577 (Signature Card) authenticated by the unit commander or his S4 authorizing the medic to receive narcotics and controlled items. This card will be kept on file by Group Medical Supply to insure that only authorized personnel receive narcotics and controlled items. It will be destroyed upon departure of the medic to whom it was issued.

I. ABDOMINAL CONDITIONS.

A. General. If bowel sounds are abnormal, absent, or the abdomen is rigid, it is a surgical abdomen.

B. Localization of Pain:

1. Right upper quadrant. If dull and steady, consider hepatitis; if colicky, consider gall bladder disease.

2. Right lower quadrant. Rule: tenderness in RLQ (with or without pain) in an otherwise healthy adult is appendicitis until proven otherwise. In female also consider salpingitis, PID, and ovulation pain.

3. Left upper quadrant. Pain is rarely of surgical nature. Consider enlarged spleen from parasites or infection.

4. Left lower quadrant. An uncommon site for pain of surgical nature, but consider diverticulitis in old patient and PID or ovulation in female.

5. Periumbilical. Usually indicates disease of small bowel or early appendicitis.

6. From flank across abdomen to groin. Renal stone.

7. Low abdominal or generalized abdominal. Typical of distended large bowel.

8. Epigastric pain. Peptic ulcer, gastritis, pancreatitis, or gastroenteritis.

C. Signs and Symptoms:

1. Pain. If the GI tract is involved in a surgical problem, pain (usually of cramping nature) is almost always present.

2. Vomiting:

a. Ulcer. If vomiting is bloody, ulcer very likely.

b. Bowel obstruction. Vomiting associated with pain seen early in small bowel obstruction, later in large bowel obstruction. Vomiting may give temporary relief.

c. Pancreatitis. Always.

d. Peritonitis. Always early but stops as peritonitis advances.

e. Gastritis. Often.

f. Appendicitis. Sometimes.

g. PID. Sometimes.

h. Gall bladder disease. Usually.

3. Fever. Usually elevated in surgical diseases of abdomen but may be below normal in pancreatitis or early perforated ulcer.

4. Leucocytosis. If leucocytosis is present and there is a "left shift", consider infection (e.g. appendicitis or infected gall bladder) as the cause of pain.

D. Management of Surgical Abdominal Conditions While Awaiting Evacuation:

1. Nothing orally (may moisten the lips).

2. Naso-gastric tube. Necessary in patient with vomiting, GS wound of abdomen, bowel obstruction, and an ulcer which is bleeding or perforated. The NG tube removes blood or gastric juices which continue to be secreted and flow to the diseased area and increases the damage.

3. IV. Daily requirements plus loss by vomiting. If appendicitis or other "itis", add 10-20 million units of penicillin per day (or other antibiotic if available).

4. Catheter. Catheterize if unable to urinate. Measure urine output.

5. Pain medication. Intra-muscularly if evacuation is not immediately available (MS or demerol in cases where you are not worried about obscuring the symptoms).

6. Bed rest.

E. Common Abdominal Diseases:

1. Duodenal ulcer. Hemorrhage from peptic ulcer ranges from mild chronic to massive acute. The sudden onset of weakness, dizziness, thirst, cold moist skin, desire to defecate, and the passage of loose tarry or even red stools with or without coffee ground vomitus is characteristic of acute gastrointestinal hemorrhage. The hematocrit may remain falsely high for several hours. Treatment should be immediate.

a. Absolute bed rest; sedation with one-half to one grain phenobarbital or codeine 30-65mg; do not use morphine except as a last resort.

b. Monitor vital signs every 30 minutes and hematocrit every two hours.

c. NPO initially.

d. Pass a nasogastric tube and withdraw blood from stomach. Irrigate stomach with 50-100cc saline at a time until suction from stomach is reasonably clear. This irrigation is not absolutely necessary and can be foregone if saline is not available. Do not use D5W as an alternate irrigating fluid.

e. Transfuse if:

(1) Patient has signs and symptoms of shock. A difference of 20 mm. Hg in B.P. between sitting and supine position indicates impending shock.

(2) More than 500cc of blood is withdrawn from the stomach.

(3) Hematocrit is 30 or less.

f. Feed milk and antacid either alternately.or solely every one-half to one hour as soon as patient stabilizes. Progress to bland diet with frequent small portions as conditions permit.

g. Evacuate ASAP.

2. Obstruction in peptic ulcer disease presents post-prandial epigastric fullness and copious vomiting of undigested food from a previous meal. It is usually due to pyloric spasm or edema and can usually be treated by one to two days of NG suction and IV's followed by fluid diet and progression to more normal diet over a period of days. Anticholinergics should not be used with an ulcer patient who has symptoms or obstruction.

3. Intestinal obstruction and paralytic ileus.

a. Signs and symptoms:

(1) Colicky abdominal pain, fecal vomiting, constipation, progressive shock, tender distended abdomen without peritoneal irritation, i.e., no rebound audible high-pitched, tinkling bowel sounds early; late, silent.

(2) Acute mechanical intestinal obstruction usually involves the small intestine, particularly the ileum; major causes are hernia and adhesions.

b. Treatment. Fluid balance must be restored and maintained. The stomach should be decompressed with a Levin tube. The patient must be constantly observed and surgical correction undertaken at the first opportunity. Failure to respond to conservative therapy by passage of flatus and decrease in symptoms is an indication for immediate evacuation.

4. Appendicitis:

a. Signs and symptoms. Right lower quadrant abdominal pain and tenderness with signs of peritoneal irritation, anorexia, nausea, vomiting, constipation, and leukocytosis.

b. Complications of appendicitis. Ruptured appendix, perforation seldom occurs within the first 8-12 hours. Signs include increasing temperature and severity of pain although a transient episode of pain relief may occur when appendix ruptures; tenderness and spasm in the right lower quadrant followed by evidence of generalized peritonitis.

c. Treatment. Medical management as an intestinal obstruction including antibiotics. Evacuate.

5. Cholecystitis:

a. Signs and symptoms. Nausea, vomiting, colicky right upper quadrant, pain referred to right scapula, tenderness, fever, leukocytosis, and usually a history of previous attacks.

b. Treatment. Analgesics IM (preferably MS or demerol), bed rest in semi-sitting position, nasogastric tube to drainage or suction, NPO, fluid and electrolytes IV, penicillin 10-20 million units per day, streptomycin 1gm per day, and atropine (gr 1/150) IM or probanthine 15mg IM if available.

6. Peritonitis:

a. Etiology. Perforated gall bladder, ruptured appendix, perforated ulcer, pancreatitis, or open abdominal wound.

b. Signs and symptoms. Abdominal pain, vomiting, fever, and prostration; signs include abdominal rigidity, followed by abdominal distention and paralytic ileus, leukocytosis, absent bowel sounds, and shock may follow.

c. Treatment. As in intestinal obstruction plus antibiotics.

7. Pancreatitis:

a. Signs and symptoms. Abrupt onset of steady epigastric pain, often with back radiation, nausea, vomiting, prostration, shock, sweating, abdominal tenderness and distention, fever, leukocytosis, and elevated serum amylase and lipase. There is usually a history of alcohol excesses.

b. Treatment. Bed rest, morphine sulfate, 10-15mg subcut, atropine sulfate, 0.4 to 0.6mg. Treat as intestinal obstruction.

E. The Female of Childbearing Age with Abdominal Pain:

1. PID (Pelvic inflammatory disease):

a. Signs and symptoms. Low, steady abdominal pain; usually sudden onset; frequently associated with menstrual period; fever; vaginal discharge; leucocytosis; painful; frequent urination; and tender cervix.

b. Treatment. Medically as appendicitis (see general treatment); liberal use of antibiotics, preferably penicillin. Gram stain any vaginal or cervical discharge for Gonococci.

2. Ruptured ectopic pregnancy:

a. Definition. A pregnancy in the Fallopian tube that expands for one to three months then ruptures causing intra-abdominal hemorrhage.

b. Signs and symptoms. One or more missed periods, sudden onset of low abdominal pain, rapid pulse, palor, vaginal bleeding, vomiting, nausea, abdominal distention, and ileus. May progress to severe shock and death.

c. Treatment. Primarily surgical but while awaiting surgery patient must be treated for shock. Evacuate as soon as possible.

3. Ovulation pain. Pain in either lower quadrant occurring halfway between menses. There is no spasm, guarding, fever, or signs of internal hemorrhage. Treatment is supportive using analgesics.

II. VASCULAR DISEASE.

A. Introduction. Trauma to the arteries is common and generally quite obvious. Injury to major arteries will very likely require skilled surgical treatment, and this treatment must generally be accomplished in a matter of a few hours to be of benefit.

B. Thrombophlebitis:

1. Definition. Thrombosis of veins secondary to inflammation of the wall of the vein.

2. Etiology. Thrombophlebitis often occurs secondary to infection (e.g. cellulitis), long term illness, bed ridden state, and trauma. It is a complication of some surgical procedures and usually occurs between the fifth and fifteenth post-operative day.

3. Signs, symptoms, and locations. May occur in any vein but usually is seen in calf veins. Pain is the usual presenting complaint, and the involved extremity may be edematous. Pain on dorsiflexion of the foot may be present (positive HOMAN'S sign).

4. Complications, pulmonary embolus. Any bedridden patient or any patient with cellulitis of the feet who complains of chest pain and has cough, tachycardia, dyspnea, and anxiety for unexplained reasons should be suspected of having pulmonary embolus.

5. Treatment:

a. Early ambulation and vigorous treatment of infections are preventive measures.

b. Elevation of the legs. Do not use pillows under calves to elevate legs.

c. Wet warm compresses.

d. Wrap the legs snugly in elastic bandage (ace bandage) to the thigh.

e. Gentle passive and active exercise with graduated ambulation as the symptoms subside. The patient should walk slowly and not sit or stand for any length of time.

f. Extensive and marked thrombophlebitis will have to be treated in a hospital by anti-coagulation and possibly by surgery.

C. Lymphangitis:

1. Signs and symptoms:

a. Vague red lines or streaks often extending upward from an area of infection, particularly from an area of cellulitis or from an abscess.

b. Lymphodenopathy. Enlarged lymph nodes are usually found above the area of lymphangitis.

c. The red streaks are not palpable in lymphangitis, but are palpable in superficial thrombophlebitis.

2. Treatment. Procaine penicillin 1.2 million units b.i.d. and immobilization of area.

D. Arterial Diseases (Arteriosclerosis):

1. History:

a. Cool, pale extremities.

b. Pain in the legs on walking which is relieved by stopping to rest.

c. Possibly skin ulcers.

2. Physical examination:

a. Skin cool to touch.

b. Skin dry, loss of hair.

c. Absence of peripheral pulse.

3. Treatment:

a. Prevent trauma.

b. Clean socks, good fitting shoes.

c. Keep feet warm, dry.

d. Strict attention to nail care.

e. Rub feet daily with lanolin or similar lotion.

III. DEFICIENCY DISEASES.

A. Fat Soluble Vitamins:

1. Vitamin A. Necessary for production of visual purple of the retina, new epithelial growth, and resistance to infections.

a. Deficiency results in:

(1) Night blindness which can progress to color blindness in daylight.

(2) Keratitis.

(3) Skin dry and rough (toad like). Hazy inflamed cornea.

(4) Dull conjunctiva and thickened hardened eyelids.

b. Treatment. Vegetables and fruits, e.g., corn, squash, carrots, yellow vegetables, liver, cod liver oil, butter and eggs. Vitamin supplements (children: 20-50,000 units per day and adults: 50-100,000 units per day).

2. Vitamin D:

a. Deficiency. Children develop rickets manifested by enlarged joints, malformed teeth, square head, rachitic rosary, mis-shapen skeletal frame, bowlegs, and hunched back appearance.

b. Treatment. Vitamin D: 10-50,000 units per day for seven days, then 2,500 units per day for eight months, along with diet of egg yolk, butter, fish oils, and yeast.

c. Deficiency in adults results in Osteomalacia. Manifested by skeletal deformities, narrow pelvis, vague bone and joint pain, joint enlagement, restlessness, and malaise.

d. Treatment. Vitamin D: 50,000 units per day for extended periods, sometimes years.

B. Water Soluble Vitamins:

1. Vitamin B_1 (Thiamin):

a. Deficiency results in Beri-Beri. Dry Beri-Beri can be moderate or chronic degeneration of the nervous system, the signs and symptoms of which include stabbing pains while walking, tingling sensation in the extremities, muscle tenderness and weakness leading to atrophy, eventual decrease in patellar and achilles tendon reflexes, anesthetic or hyper-sensitive areas, and coldness of the feet. Wet Beri-Beri is manifested by progressive edema, mainly of the lower extremities. There is also a gradual onset of loss of motion and sensation in the feet and hands, cold skin, an ascending type of paralysis, spasms, tremors, and palsy. The condition leads to congestive heart failure.

b. Treatment. Children 5-10mg Thiamine q.i.d. for four weeks. Infants 2mg t.i.d. for three to four weeks in saline. Adults 40-50mg Thiamine daiy till asymptomatic.

2. Niacin:

a. Deficiency results in Pellagra. Diarrhea, dermatitis, and dementia are the hallmarks. The dermatitis usually occurs over sites of irritation and has a definite line of demarcation. Symptoms may include a burning sensation on the soles of the feet, bright red mucous membrane on the tongue, vagina, anus, or oral cavity.

b. Treatment. Children: 50-300mg Nicotinamide p.o. daily till asymptomatic. Adults: 300mg b.i.d. till asymptomatic.

3. Vitamin C:

a. Deficiency results in scurvy. In mild cases the patient will be weak and listless and complain of joint or bone pains; dyspnea; and the skin can become rough, dry, and brownish. When severe the individual can have erythematous papules on legs and buttocks; petechiae; gingivae which swell and bleed easily; break down old scar tissue; poor wound healing; ecchymosis of joints; deep muscle hemorrhage; peripheral edema; eventual coma; convulsions; and death.

b. Treatment. Children: 50mg Ascorbic Acid daily. Adults: 150mg ascorbic acid daily until asymptomatic. Diet of fruits, vegetables, and fresh meat.

C. Protein Deficiency:

1. Protein deficiency results in Kwashiokor. It occurs primarily in children under five years of age, but can affect anyone. Kwashiokor can lead to the development of cirrhosis of the liver during the course of the disease. Signs and symptoms include retarded growth in children, weight loss, diarrhea, loss of skin pigment, rust colored hair, alopecia, apathy, sluggishness, indifference, a peripheral edema, "pot belly" due to ascities, emaciation, smooth swollen tongue, and anemia.

2. Treatment. Start on adequate protein diet. Vitamins should be added to the regimen later during the course of therapy.

IV. SURGICAL PROCEDURES.

A. Debridement:

1. Incision. Make an incision of sufficient length to permit visual inspection of the depths of the wound. Wounds located on the extremities require the debridement incision to be made in the direction of the long axis of the extremity except when the wound is in a flexion crease. Wounds over flexion creases, large round wounds, and transverse wounds are incised by means of a transverse incision with vertical limbs which convert a transverse incision to vertical exposure and prevents contracture with wound healing.

2. Tissue excision. Inadequate excision will leave necrotic tissue in the wound, pre-disposing to infection and possible later amputation.

a. Skin. Skin is particularly resistant to destruction of its blood supply and with the ordinary perforating type of wound requires only minimal excision. Ordinarily in combat wounds produced by high velocity missiles, only a thin margin of skin (no more than 1 to 2mm in thickness) immediately surrounding the point of perforation needs to be removed. This type of excision permits later closure without requiring skin grafting. In an avulsive type of wound with destruction of the blood supply of the skin flap, the entire flap of skin may have to be excised; thus, necessitating later skin grafting.

b. Fascia. Fascia is resistant to the devitalizing effects of perforation by high velocity missiles. Fascial excision is usually limited by removing by sharp dissection only that amount of tissue which has been shredded or in which so much dirt and grime have become imbedded as to make it impossible for this debris to be removed. Perforated fascia must be incised to the full extent of the skin incision to permit adequate exploration of the more extensively damaged underlying muscle.

c. Muscle. Being both firm and elastic, muscle suffers more damage than any other tissue and, as a result, requires wider excision in order to accomplish adequate wound toilet. While the criteria on which muscle excision are based are definite, they require clinical judgement and as such they demand clinical experience. These are:

(1) Color. Devitalized muscle may vary from a dark hemorrhagic color to a pale fish belly color, depending on the amount of hemorrhage into the local area and on whether the main blood supply to the muscle belly has been destroyed. Generally speaking, in an extremity in which the main vasculature has been lacerated so that exsanguination may occur, the muscle bellies will be pale in color. The intensity of color change is directly dependent on the time elapsed between wounding and the institution of surgical therapy.

(2) Consistency. Normal muscle is relatively firm and rubbery in consistency. Devitalized muscle becomes soft and mushy in consistency having lost its tone and elasticity.

(3) Contractility. When normal muscle is pinched or cut, a sharp contraction occurs. In devitalized muscle, lack of contraction provides proof of lack of viability. In any area of debridement, excision is continued until contractile muscle is encountered.

(4) Bleeding. Normal muscle, when cut transversely, bleeds in amounts proportional to the size of the vessels cut. In devitalized muscle, no fresh bleeding occurs indicating the lack of viability. To ensure a wound clean enough for later closure, do not stop the excision of this tissue until you are beyond the area of nonviability. Ensure that you do not cut either the nerve or blood supply to the muscle group. This leads to further necrosis.

d. Bone. Limit bone to those fragments which have been separated from their periosteal attachments and driven into tissue at a distance from the site of the parent structure. This is especially true in wounds of the face where every effort must be made to conserve every bone fragment no matter how small. In wounds of the extremities, large fragments even if detached from the periosteum, must not be removed because of possible nonunion. The fragment should be thoroughly cleansed and replaced in the fracture site.

B. General Wound Management. Wounds should be irrigated with normal salt solution so that mechanical flushing will remove small particles and debris remaining in the depths. Where indicated, counterincisions in a dependent area will permit adequate drainage from the depths of a deep pocketing type of wound. Moderate sized foreign bodies visualized by x-ray, but not encountered during wound excision, would be looked for provided tissue barriers are not brokwn down during this search. Complete hemostasis should be accomplished so that the wound will remain dry and

no medium for bacterial growth will accumulate in the wound depths. Dressings should be applied so drainage from a wound is not occluded. This requires fine mesh gauze being laid on, not into, the depths of the wound.

C. Wound Closure. Combat wounds, with certain exceptions, should not be closed. This permits later evaluation of the cleanliness of a wound, prevents locking in of infection, and does not delay wound healing significantly. Proper management requires that these wounds be closed 4 to 10 days after debridement provided there is no clinical evidence of infection. Wounds of the head, face, and neck may be closed primarily because of the excellent blood supply in these regions. When nerves, tendons, or large vessels are exposed in the depths of a wound, they should be covered by adjacent tissues to prevent drying. Only adequately debrided wounds may be handled in the above fashion. Frank, purulent discharge from a wound; redness; tenderness; and induration around the wound edges associated with abnormal elevation of the casualty's temperature is an indication of inadequate debridement. Such wounds should not be closed in 4 to 10 days; instead, a period of local soaks combined with secondary debridement may be required prior to secondary closure.

D. Airway Obstruction:

1. The following are far-advanced signs requiring immediate effective treatment within one to three minutes:

a. Cyanosis (may be masked by pallor).

b. Noisy breathing (crowing, stridor).

c. Absence of breathing or little or no air flow detectable at mouth and nose.

d. Straining of chest and neck muscles.

e. Unconsciousness.

2. Nonsurgical maneuvers to relieve obstruction are as follows:

a. Open victim's mouth.

b. Remove fluid and foreign bodies from mouth and pharynx with fingers.

c. Extend the neck and head to prevent kinking of upper airway.

d. Push or pull the mandible forward to prevent obstruction of the pharynx by the tongue.

3. Positive pressure artificial respiration can be administered either by performing mouth-to-mouth breathing with high inflation pressures or by using masks-bag-oxygen unit or positive pressure resuscitator.

a. Many partial obstructions can be overcome by high insufflation pressures provided the airway is cleared of foreign bodies and properly supported.

b. Adequate ventilation is evaluated by the rise and fall of the chest and the free exchange of air into and out of the lungs.

c. If adequate ventilation can be accomplished, continue mouth-to-mouth breathing during transporation or until the victim recovers. Mouth-to-mouth breathing is of particular value because an aidman can immediately sense persistent obstruction if there is inability to inflate the lungs, resistance to flow of breath into the victim, and failure of air to escape from the victim's lungs. Persistant severe obstruction is thus quickly and accurately diagnosed by this method and no further confirmation of the urgent need for emergency surgical airway is required.

4. Emergency surgical airway can be established by emergency tracheostomy by "feel" technique or cricothyroid membrane puncture (method of choice).

E. Cricothyroid Membrane Puncture:

1. Anatomy. The cricothyroid membrane occupies the space between the inferior border of the thyroid cartilage and the superior border of the cricoid cartilage anteriorly. It is immediately subcutaneous, being separated from the skin only by a few thin muscle fibers. There are no significant blood vessels or nerves interfering with the surgical approach. Posterior to the membrane is the lumen of the larynx well below the vocal cords. The posterior wall of the larynx at this level consists of the heav posterior projection of the cricoid cartilage. Even a rather violent plunge of a sharp instrument through the membrane is not likely to result in a posterior perforation of the airway. To identify the membrane quickly

find the V-notch of the thyroid cartilage, slip the finger down over the surface of the thyroid cartilage into the rather soft depression between the thyroid cartilage and the prominent anterior ring of the cricoid cartilage. In women and children the thyroid cartilage is often less prominent than the cricoid cartilage. The membrane is more easily identified by sliding the finger firmly up the soft tissues of the neck in midline from the suprasternal notch until the finger encounters the firm, prominent cricoid cartilage. The distinctness of this structure as compared to the soft tissues and trachea is unmistakable. The finger slips upward over the anterior surface of the cricoid cartilage into the soft spot between the two prominent laryngeal cartilages.

2. Procedure:

a. Identify the target.

b. Make a transverse incision through the skin, about one inch in length and directly over the membrane. Incision is facilitated by pinching up the skin and snipping or sawing.

c. Stabilize the larynx between the left thumb and middle finger and press the nail of the left index finger firmly into the cricothyroid membrane through the skin incision.

d. Pass the point of the instrument along the fingernail with the flat side parallel to the nail and puncture the membrane.

e. Open the airway by spreading the scissors blade or rotating the knife blade 90°. A hiss or air and coughing will usually occur. The opening can be maintained temporarily with a pen barrel, a piece of stethoscope tubing, or even a couple of keys held in the opening. Bleeding is insignificant and easily controlled. No suturing is required because of the small incision.

F. Postoperative Complications of Surgery:

1. Postoperative complications:

a. Atelectasis results when all or a portion of the lung collapses due to the aspiration of small particles of vomitus or the accumulation of secretions which block the smaller bronchi and bronchioles.

(1) Diagnosis in this disease is usually easy since the presence of a temperature elevation over 100°F during the first 24 hours post-operative, in an otherwise uncomplicated case, is most always due to this complication.

(2) Treatment and prevention. Encourage the patient to breathe deeply and cough as soon as possible following the operation. Prevention is ensured by watching the patient for vomiting, positioning him to allow free drainage of the material from his mouth, and using suction to clear the airway.

b. Pneumonia may develop as a sequel to atelectasis or may develop spontaneously in the post-operative period.

(1) Diagnosis. The temperature of your patient persists in remaining elevated despite your treatment for atelectasis and the patient develops signs and symptoms of pneumonia.

(2) Prevention. Pneumonia of this type is bacterial in origin and prevention is accomplished by establishment of adequate ventilation of the lung immediately post-operative, keeping sources of bacteria from the patient, and prevent chilling.

2. Post-operative urinary complications:

a. Urinary retention. This is usually caused by spasms of the sphincter muscles of the urethra from a variety of causes; namely, unfamiliarity of the patient with the use of urinals and an inability to void in the supine position. Prevention depends upon acquainting the patient with the use of urinals and bedpans, changing his position as much as the injury permits, and using side-lying or sitting position if permitted. It is imperative to prevent over-distension of the bladder by using the urethral catheter under strict aseptic precautions to draw off the urine. This may be repeated twice if the patient persists in his inability to void. If it becomes necessary a third time, it is best to leave the catheter in place by using a Foley type catheter or a standard noninflatable catheter taped to the patient. This should be left in place for two to three days, then the patient may be able to resume normal voiding.

3. Post-operative cardiovascular complications:

a. Hemorrhage:

(1) External hemorrhage presents no problem in diagnosis since it is dramatic and easily visible. This almost always results from blood vessels in or near the skin beginning to bleed. Prevention is by meticulous tying of all bleeders prior to closure of the wound. Treatment is dependent upon the extent of the bleeding. Small amounts can be controlled by pressure dressings. If bleeding is extensive, a tourniquet or pressure dressing is used. Preparation should be made to transfuse the patient immediately and after blood or blood substitutes are running; the patient should be returned to the operating area, the wound reopened, and the vessel clamped and tied. The wound is then resutured.

(2) Internal hemorrhage presents more of a problem in diagnosis. It is indicated by the presence of shock postoperatively or postinjury, together with the measurable swelling or distension of an area principally in the extremities. The treatment by an aidman is directed at the treatment of shock. Attempt to control the bleeding by means of pressure dressings and shock therapy plus rapid evacuation offers the best chance of success.

b. Thromboembolic phenomena. See Chapter II.

4. Miscellaneous complications:

a. Wound rupture usually occurs from the sixth to the twelfth day postsuturing.

(1) Etiology:

(a) Removal of sutures too early.

(b) Poor suturing technique (overlapping skin edges).

(c) Poor nutrition.

(d) Severe postoperative coughing or straining.

(e) Wound infection.

(2) Treatment. The patient should be returned to the operating room and the wound cleansed. The wound is then resutured and redressed and the patient should be placed on antibiotic therapy at this time or, if he was on antibiotics, the drug should be changed to another broad spectrum drug to head off infection.

b. Wound infection:

(1) Etiology. Careless handling of tissue and aseptic technique or inadequate hemostasis.

(2) Treatment. In the case of minor infections; the application of local, hot, wet sterile dressings to the area will usually suffice. If the infection is deep and resulting in systemic symptoms, the wound should be partially opened by snipping out some sutures, hot wet dressings applied, and antibiotics started or changed. Allow these wounds to heal by secondary intention.

c. Bedsores. This is a reflection of poor nursing care. It results almost entirely from improper vigilance in the care of the patient's skin and in turning him to take the pressure off the skin over bony prominences, especially the spine, pelvis and heels. Treatment consists of the care of any open wound plus redoubled efforts to keep the pressure off this and other bony prominences.

V. COMBAT FATIGUE.

A. Definition. Combat fatigue is a psychiatric disorder which is fluctuating, transient, and acute. The patient's behaviour is quite variable and may change from moment to moment. It is a temporary condition if treated properly. Its onset is acute, over about one day at most.

B. Contributing Factors. Although many conditions could be implicated in precipitating or preventing the onset of combat fatigue, a few are of paramount import:

1. Good physical condition, rest, food, and general physical health.

2. Duration of exposure to combat.

3. Strength of group identity, morale, esprit, and leadership.

4. Amount and quality of prior military training.

5. Present and anticipated future military situation.

C. Treatment:

1. Treat at the forward area.

2. Expect that he will recover and return to duty.

3. Maintain a military atmosphere.

4. Applying a, b, and c above with provision of indicated sedation, rest, hot food, clean clothes, and opportunity to talk should lead to recovery in two to three days. Patients not recovering may have developed a long term psychosis initially masked by combat fatigue and should be evacuated ASAP.

D. Prevention. Maintain an environment conducive to mental health, send soldier for short breaks rather than awaiting infrequent R&R.

VI. MALARIA AND MISCELLANEOUS INFECTIOUS DISEASES.

A. Malaria:

1. Etiology. Protozoa (Plasmodia species).

2. Transmission. Anopheles.

3. Incubation. 10-20 days.

4. Pathology. Parasitized RBCs with falciparum. All attacks have tendency to thrombosis, hepatosplenomegaly, and anemia.

5. Clinical symptoms. Chills with nausea and vomiting. Fever or hot stages with headache. Sweats with exhaustion, splenomegaly, anemia, and leukopenia. Onset is often abrupt in newcomers, but many times has prodrome of one or two days of malaise, myalgia, headache, anorexia, and slight fever; especially in falciparum; 1966: 6,000 cases of US troops in RVN; 98 percent P. falciparum.

B. Dangerous Types of Falciparum Malaria:

1. Bilious remmitent fever:

a. Nausea and profuse vomiting.

b. Jaundice on second day.

c. Epigastric and liver tenderness marked and severe.

d. Hematemesis.

e. High fever.

f. Dehydration.

2. Cerebral malaria:

a. Sudden or gradual.

b. Headache.

c. Increasing fever.

d. Coma: convulsions (fever may reach 107°-108°), delirium, psychotic states, and cranial nerve involvement. May be confused with acute alcoholism.

e. Often fatal.

f. Treat with quinine: 650mg IV every eight hours for 14 days. Pyrimethamine 25mg every eight hours for three days. Chloroquine 600mg stat, IM then 300mg IM qd for five days with fluids support.

3. Algid malaria. Characterized by extensive vascular involvement of intestines with shock and collapse, jaundice, anemia, and diarrhea.

4. Complications:

a. Rupture of the spleen.

b. Black water fever. Usually in those who had repeated attacks of falciparum.

(1) Onset sudden with chills and fever.

(2) Prostration.

(3) Nausea and vomiting.

(4) CVA pain.

(5) Jaundice.

(6) Sweating.

(7) Hemoglobinuria and acute hemolysis.

(8) Treat with quinine 650gm in 500cc D5W IV every eight hours. IV fluids.

c. Acute renal failurs: Anuria. Treat with quinine and dialysis I&O, evacuate.

5. Scrub typhus, mite-born typhus, and tsutsugamushi fever:

a. Etiology. Richettsia tsutsugamushi.

b. Transmission. Mites.

c. Incubation. One to two and one-half weeks.

d. Pathology. Primarily a widespread focal vasculitis.

e. Clinically:

(1) Initially a painless non-pruritic eschar (one-quarter inch red papule becomes black) at bite site.

(2) Acute onset of fever, headache, chills, and malaise.

(3) Tender regional and often generalized lymphadenopathy.

(4) Slow pulse.

(5) Hypotension.

(6) Cough.

(7) Frequently pneumonia and occasionally splenomegaly.

(8) Rash appears in five to ten days on trunk. Patients frequently become markedly better at onset of rash. Begins as maculo-papular erythematous, becomes petechial. (One-third patients have rash) (more than half have eschar).

f. Second week. Symptoms continue with conjunctival congestion, varying degrees of deafness, occasionally CNS involvement with trauma, and twitching. Symptoms generally begin to subside at end of second week and convalescence is prolonged.

g. Prognosis. Without treatment 20 percent mortality. Treat with chloramphenicol: 3gm po stat, then 500mg every four hours for six days or tetracycline 1.5gm every six hours for four days.

h. Prophylaxis. Skin repellent, mitacide in clothing, and five percent dimethyl phthalate. Tetracycline can be used to avoid disease in areas with extremely high incidence.

6. Dengue (break bone fever):

a. Etiology. Virus.

b. Transmission. Aedes mosquito.

c. Incubation. Five to nine days.

d. Clinically:

(1) Sudden onset of fever and chills.

(2) Severe headache.

(3) Retrobulbar pain.

(4) Conjunctivitis.

(5) Severe muscle and bone pain.

(6) Generalized lymphadenopathy.

(7) Occasionally diarrhea and hypotension.

(8) Saddle back fever.

(9) Occasionally apathy or depression.

(10) Rash maculo-papular occasionally seen, begins on trunk, goes t extremities third to fifth day. Occasionally seen in mouth. Begins as punctate macular rash, occasionally becomes petechial. After about nin days patient begins to spontaneously recover.

(a) Diagnosis. Lab: Leukopenia 2-5000.

(b) Treatment. Symptomatic: watch oliguria.

(c) Prevention. Mosquito control.

7. Plague:

a. Etiology: P. pestis, gram neg. bipolar rod ("safety pin" form).

b. Transmission. Reservoir in rodents, Vector: flea.

c. Incubation. One to twelve days.

d. Clinical. Bubonic.

(1) Subacute onset of fever and chills.

(2) Prostration.

(3) Axillary or inguinal "bubo".

(4) GI bleeding and ecchymosis. If survives first week, recover. hirty to fifty percent fatality.

e. Pneumonia. May come from bubonic or by doplet transmission.

(1) High fever.

(2) Prostration.

(3) Conjunctivitis.

(4) Fulminant bilateral, consolidating pneumonia, SOB, often cyanotic.

(5) Bloody, "raspberry syrup" sputum.

(6) Death within 24 hours without treatment.

(a) Diagnosis. Lab: WBC 20,000 +.

(b) Gram stain. Sputum, bubo.

(c) Treatment. Streptomycin: lgm every 12 hours IM until afebrile for three days plus chloramphenicol or tetracycline 500mg every six hours, especially with pneumonic form. Isolate patient.

f. Prevention. Insect and rodent control. Vaccine about 70 percent effective every six months. Sulfa lgm po t.i.d. for exposed personnel.

8. Hepatitis:

a. Etiology. Viral systemic disease with acute and occasionally chronic effects on liver. Constituted five percent of Hosp Asm. in RVN 1967; primarily in towns and cities.

b. Transmission. Infectious hepatitis.

c. Serum hepatitis. Contaminated needles.

d. Incubation. 20-40 days (infectious hepatitis). 40-120 days (serum hepatitis).

e. Clinically:

(1) Prodrome 3-7 days. Malaise and nausea.

(2) Pre-icteric. 2-5 days.

(a) Weakness, anorexia, nausea, and vomiting.

(b) Distast for cigarettes.

(c) RUQ pain.

(d) Fever, headache, and myalgia.

f. Icteric. One-to three weeks. Occasionally progressive downhill course, death. Serum up to ten percent; infectious less than one percent. Symptoms as above plus jaundice, hepatomegaly, occasionally splenomegaly.

g. Post-icteric. One to two months. Gradual recovery. Occasionally patient develops cirrhosis many years later.

(1) Diagnosis. Bile in urine and occasionally light stool.

(2) Treatment. Symptomatic: bed rest, fluids, diet, and vitamins.

h. Precaution. Sanitation, waste disposal, water 5.10 p.p.m. chlorine, and scr-en blood donors. GG: 5-10cc IM good for four to six months. (May also use inexposed personnel to prevent development of disease if utilized early and in large doses.)

C. Leptospirosis:

1. Source. Contaminated water. Direct skin contact with patient with water in streams and swamps. Domestic and wild animals pass organisms via urine into water.

2. Incubation. Six to twelve days.

3. Signs and symptoms:

a. Severity. From mild flu-like to acute febrile hemorrhagic oliguria state.

b. High fever, headache, and severe myalgia.

c. Conjunctival congestion (petechial).

d. Jaundice. Third to fifth day.

e. Oliguria.

f. Mortality 10-30 percent.

4. Treatment. Supportive care necessary. Penicillin 5 million units IV daily if started by second day may help.

D. Yellow Fever:

1. Etiology. Virus.

2. Transmission. Aedes agypti.

3. Distribution. South and Central America, Africa, South of the Sahara, and parts of the Carribean. Not seen in areas where dengue is present.

4. Pathology. Necrosis of liver and GI hemorrhage.

5. *Incubation.* Three to six days.

6. Signs and symptoms:

a. One to two days of increasing fever.

b. Malaise and myalgia.

c. Headache. Third to fifth day.

d. Jaundice.

e. Petechial hemorrhages and GI bleeding.

f. Death usually occurs, if at all by the seventh day. Mortality rate is in the range of 10 percent.

7. Treatment. Supportive.

8. Prevention. Mosquito control and personal protective measures.

9. Vaccine. Live attenuated virus grown in chick embryo is excellent prophylaxis. Cannot be given to patients allergic to eggs.

VII. RABIES.

A. General. The treatment of rabies, despite certain recent improvements, still has definite hazards. There is no cure known for rabies (death occurs about three days after symptoms begin). Therefore, it is most important to decide if a patient really needs to be treated, and if so, what treatment is necessary. Hospital treatment should be strongly considered for bites on the face, and multiple deep bites. Find out the circumstances surrounding the incident: was it a provoked attack; was the animal behaving strangely; if a domestic animal, had it been vaccinated recently against rabies; are you able to secure the animal for observation; and is rabies prevalent in your area? If you are able to observe the animal for ten days and the circumstances surrounding the incident is not especialy suspicious, you may withhold treatment pending development in the animal under observation. If the victim has sustained multiple deep bites or bites on the face, you may want to start treatment immediately. Terminate your treatment if observation of the animal or examination of the brain proves to be negative. The brain of a suspect animal should be sent to the nearest laboratory capable of performing the examination in either of the following ways:

1. The animal sent alive, well caged, and guarded.

2. Send the entire head, packed in an iced, water-proof package, after killing the animal by shooting it in the heart. Do not use dry ice, alcohol, or phenol to preserve the brain for shipping, as this will make the necessary diagnostic procedure impossible to perform. After about two hours at 90°F the examination cannot be done.

B. Treatment:

1. Wash all wounds thoroughly (five to ten minutes) with soap and water. This is the most important step.

2. Administer rabies vaccine (either duck egg or Semple type) 0.5cc Sub Q every day for 14 days. This is given into the abdominal tissue in any systematic pattern. The vaccine must be cooled. If you cannot cool the vaccine, evacuate the patient to another area that has this ability. Patients allergic to eggs cannot take this vaccine.

3. One thousand units of hyperimmune serum (adult and children: 40 units/kgm) injected at the wound and various deep IM sites. It must be given in the first 12 hours following the bite to be beneficial. There is a significant number of reactions to the serum and this procedure is limited to physician usage only in patients with a very high suspicion of rabid bite.

4. Use antibiotics for local wound care.

5. Isolate the animal and observe or evacuate as described. Note: Rabies is very prevalent in RVN. Of about 240 dogs autopsied in 1967, one in four were rabid. All of the patients with dog bite were evacuated for treatment. There were no known rabies cases following rat bites; therefore, victims were treated with local wound care, tetanus toxide, and the duck vaccine which is shipped out to the "A" Detachment for use on site if refrigeration is available.

VIII. NEUROLOGY.

A. Introduction. Lack of oxygen to the brain is the most common cause of death following head injury; therefore, establishment and maintenance of adequate respiratory exchange is the most important consideration in treating head injuries. The quality of first aid determines to a great extent the ultimate outcome of a patient with neurologic disease.

B. Anatomy:

1. Brain:

a. Cerebral hemispheres are the center of highest intellectual functioning and complex motor and sensory activities. They are divided into four lobes where specific functions are localized:

(1) Frontal: personality and intellectual performance.

(2) Temporal: hearing.

(3) Parietal: sensory and voluntary muscle activity.

(4) Occipital: vision.

b. The cerebellum controls balance and coordination.

c. The medulla is at the base of the brain stem and is the center which regulates pulse, blood pressure, and respiration.

d. There are twelve pairs of cranial nerves:

(1) Olfactory. Smell.

(2) Optic. Vision.

(3) Oculomotor. Movement of the eye and pupillary reflex.

(4) Trochlear. Movement of the eye.

(5) Trigeminal. Sensation of the face, corneal reflex, and chewing.

(6) Abducens. Movement of the eye.

(7) Facial. Movements of the face.

(8) Auditory. Hearing and balance.

(9) Glossopharyngeal. Gag reflex.

(10) Vagus. Vocal cords.

(11) Accessory. Trapezius muscle.

(12) Hypoglossal. Tongue protrusion.

e. The brain is continuous with the spinal cord which is the pathway for nerve impulses from the periphery to the brain. Paired spinal nerves, one for each vertebral segment, exit from the spinal cord.

f. The brain and spinal cord have bony, hard coverings (skull) and membranous coverings (dura matter which lies external to the others and is immediately beneath the inner periostum, the arachnoid membrane which lies beneath the dura mater, and the pia mater which lies internal to all the others and is adherent to the brain or spinal cord tissue).

g. The spinal cord and the brain are bathed on the inside and outside by cerebospinal fluid.

C. Head Injury:

1. Increased intracranial pressure (ICP). Since the skull is rigid, hemorrhage or edema will displace normal fluids and compress brain tissue. The displacement of CSF does no harm, but the reduction of blood supply results in brain damage.

2. Neurological diagnosis:

a. Vital signs of increased ICP are the opposite of those in shock (pulse and respiration decrease and blood pressure and temperature increase).

b. Level of consciousness is the best sign of adequate oxygenation of brain cells. Patients who are unconscious following head injury and then regain consciousness have good prognosis. Patients regaining consciousness and then becoming unconscious again should be evacuated immediately. The best signs for presence of epidural or subdural hematoma and increasing ICP is decreasing consciousness following injury.

c. Pupillary reaction plus size of muscles moving eye are likely to be affected by head injury. Unilateral dilation of one pupil is usually an indication of increasing ICP when it occurs after head injury. Bilaterally small pupils usually mean brain stem injury and a poor prognosis not usually improved by surgery.

d. Gross neurologic deficit as paralysis or anesthesia of one or more limbs, convulsions, babinski, or any other progressive neurologic deficit is indication of increased ICP and immediate evacuation.

3. Closed head injury:

a. A concussion is a mild head injury characterized by brief loss of consciousness without demonstrable neurologic changes. Retrograde amnesia may be present. Treat with bed rest and observe 24 hours or longer if more severe.

b. Contusions and lacerations are longer periods of unconsciousness. Mental confusion, paralysis, cranial nerve signs, sensory defects, and others are often present after consciousness is regained. In the recovery phase, headaches and dizziness may persist for months and amnesia may be present for events immediately before and after injury.

c. Intracranial hemorrhage:

(1) Epidural. Blood collects between dura and skull usually as a result of rupture of middle meningeal artery.

(2) Subdural. Collection between dura and arachroid and may be acute or chronic. It is due to torn cortical vein. Symptoms are like tumor with chronic subdural.

(3) Subarachnoid. Symptoms are severe headache and stiff neck.

(4) Intracerebral. Injury is located in brain tissue.

d. Stroke is the most common cause of brain function disturbance and includes all diseases resulting from interference with the blood supply to brain tissue. It may be spontaneous as in cerebral thrombosis, embolism, or cerebral hemorrhage; trauma; or subarachnoid hemorrhage. Closed head

injuries occur with severe head injuries associated with loss of consciousness (except chronic subdura). The clinical patterns usually follow one or two causes:

(1) Following a head injury of sufficient intensity to render unconsciousness. The patient remains unconscious, but with variations in level of his consciousness as in severe contusion.

(2) More commonly in epidural and subdural hematoma, there is an initial loss of consciousness and a return after a few minutes. The patient is then relatively lucid (from a few hours to a day), but again gradually loses consciousness. This particular clinical history demands immediate surgery by a competent surgeon.

4. First aid treatment for head injuries:

a. Maintain an airway by removing constrictive clothing, bringing jaw forward, and crico, prn.

b. Apply sterile dressing.

c. Control bleeding.

d. Do general neuro. Examine as above.

5. Further treatment when conditions stabilize:

a. Treat for shock as with hemorrhage. Rarely due to head or scalp injury itself.

b. Fluid plus electrolyte balance, give usual DMR. Do not over hydrate.

c. Skin care. Turn every one hour.

d. Prevent fecal impactions. Use enemas prn.

e. Watch for urinary retention. Catheterize when necessary.

f. Watch for aspiration. Do not use morphine if avoidable. Keep patient in lateral or prone position.

g. Continue neurological evaluation.

h. If evacuation is imminent (less than one to two hours away) and patient has signs of acutely increasing ICP: 25 percent Mannitol (250cc in one hour) or 30 percent urea 1gm/kg IV will acutely reduce increased ICP. Rebound, increased ICP occurs one to two hours after treatment so this is a temporary measure.

6. Specific injuries and conditions:

a. Scalp lacerations: skin, connective tissue, APO neurosis, i.e., Galea Aponeurotica (thick facial layer), loose connective tissue, Percosetium

(1) Do wide prep.

(2) Clean the skin with copious soap and water.

(3) Irrigate the wound with plenty of normal saline.

(4) Infiltrate the wound margins with any available one percent local anesthetic. Epinephrine valuable here. Very vascular, much bleeding.

(5) Remove any devitalized tissue found within the wound.

(6) With the gloved finger explore the skull for any fractures.

(7) Close the wound with a single deep layer of heavy suture (e.g. at least 2-0. May use wire).

(8) Give tetanus toxide 0.5cc IM.

b. Subgaleal hematoma:

(1) Etiology. Linear skull fracture (non-depressed).

(2) Clinical findings. A fluctuating mass on the scalp which may cross suture lines.

(3) Treatment:

(a) Aspirate under aseptic conditions.

(b) Apply a pressure dressing.

Note: This hematoma will undergo spontaneous reabsorption; however, it is painful and may cause elevated temperature.

(4) Subgaleal hydroma:

(a) On aspiration, cerebro-spinal fluid is obtained instead of blood.

(b) Treatment:

(1) Stop aspiration.

(2) Apply a pressure dressing.

(3) Watch for CSF infection.

(c) Open skull fracture. Ordinarily you will not be required to care for these, however, should the need arise, you must be able to offer more than first aid.

(5) Signs of skull fracture and treatment:

(a) Wide prep.

(b) Remove all foreign bodies, including small bone fragments.

(c) Suck out macerated brain with an asepto syringe.

(d) Achieve complete hemostasis.

(e) Close dura mater.

(f) Close scalp.

(g) Give prophylactic antibiotics, i.e. pen and strep.

(h) Ambulate patient as early as possible.

Note: If the wound is open but the dura is intact do not incise unless the dura is grossly distended by a massive blood clot. The dura provides protection against introduction of bacteria. If the dura is massively distended, incise the dura and suck out enough clot to reduce the tension subdurally then suture the dura closed and close scalp over the wound. If the wound is such that the dura has been entered but the scalp is insufficient to cover the wound, then make a relaxing incision in the scalp nearby. Apply a pressure bandage to the relaxing incision.

(6) Four signs of skull fractures:

(a) Cerebro-spinal fluid rhinorrhea. This is associated with a fracture of the cribiform plate. Use TesTape to make the diagnosis. (Finding sugar in the rhinorrhea.)

(b) Cerebro-spinal fluid or hemorrhage from the ear. This is associated with a fracture of the temporal bone.

(c) Battle's Sign. Ecchymosis at the mastoid process with basilar skull fractures.

(d) Subgaleal hematoma. Usually a linear skull fracture exists.

7. Different diagnosis of coma:

a. Accidents.

b. Epilepsy.

c. Infection or ingestion.

d. Opiates.

e. Uremia and other abnormal metabolic states; e.g., heat stroke, insulin overdosage, diabetic coma, and CO_2 narcosis.

8. Meningoencephalitis. Encephalitis is always bad and the prognosis guarded even under the most favorable conditions.

a. Causes:

(1) Extensions of bacterial infection from otitis media.

(2) Acute frontal sinustis.

(3) Malaria.

(4) Numerous viral encephalitides.

b. Signs and symptoms. Due to the difficulty in differentiating these illnesses in early stages especially in a restricted environment and with minimal laboratory facilities, we will list those signs and symptoms referable to infectious disease affecting the brain and meninges, and a standard treatment for all until more complete medical facilities are available. This standard treatment; however, should not prevent you from attempting to difinitively diagnose the disease; for by the very virtue of using the same treatment for many causative organisms, it can never be the best treatment for any one disease.

(1) Any patient who has the onset of acute illness manifested by fever with severe headache or stiff neck.

(2) Alterations of consciousness to include confusion, delirium, coma, convulsions, neurologic signs (rigidity) and Brudzinski or Kernig's sign.

(3) Wide variety of neurological signs as absence of DTR, plus Babinski, local paresis or paralysis, or eye signs.

c. Treatment:

(1) Attempt to evacuate at earliest possible moment.

(2) Rule out malaria repeated thick smears if no lab available, rule out by absence of cyclic nature of attacks or epidemiologically. If cannot rule out malaria by above in addition to what follows give chloroquine and quinine two 5gr tablets every eight hours p.o. for 14 days which is treatment for cerebral malaria. If patient cannot take treatment via p.o. route use parenteral quinine in same dosage but give it in very slow IV drop with saline or use chloroquin 200mg IM every six hours. Don't try to give quinine without saline or rapidly as the tissue sloughs and cardiac arrhythmia may occur.

(3) Symptomatic treatment. IV fluids or gavage for comatose patient.

(4) Antibiotics. Aqueous penicillin 10-12 mill. unit/24 hours, plus chloramphenicol 2-3 gms q.d., plus sulfadiazine 4-6gm q.d. Put all three into IV bottle and let run in over 24 hour period. Do this daily until patient responds.

(5) If patient does not respond to this treatment, then you have done all you can.

(6) Anticonvulsants prn. e.g. phenobarbital, amytal.

D. Convulsions. Convulsive disorders are abrupt transient episodes of motor or sensory nature usually associated with changes in consciousness. There are many types of seizures but those of most importance to us are Grand Mal and Febrile convulsions.

1. Grand Mal convulsions or major motor seizures may be idiopathic or due to pathologic states (brain tumor, CVA, head trauma, intracranial infections, uremia, hypoglycemia, hypocalcemia, overhydration). Grand Mal is classically described as having an aura just prior to seizure; i.e., memory phenomena, taste, and visual change. The unconsciousness patient may emit a cry then tonic contraction, then severe clonic moments. Patient may have frothing at mouth, incontinence, and tongue biting. Then post ictal state (i.e. sleep) occurs for several hours. Fever of 102°F or higher may precipitate grand mal seizure in children without other cause. Avoid by using ASA, diluted alcohol or water bath prn.

2. Treatment of grand mal convulsions in RVN:

a. Rule out other diseases as possible cause; i.e., presence of meningitis, brain trauma, inebriation, uremia, or fever in children.

b. Evacuate.

c. During seizures (usually less than five minutes) cradle head, restrain only enough to avoid damage, and insert semi-soft material between teeth to protect patient from biting tongue.

d. As long as seizure does not last longer than five minutes (the usual case), no drug treatment is indicated. If patient continues to convulse, put 500mg sodium amytal in syringe and inject at rate of 100mg/min. After 1-200mg patient will become unconscious and stop convulsing. At this point stop drugs.

e. Other anticonvulsants which can be used include: dilantin IV not more than 50mg/min up to 250mg, phenobarbital IV up to 8gm, paraldehyde 1-2ml with 1:3 mix in saline IV slowly or 8-12cc IM, ether 1/2:1 in mineral oil rectally not to exceed 160cc total in adult male, and morphine up to 1/2 gr IV as a last resort when patient has continued to convulse and no other medications are available.

f. After patient stops convulsing, maintain him on phenobarbital and/or dilantin IM or po as indicated.

g. Standard prophylactic anticonvulsants for grand mal seizures are dilantin 0.2 - 0.6gm daily and/or phenobarbital 32-64mg q.i.d. po.

h. Most convulsions occuring for first time in US troops in RVN are of unknown etiology and do not return. Almost all can be returned to full duty.

3. Hyperventilation is caused by anxiety produced by rapid breathing and subsequent decreased CO_2 and its attendant symptoms.

a. Signs and symptoms:

(1) Rapid respiratory rate.

(2) Anxiety.

(3) Light headedness or fainting.

(4) Numbness or tingling especially in hands and around mouth.

b. Treatment. Reassurance, holding breath or breathing into a paper bag over nose and mouth. Recovery within a few minutes.

IX. DIAGNOSIS AND TREATMENT OF ACUTE FUO.

A. Diagnosis. Make sure the fever is unknown (unknown refers to the limit of your experience, determination, and knowledge).

1. History. A good history is a must and the more you can get, the better your chances of making a definitive diagnosis. Be sure to include history of travel, drugs, immunizations, and diseases common in the area and which are most likely to present with fever.

2. Meticulous P.E.. Ears, sinus, throat, teeth, veins, heart, meninges, and skin. Unclothe and clean patient. Look hard!.

3. Review. History and P.E.

4. Laboratory. If available, rarely will it make a diagnosis for you unless you know what you are looking for, although it will give direction to your thoughts.

a. Malaria smear. Take at peak of fever, will see ring forms, or six hours after fever peak.

b. CBC. Polys, lymph, Eos: U/A; stool examination for O&P: sputum for AFB.

5. Paroxysmal. If the patient is mortally ill initially, assume diagnosis is malaria and treatment is chloroquin 600mg IM start, 300mg after six hours, then 300mg q.d. for two days. If not mortally ill, hold off therapy for 36 hours. If patient is getting worse, it is probably malaria. Patients, in poor health to begin with, will present sooner and be sicker than those with good health.

6. Subacute:

a. After 36 hours, diagnosis may make itself clear on P.E. (rash, dysentery, CNS, jaundice, and joints).

b. If after 36 hours, diagnosis is still unclear, may treat malaria and use a broad spectrum antibiotic (tetracycline 500mg every six hours). This will cover typhus, amebiasis, typhoid, and shigella. ASA and rest will serve for dengue group, hepatitis, and serum sickness.

c. If no response after 48 hours, evacuate.

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B. The Range of Differential Diagnosis of FUO - Acute.

Viral	Bact	Rickettsial	Spirochetal	Protozoal	Helminths	Non-Infection
Arbovirus group	Typhoid	Typhus	Leptospirosis	Malaria	Visceral larval migrans	Drug: allergy
(encephalitides)	Salmonella		Rat Bitefever	Amoebiasis	Trichinosis	Serum sickness
	Shigella		Relapsing fever			Factitious
Dengue group (chickungunya Hemorrhagic fever)	Rheumatic fever		(louse borne)			Heat stroke
Hepatitis						
Exanthemas						
(Measles, pox's)						

Statistically most likely in RVN

(3) Malaria - (1) Dengue group - Hepatitis - Scrub typhus - (4) Enteric group: Typhoid, Amoebiasis - Drug related/Heat

(of acute FUO's - some paroxysmal in onset, some subacute)

Paroxysmal	Intermediate	Subacute
Malaria	Scrub typhus	Typhoid
Dengue group	Heat	Enteric group
Drug Allergy (not anaphylaxis)		Hepatitis
		Serum sickness

X. ORTHOPEDICS.

A. General. The diagnosis of fractures without the help of x-rays requires the utmost use of history and physical examination. The patient or witness must be questioned as to the exact mode of trauma so the examiner can determine if a possible fracture exists. Where the differential of sprain vs. fracture exists; then, the only differentiating findings may be the relative mildness or severity of the systems and the physical findings; e.g., fractures which swell quickly are more painful and more prone to bleed than sprains. If significant doubt exists then the patient must be treated as a fracture.

1. Signs of fractures:

a. Swelling.

b. Ecchymosis (bleeding beneath the skin).

c. Deformity.

d. Inability to use injured part.

e. Tenderness.

f. Muscle spasm.

g. False motion.(elbow bent in wrong direction).

h. Crepitus (the grating together of fractured bone ends).

i. Remember that at the time of the fracture, bleeding occurs at the site. In the case of large bones, several liters of blood may be lost inside the extremity; therefore, the patient must be observed and treated for hemorrhage and shock expeditiously.

2. Principles of casting and splinting:

a. Splint them where they lie. Gross deformities may be gently corrected to alleviate circulatory inhibition.

b. Cast in the position of function.

c. Immobilize one joint above the fracture and below the fracture.

d. If in doubt treat as a fracture.

e. Look for shock.

f. Reduce dislocations and fractures ASAP.

g. Use anesthetics for reduction prn. Fracture reduction can usually be accomplished under local anesthesia although an adjunct; e.g. morphine 15mg IV can be used for very painful procedures or major joint dislocations. Inject the local anesthetic into the hematoma of the fracture (aspirate hematoma blood into syringe to insure correct location of needle).

h. Elevate extremity and cool. This reduces pain and edema. This treatment is effective for contusions, sprains, dislocations, and fractures.

i. Pad area of pressure.

j. Bivalve all casts. Cut casts on lateral and medial sides while wet and hold in place with ace wrap. After swelling subsides (about three days), replace ace with plaster wrap.

k. Check extremities frequently for circulation loss.

(1) Temperature. Extremity becomes cold.

(2) Color. Extremity turns pale, then blue.

(3) Sensation. Patient has numbness and tingling.

(4) Pulse.

l. Immobilization is the key to successful fracture repair. Remember that swelling will decline and muscle atrophy will occur thus creating space inside a cast; therefore, each patient will require recasting.

m. Check healing with direct manual stress. Minimum times quoted in this manual. Healed fractures are non-tender and non-painful.

n. Actively maintain non-immobilized joints and muscles. Exercise and rehabilitate the immobilized areas after healing. Muscle will atrophy and joints will stiffen if not used and permanent disability can result from disuse alone. Expect swelling and soreness with initial use after any immobilization.

B. Fractured Clavicle. This is the most common fracture in children and usually involves the middle half of the bone.

1. PE. Point tenderness, shoulder drops, proximal clavicle elevates, and localized pain.

2. Treatment.

(a) Immobilize with figure 8 bandage with or withour plaster (pad axillae) for minimum of three weeks.

(b) Forearm sling.

(c) Check nerve and circulatory function before and after immobilizing.

C. Acromioclavicular Dislocation. This is due to trauma at the shoulder.

1. PE. Tenderness and pain at gap, shoulder drops, and clavicle elevates. Compare both shoulders with #5 weight in each hand. Feel for gap between clavicle and acromion process.

2. Treatment. Sling. Remove sling daily, do 360° rotational exercises with arm, and use the sling until symptoms are gone (about six weeks).

D. Humeral Fractures.

1. Proximal fractures. They are usually impacted and stable. Treat with sling and swath; i.e., arm bound to chest via strap around chest and leaving opposite arm free, for ten days, then remove sling and progressively exercise.

2. Midshaft fractures. They are common and frequently involve radial nerve damage (look for wrist drop) and can be treated with hanging plaster case; i.e., plaster cast from fracture site (not above site) to mid-forearm with elbow in 90° flexion.

(a) Attach loop from distal cast to support around neck.

(b) This cast must be heavy enough to provide continuous traction on the fracture but it must not pull the fragments away from each other so much as to cause non-healing.

(c) Keep in hanging plaster for six weeks minimum. The patient must remain in semi-upright position even when sleeping.

3. Distal fractures. They swell markedly and cause obstruction to circulation of the forearm; e.g., Volkmann's ischemic contracture. The possibility of producing ischemic contracture is so great and the damage so incapacitating, that it is better not to treat this fracture but rather support the circulation. Hold the hand and arm up by using available support devices such as gauze from wrist to ceiling. Insure that the elbow is flexed slightly and monitor circulation by nailbed capillary fill. Maintain support until the swelling has cleared (about three weeks), then put in posterior plaster splint for three weeks. Do not flex elbow to 90°.

E. Metacarpal fractures. Boxing injuries. Bennett's fracture - first metacarpal fracture at proximal end. Reduce with direct pressure on the fragment, then apply plaster gauntlet for three weeks with thumb abducted. In all metacarpal fractures the distal segment migrates to palmar side and the proximal fragment goes dorsally. Plaster in place from mp joints to mid forearm for three weeks. If fragments are greatly separated, approximate them first with direct pressure in place.

F. Phalangeal Fractures.

1. Finger dislocations. Fingers can be reduced with a firm steady pull on the dislocated end while bending the finger forward if the dislocation is posterior and backward. Fractures are usually not markedly displaced. If so, they can be reduced by manual traction on the digit in its long axis with direct pressure on the fragments. Splint the finger on the palmar surface and tape at adjoining finger for three weeks. Immobilize in the position of function (the fingers are curved as if a softball were being grasped in the palm).

2. Toe fractures. Reduce. Pad between and tape to adjoining toe.

G. Forearm Fractures. Treat with "sugar tong" splint; i.e., anterior-posterior plaster splint from anterior metacarpal phalangeal joints ("mp" joint, around elbow in 90° flexion back to "mp" joints posterior with hand pronated 90°). Hold splint in place with ace bandage as with bivalved cast. If fracture is displaced, it can usually be molded into place with traction in the axis of the extremity and direct pressure on the fractures. Fracture can be casted after swelling recedes. Cast for upper forearm and mid forearm is from mid palm to upper arm with 90° elbow flexion and wrist in position of function. Splint or cast for about 12 weeks. Fracture of the distal radius known as Colle's or Silver form deformity is common. It involves falling on the outstretched arm with hyperextension of the radius. The distal radius fractures and migrates dorsally and radialward producing what looks like a family dinner form when viewed laterally. In order to achieve an acceptable result, the radial length must be restored and the end of the radius must approximate its original angle to the metacarpals. A hyperflexion fracture of the radius may occur in a similar manner and may also be reduced with the following method in reverse direction. Grasp the hand of the injured wrist in a hand shake manner and apply traction at the elbow. The hand is pulled in palmar flexion and full ulnar deviation while the forearm is held in pronation. Press with the other thumb against the dorsal surface of the distal fragment and force it anterior and medially into place. Reduction is satisfactory when the normal contour of the wrist has been restored. The radius is about 1cm longer than the ulna. Cast in hand gauntlet from mp joints to upper forearm.

H. Fractured Vertebra (Compression). Results from vertical shock to spine; e.g., bad P.L.F. There is usually muscle spasm, tenderness, point tenderness over the vertebra, and no reflex changes. Nerve damage and ileus can occur and must be checked. Treat with bed rest (firm mattress) 7-14 days and analgesics. Fractured vertebra (non-compression) occurs from hyper flexion or hyperextension injuries. With cord damage patient may have paralysis, incontinence, numbness, and DTR changes. Insure that spinal cord damage is not initiated or worsened. Always move the entire vertebral column as a non-flexible unit. Sand-bag head (with neck fractures); more patient supine; support fracture area; flat bed rest (8-10 weeks); indwelling urinary catheter until spontaneous voiding possible; analgesics and supportive care; daily enema to avoid fecal impactions (feel for fecal impaction if patient has several days without bowel movement then begins diarrhea); avoid bed sores; and evacuate ASAP.

I. Femur Fractures.

1. Signs and symptoms. Severe pain with external rotation and shortened extremity. Considerable loss of blood and shock.

2. Treatment. Treat with continuous traction. A Thomas splint can be used, but the pressure points must be heavily padded and checked frequently to avoid necrosis of the tissue at all points of contact between splint and thigh and ankle. If it is possible to use tibial tubercle wire and traction this is preferable and it may be possible to use this and maintain a Thomas splint in a ready state for emergency evacuation. Skin traction may also be used in conjunction with a Thomas splint. Continuous traction must be maintained 12 weeks with graduation to guarded weight bearing in 16 weeks. Patient is ready for full weight bearing when he can lift leg and fracture site is not sensative to pressure. (At least six months).

J. Tibial and Fibula Shaft Fractures. All tibia and fibula fractures are casted in a long leg cast with full knee extension and 90° ankle flexion. Weight bearing is started immediately. The patient is allowed to put as much weight on the leg as he can tolerate. He will usually be full weight bearing by 2-3 weeks. Maintain the cast about ten weeks. Junction proximal two-thirds and distal one-third tibia is slow healing. The tibia and fibula have prominences at the distal end called lateral (fibula) and medial (tibia) fracture. The tearing of a major ligament is as serious as a fracture of the bone in the same area. The presence of dislocation fractures may be easy to diagnose because of the deformity. There may be simultaneous fractures of the tibia and fibula (called bimalleolar Fx's). If forced to treat this deformity without x-ray, remember the object is to restore the joint to its normal, stable anatomic position. If no bony distortion is evident, then immobilize in a plaster boot with the foot at 90° flexion and a neutral rotation. If distortion is evident due to malleolar fracture; following analgesia, with patient on back and knee flexed at 90°, apply gentle downward traction on the heel; strongly rotate away from the fracture and apply direct pressure to the malleolus forcing it into place. Hold the reduction and apply a short leg walking cast with foot at 90° and in neutral position and allow to walk PRN. Maintain for six weeks.

1. Ankle Sprains. Common.

a. P.E. Inability to walk, swelling and point tenderness usually below or in front of lateral malleolus (fibula), can be ecchymotic.

b. Treatment. Cool and elevate. Ace bandage from mp joints up above ankle (not too tight) for two weeks and encourage ambulation. If severe, use short leg walking cast for three weeks.

2. Ankle Fractures. Common. Check history. Signs and symptoms occur sooner and more severe than sprains. Signs and symptoms tend to be less localized than with sprains and swelling covers a larger area.

3. Metatarsal (foot) fractures. Results from direct trauma, twist, or "march fracture". Treat with a snug, stiff boot. If this is not sufficient, use walking cast (mp joint to midcalf with ankle at 90°) for three weeks.

K. Shoulder and Hip Dislocation. Shoulder and hip dislocations occur in similar ways and may be reduced using the same principles.

1. General. Shoulder dislocations are common and usually occur by falling onto an outstretched arm. Humeral head dislocates inferiorly then migrates (usually anterior). The patient presents history of this type trauma and localized pain. He cannot touch the opposite shoulder. The acromion process appears prominent; the deltoid muscle is depressed since the humeral head is now sitting much lower (down in the axilla); the axilla is distorted since the humeral head will create a very large bulge (which is easily palpated) in a normally concave surface; and the elbow is displaced away from the body.

2. Treatment. Place patient in face down position on a table with arm hanging down. Give 15mg morphine IV or IM. Fasten approximately five pound weight to hand. Combination of analgesic and weight will cause humerus to relocate. Procedure takes 20-30 minutes. Sling arm for six weeks if it is initial episode. Treat recurrences with sling for a few days. If this method fails or the situation does not allow its use, have assistant apply counter pressure by a sheet, around the patient's chest and under the dislocated arm while you strongly pull the arm out of axilla and allow it to drop into place up into the shoulder socket. If no assistant is available, counter traction may be applied by pulling arm out of axilla while pushing against axilla with bare heel. Even if humeral dislocation and fracture exist, the reduction should be and usually can be attained by using these methods remembering that traction and leverage must be applied so as to avoid bony or soft tissues damages. Watch for circulatory or nerve disturbances following these manipulations. With adequate reapposition of fragments these fractures are also treated with a sling.

3. Hip dislocations. They are usually posterior and the result of a blow driving the femur backward. They require prompt relocation; i.e., less than eight hours or vascular damage results. The short, is flexed, held in internal rotation and abducted. Femoral fractures will go into external rotation, abduction, and extension (the opposite or dislocation) (check sciatic nerve before reducing dislocation). After 15mg morphine IV, place the patient on his back. Have assistant hold patient down while you pull thigh skyward. The traction method using #20 weight and patient in prone position (similar to shoulder treatment).can also be used. Follow with bed rest and mild skin traction (ten pounds) for ten days. No hip flexion allowed during recuperation. Walk when patient is comfortable.

L. Low Back Pain. Low back pain may be caused by acute strain, herniated intervertebral disk, osteoarthritis, infection (TB), and psychoneurosis. Most patients with a history of injury will be acute strains. Acute strains and herniated disk (HNP) look alike and are treated alike.

1. Physical examination. Pain on motion at vertebral column and limitation of motion to flexion, extension, and lateral bend. Paraspinous muscle spasm (hard, may be asymetrical, tender). Spinal curvature laterally may be present. Check for vertebral "step off" deformity (vertebral bone misposition). Straightening of lumbar spine (normal lordosis is gone); check the extremities to rule out neurologic involvement.

2. Signs and symptoms. Usually HNP is located at L4 - L5. The following signs may be present with pressure on the nerves

(a) Bowel or bladder incontinence.

(b) Foot drop (indicative that immediate surgery by a physician is necessary).

(c) DTR's lost at Achilles tendon or knee, foot or leg becomes numb to light touch or pin prick, muscle atrophy, occurs in lower extremities; e.g., patient cannot stand up on balls of feet and great toe is weak to dorsiflexion.

(d) Sciatic pain radiated from low back down one or both legs (posterior buttock to posterior thigh then to heel).

(e) Straight leg raise (+). (Supine patient, medic lifts patients heel and produces sciatic pain at same degree hip flexion each time.) In examining a patient for vertebral fracture and spinal cord damage, these

same signs are checked; i.e., look for signs of fracture at the vertebra by rolling the patient gently onto his side (without flexing or extending patient and check sensation, DTR's, and incontinence). Ask if paresthesias exist. Check for paralysis by having patient move toes, feet, and legs gently by himself.

M. Pyogenic Osteomyelitis. An infection of bone usually due to Staph or Strep. Etiology is hematogenous, extension from nearby abscess or direct innoculation. Location: children - metaphyseal and long bone; with no history of trauma; otherwise, adults and children - site of open fracture. Prophylaxis: open widely, don't close. Adequate debridement of gun shot wound. Treatment: immobilize extremity, large doses antibiotics, aspirate the subperiosteal abscess, and check nearby joints frequently to rule out involvement.

N. Arthritis. Any inflammation of a joint. The great majority will be degenerative arthritis of the joints (osteoarthritis) due to the natural trauma of daily activities for many years. This is the "rheumatism" that old folks complain of and usually seen in enlarged joints, especially fingers and knees. Treat with ASA.

1. Rheumatoid arthritis. Is not uncommon and is characterized in its chronic form by mild pain, stiffness of joints, and the necessity of a warm-up period before joints begin to work comfortably. Long standing severe rheumatoid arthritis can produce incapacitating deformities; e.g., ulnar phalangeal deviation.

2. Pyogenic arthritis. Infection of joint due to blood-borne origin or extension from nearby infection; therefore, history is important. Staph and Strep are most common causes or could be gram negative G.C. Hip and knee most common sites. Signs and symptoms are increase pulse rate, fever, joint pain, heat, swelling, pain with movement, and joint effusion. Aspirate will have pus. Treat with large doses of antibiotics. If not sufficient, then thoroughly prep knee area to produce sterile field for aspiration with large bore needle into joint space from anterior superior border of patella (use local anesthetic), aspirate must contain pus to support diagnosis. Flush saline into and out of joint space then introduce antibiotic; e.g., procaine penicillin 2.4 million units through same needle. Individuals with chronic mild disease can also be treated adequately with ASA.

3. Gout. Gout will occasionally be seen in middle aged males, usually as a spontaneous, acutely painful, exquisitely tender, mp joint of the great toe; but it can occur in other joints. Phenylbutazone (butazolidin) may be

used for an acute attack and is the drug of choice since the patient will be incapacitated with colchicine. Dosage is 400mg followed by 200mg every six hours; do not use for more than three days. Treat with colchicine 1mg every two hours until pain is relieved or nausea or diarrhea appears, then stop the drug. Total dose is usually 4-8mg and attack stops in three days. Patient may require analgesic; e.g., codiene 32mg every three hours. If colchicine or butazolidin are not immediately available use a cortisone systemically with analgesic. Patient should have bed rest during attack. Evacuate if possible for evaluation, but if already aware of diagnosis these individuals can usually be maintained adequately on colchicine or probenecid and remain with the team without difficulty. Probenecid dose = 0.5gm daily increasing into 1-2gm daily. Patient should avoid excessive meat and whiskey.

4. Traumatic arthritis. Is joint disease which occurs sometime after injury to a joint; e.g., fracture into joint and appears as mild pain and swelling with use. Treat with ASA, limit joint use to individuals pain tolerance.

XI. COMMON GASTROINTESTINAL DISEASES.

A. Acid Peptic Disease. Acid peptic disease refers to three common disorders that bear a similar mechanism in their causation. The areas are accessible to gastric acid secretions. These three are peptic esophagitis, gastric ulcer, and duodenal ulcer which occur in about ten percent of people at the same time.

1. Peptic esophagitis. This is due to reflux of gastric juices into the esophagus usually due to excessive vomiting, obstruction to stomach outflow, or most commonly hiatus hernia (a condition where a portion of the stomach herniates through the diaphragm).

a. Symptoms are burning pain beneath the sternum relieved by milk, food, or antacids and difficulty swallowing (as a late complication).

b. When hiatus hernia is the underlying defect, in addition to the above symptoms, the pain is aggravated by lying flat, especially after eating, and relieved by the upright position and precipitated by increase of abdominal pressure as in coughing, lifting, or bending.

c. Peptic ulcers occur only in that portion of the GI tract (stomach and duodenum) which is accessible to gastric acid.

2. Duodenal ulcer. This is five times more common than gastric ulcer and may occur at any age, but especially in young males and is invariably associated with overproduction of hydrochloric acid by the stomach.

a. The symptoms are often atypical. The classical symptom is an epigastric pain described as burning, aching, or gnawing (mild to moderate intensity).

(1) This distress often occurs 40-60 minutes after meals and frequently is worse after spicy foods, alcohol or coffee.

(2) The pain is relieved by bland food, alkalies, and milk.

(3) Patients usually become asymptomatic within three to four weeks, but recurrence is related to stress, emotional strain, or other illness.

b. About one-quarter of the patients develop one of the following complications:

(1) Failure to respond to therapy; i.e., intractable pain.

(2) Hemorrhage.

(3) Perforation.

(4) Obstruction.

c. For diagnosis and treatment see Common Abdominal Diseases that May Progress to a Surgical Problem.

d. Treatment for the uncomplicated case involves:

(1) Removal of stress.

(2) No alcohol.

(3) Reduce or quit smoking.

(4) Adrenal steroids, phenylbutazone, and aspirin should not be used as they may cause hemorrhage or perforation.

(5) Antacids as maalox or gelusil or milk given at least every two hours during acute stage.

(6) Sedation with phenobarbital one-quarter to one-half grain PO q.i.d. may be helpful in tense patient, another reason why team members would not be fit for duty.

(7) Anticholinergics like probanthine 15mg po t.i.d. will reduce gastric acid secretions. Smaller or larger doses may be required to produce dryness of the mouth which is an indication that the dose is adequate.

3. Gastric ulcer. Presents like duodenal ulcer. The burning pain usually in the epigastric region occuring on an empty stomach and relieved by food, alkalai, milk, and sometimes even water. Pain usually occurs 30-45 minutes after meals; frequently associated with nausea and vomiting. Complications are the same as those for duodenal ulcer with the exception that failure to respond to treatment in patients with gastric ulcer usually means cancer of the stomach rather than benign ulcer. There is no evidence that either gastric ulcer or duodenal ulcer leads to cancer. Treatment of both gastric and duodenal ulcers is identical.

B. Diarrheas and Dysentery. Diarrhea is excessive amounts of stool. Dysentery is diarrhea with blood, pus, or mucus. By being able to distinguish between diarrhea and dysentery; one can, with the exception of typhoid fever, distinguish between those diseases with epidemic potential and high mortality (dysenteries) and those with less potential for epidemic and low mortality (diarrheas).

1. Diarrhea. A partial list of causes includes:

a. Infectious disease primary in the intestine as viral enteritis and salmonella enteritis.

b. Toxins, heavy metal poisoning, alcohol, sometimes water hemlock, some shellfish, and alcohol in an aluminum canteen.

c. Malabsorption syndrome and sprue.

d. Secondary to disease in another system; i.e., diarrhea seen in malaria, otitis media in children, and pelvic inflammatory disease.

2. Viral gastroenteritis. This is the common GIs. The epidemiology is much the same as other infectious diarrheal diseases, food or water contaminated with feces. The disease is acute with fever, nausea, vomiting, and diarrhea lasting three to four days. Cramping pain and abdominal tenderness is usually indefinite and shifting. Hyperactive bowel sounds are characteristic. Treatment consists of:

a. An antidiarrheal compound (lomotil 2.5mg po t.i.d.-q.i.d. is excellent).

b. Fluid diet initially, children may have to be NPO and IVs in order to stop the diarrhea.

c. Fluid replacement of deficits.

d. If the patient shows no clinical improvement after two days, tetracycline 250mg po q.i.d. should be started, as in the UW situations you often will have to treat blindly.

3. Salmonellosis. Salmonella food poisoning is due to contamination of food and water with a salmonella organism other than S. Typhosa. Virtually all domestic and wild animals have been shown to harbor these organisms. Symptoms of gastroenteritis develop 8-48 hours after ingestion of contaminated food. Nausea and vomiting usually followed by colicky abdominal pains which may be severe and persistent diarrhea. Low grade fever is often present. Symptoms usually subside in two to five days. The WBC is usually not elevated. The most important aspect of treatment is prompt correction of dehydration and electrolyte problems. Antibiotics are probably not beneficial.

4. Typhoid fever. This is an acute illness that lasts several weeks.

a. First phase. It occurs by ingesting fecally contaminated food, onset usually slow with malaise, headache, cough, and fever which is higher each day. Abdominal pain, constipation, or diarrhea may occur.

b. Second phase. Fever stabilizes, pea soup diarrhea (thick green) but may be bloody begins, patient now very sick and exhausted.

c. Third phase. Slow decrease of symptoms for one week. Relapse may occur.

d. Physical signs. High temperature, low pulse, splenomegaly, abdominal tenderness, and distention. "Rose spots" (sparse papular rash on abdomen).

e. Complications:

(1) Intestinal hemorrhage, sudden decrease in temperature, blood pressure, and increase in pulse rate.

(2) Intestinal perforation.

(3) May involve bones, meninges, lungs, and heart.

(4) Chronic carrier, source of future infections.

f. Prevention. Typhoid-paratyphoid vaccine.

g. Treatment. Chloramphenicol 3-4gms every day po for three weeks. Good nursing care. Maintain intake. Diarrhea treated with lomotil 2.5mg, po t.i.d. or q.i.d. Isolate patient and all excreta.

5. Shigellosis. This is a common disease, especially in poor sanitation areas. This is probably the cause of most of the diarrhea seen in US troops overseas. A dysentery. Epidemic potential.

a. Signs and symptoms. Onset abrupt with diarrhea, lower abdominal cramps, pain on defecation (tenesmus), nausea, and chills. Stool production varies 3-20 stools a day. Stools contain blood, pus, or mucus, classically looks like red currant jelly, smells like freshly laundered linen.

b. Treatment. Isolate patient and excreta. At least three liters per day oral input with at least one liter of saline. Tetracycline or ampicillin 500mg every six hours po. Slow progression of fluid and soft to regular diet. Sedation with phenobarbital prn one-quarter to one-half gr t.i.d., lomotil 2.5mg po q.i.d. may lessen cramps and diarrhea.

6. Cholera. Fecal, oral route. A dysentery.

a. Signs and symptoms. Usually found in warm climates, clinically. Sudden onset, voluminous (6-7 liters per day), watery stool that loses fecal appearance and becomes rice water, and lasts three to five days. Vomiting severe without preceding nausea and cramps. Physical examination shows extreme dehydration. Untreated case mortality (15 to 90 percent), treated two percent.

b. Prevention. Cholera vaccine, two injections not less than four weeks apart. Reimmunization every four to six months.

c. Treatment. Physiologic saline or Ringers lactate (RL) to maintain adequate urine output 50cc/hr. Add one ampule sodium bicarbonate per liter of saline if not responding well or breathing very rapidly. Potassium 20/mg/l when urine output is established. Remember it usually requires at least 10-12 liters of saline first day to adequately treat average case. Tetracycline 1/2gm po q.i.d. to shorten course. Isolate and boil all water, milk, and vegetables. Screen against flies. If circumstances do not permit, IVs - D5W given po will preserve individual for four to six hours till further therapy can be instituted.

XII. SHOCK.

A. General. Shock is a clinical condition characterized by signs and symptoms which arise when the cardiac output is insufficient to fill the arterial tree with blood under sufficient pressure to provide organs and tissues with adequate blood flow.

1. Shock results from failure of one or more of the following:

a. The heart.

b. Blood.

c. Arterial resistance (arteriolar tone).

d. The capacity of the venous bed (venous tone).

2. Causes of Shock:

a. Heart failure; e.g., arteriosclerotic heart disease including MI, arrythmias, tension, and pneumothrax.

b. Hypovolemia (decreased fluid; either blood, plasma or extracellular fluid).

(1) Blood loss, external.

(2) Plasma loss, external.

(3) Water loss.

c. Neurogenic, decreased vessel resistance:

(1) Syncope (fainting).

(2) Spinal anesthetic, spinal cord trauma.

d. Septic shock. Bacterial toxins (especially gram negative) cause increased peripheral resistance and increased venous pooling.

B. Skin.

Degree of Shock	BP (Approx)	Pulse	Temp	Color	Circ	Thirst	Mental State
Slight	To 20% increase	Normal	Cool	Pale	Slowing (Response to pressure blanching)	Normal	Clear distressed
Moderate	Decreased 20-40% Sep 96-72	Increased	Cool	Pale	Slowing	Definite	Clear with apathy
Severe	Below 40% decreased	Weak to absent	Cold	Ashen to cyanotic	Very sluggish	Severe	Apathetic to comatose distress only to thirst

1. Symptoms:

a. The patient in shock appears anxious and looks tired. Later he appears apathetic or exhausted. If the bleeding continues the patient goes into a coma.

b. The skin usually feels cool, is pale and mottled, and the nail beds blanch easily.

c. The pulse rate is characteristically rapid. The rapid pulse may not appear if the patient is in the supine or prone position. The SF medic in doubt as to the shock status of a patient should sit the patient up if possible and look for a decrease in systolic blood pressure exceeding 15 and an increase exceeding 15 in the pulse rate.

d. The respirations of the shock patient are both more rapid and deeper.

e. Another characteristic of the patient in hemorrhagic shock is low peripheral vein pressure. It is because of this phenomenon that the medic must expect early collapse of the usual IV routes; i.e., the superficial veins of the forearm, cephalic vein in the arm, and at saphenous vein at the ankles.

(1) Two sites which remain available longer than the peripheral veins are the external jugular veins in the antero-lateral neck and the femoral vein in the groin which lies immediately medial to the pulsating femoral artery. If you accidently perforate the artery the spurting blood will be obvious.

(2) The treatment is simple compression for five minutes. Have someone else do this while you insert the IV into the other femoral vein.

f. If time is available, a good location for a cut-down is the great saphenous vein in the thigh. Make a transverse incision into the thigh two inches below and parallel to the inguinal ligament which runs from the anterior superior iliac crest to the pubic symphysis. Center your incision on the femoral vein.

g. Once the clinical diagnosis of shock is made, supportive care is instituted and further treatment directed toward the specific type of shock present.

2. Treatment. The primary therapy for hypovolemic shock is fluid replacement.

a. Standard IV fluids listed below are in order of their effectiveness:

(1) Whole blood.

(2) Plasma.

(3) Albumin.

(4) Dextran.

(5) Lactated Ringer's of Saline solutions.

(6) D5W.

b. Remember that sterile solutions can be made with boiling water or adding antibiotics. A fluid IV solution (.9gm %) can be made using:

(1) One canteen sterilized water (1000cc).

(2) Fourteen dissolved salt tablets (10gr tablets).

(3) Sugar can be added if the solution is to be used for DMR.

(4) Very dirty water should be filtered through cloth and the dirt allowed to settle before use.

c. Immediately institute fluid replacement, usually the 50cc albumin, for all but the most minor GSW since the bleeding is usually greater than what is visible. The patient is likely to be stressed a good deal more during evacuation and native soldiers usually have lower hematacrits than US soldiers.

(1) It is important to note that the hematacrit is not a reliable indicator of blood loss immediately after wounding.because both plasma and RBC are lost at that time and initially the hematacrit will appear normal.

(2) The stabilizing mechanisms will provide to replace the decreased volume with extracellular fluid; therefore, the hematacrit will be dropping until bleeding stops and volume is replaced.

(3) The ultimate measurement of your treatment is adequate urinary response and cerebration.

d. The shock position assists the patient in returning venous blood. It is only necessary to have the trunk supine and the legs elevated. There is nothing to be gained by having the head down.

e. Antibiotics should be started ASAP when patients are severely wounded. Generally prophylactic large doses of penicillin or tetracycline are begun immediately.

f. Analgesics such as morphine should be given in small doses IV prn rather than IM since in the shock state the peripheral absorption is impaired and the patient may get no initial effects and then sudden absorption of many small IM doses when stabilization occurs.

g. Steroids such as hydrocortisone 100mg IV every six hours are now felt to have a beneficial effect and should be used when available.

h. Vasopressors such as isuprel, levofed, adrenalin, and neosynephrine, are indicated in:

(1) Septic shock in conjunction with steroid.

(2) Spinal cord trauma and not in hypovolemic shock where they may cause damage.

i. Neurogenic shock includes syncope:

(1) With syncope the BP may be low the pulse rate is slower than normal and the skin is dry and warm.

(2) Treatment is removal from the unpleasant stimulus and shock position.

j. Septic shock usually occurs in recent OB or GU patients.

(1) A result of gram negative exotoxins.

(2) Treatment is as outlined for hypovolemic shock with the addition of large doses of antibiotics; e.g., IV penicillin 10 million units plus chloromycetrin 2gm every day, surgical drainage of the infection if possible and large doses of hydrocortisone (solu-cortef) IV.

XIII. PEDIATRICS.

A. General. The pediatric patient may mean the neonate (up to four weeks), the infant (one month to one year), the child (one year to six years), or the pre-adolescent (six years to 12 years). The treatment and drug dosage, of a nine pound infant may be vastly different from an 11 year old pre-adolescent. The adolescent will be treated generally as an adult (over 12 years old). For purposes of identification, specify the age and the approximate weight of the pediatric patient. In assessing the seriousness or chronicity of a disease in the pediatric patient, a steadily increasing height and weight is not the sign of a very sick patient. A fat child who remains fat is generally not very sick or at least not chronically sick. A child with good appetite is rarely very sick.

1. Estimating average weight.

a. Three to twelve months: weight = age (in months) + 11.

b. Four to eight years: weight = 6 x age in years + 12.

c. Nine to twelve years: weight = 7 x age in years + 5.

d. The newborn generally weighs 7-1/2 pounds (3.4kg) in modern countries, and in deprived countries, will probably be born less than 7-1/2 pounds. Any newborn less than 5-1/2 pounds (2500gm or 2.5kg) is by definition "premature" regardless of the length of pregnancy and will require more care, have less chance of survival, and will grow and mature slower.

2. Vital signs:

	Pulse/min	Respiration/min	BP (Systolic)
a. Birth	140	40	60-80
b. Six months	110	30	90
c. One year	100	28	90
d. Three to four years	95	25	100
e. Five to ten years	90	24	100

3. Laboratory norms for infant and child:

	Birth	Three months	One year	Five years
a. HGB	16-20	10-11	12-13	12.5 - 13.5
b. WBC	10-20,000	5-9,000	6-10,000	6-10,000
c. HCT	50-60	30-33	35-37	38-41
d. Neutrophils	45-55%	30-40%	35-45%	40-50%
e. Lymphs	30-45%	50-60%	50-60%	45-55%

B. Examining the Pediatric Patient. The Newborn:

1. General appearance. The prime concern in the first few minutes of life is respiration. A crying baby has good respiration.

2. Skin color. Definite jaundice in the first 24 hours is pathologic and means infection, erythroblastosis (Rh factor), or prematurity.

3. Extremities. All should move erratically, but all should move.

4. Reflexes. The sucking reflex should be present at birth.

5. Digits. The fingers and toes may be cyanotic, but the trunk should be pink. A depressed baby from too much anesthesia at birth or prematurity, or difficult labor, will lack some of the above. Try simple, mildly, painful stimulation. It may bring the baby out of its depression.

C. Feeding. The child must be fed by frequent intake of fluid and calories. A schedule of feeding is not necessary. A sick child must be encouraged to eat or drink.

1. Breast feeding. This is frequently superior to bottle feeding. Make sure the mother has no breast infection, she has milk, and the infant can suck properly.

2. Bottle feeding. The infant may be fed by breast alternating with bottle or with bottle alone. The milk formula will have to be improvised.

3. Nutritional requirements:

a. Calories per day. First year - 50 calories per pound (about 1000 calories per day at age one year).

b. Fluid. Two to three ounces per pound per day. Feedings may be given as often as possible in the sick child. If he will take it, let him have it unless some medical contraindication exists. The healthy child may eat from three to eight times daily.

c. Caloric content:

(1) Cow milk = 20 calories per ounce.

(2) Evaporated milk = 40 calories per ounce.

(3) Sugar = 120 calories per ounce or 60 calories per tablespoon.

d. Milk will provide enough sodium, potassium, calcium, etc. to nourish any child temporarily. Be sure the milk in rural, deprived areas is pasteurized. BOIL is there is a doubt. (30 minutes is required at a rolling boil.)

4. Improvising a formula. The formula should be about as thick or viscous as cows milk. It should be reasonably palatable. Taste it yourself, if it tastes bad to you the child may not take it either. It should be comfortably warm. The bottles should be sterilized if available. If no bottles are available, spoon feed or drip it in with syringe or tubing. A good oral solution can be made using five percent dextrose and one tablespoon of salt per liter and is especially useful in a dehydrated patient who is not vomiting. It provides fluid, calories, and salt.

5. The dehydrated patient:

a. Signs and symptoms:

(1) Dry skin, mucous membranes, and tongue.

(2) Decreased urine and urine with high specific gravity.

(3) Sunken eyeballs.

(4) Poor skin turgor.

(5) Depressed fontanelles.

(6) Fever.

b. Fluid replacement. Fluid may be given orally, IV (cut down if necessary), and hypodermoclysis (needle from IV setup into soft tissue mass; e.g., thigh).

c. Guidelines to estimate fluid replacement:

(1) Patient must be putting out urine. The urine must be of normal specific gravity, not the dark concentrated urine seen in dehydration.

(2) Does the patient look clinically better or are the mucous membranes moist, and the skin less dry feeling (good turgor)?

d. Schedule of replacement:

(1) Do not try to replace all the fluid deficit in a short period.

(2) Replace approximately one-half the deficit the first 24 hours. The patient will receive his daily requirement plus one-half the estimated deficit in the first day.

e. Summary of fluid and electrolyte replacement in remote areas:

(1) Must be adequate urine output.

(2) Specific gravity is high in dehydration.

(3) Hematocrit is high in dehydration.

(4) Replace fluid any way you can get it into the patient.

(5) If the kidneys are good, they will excrete what they don't need and retain what they need. Do not give potassium solution unless you know the patient has adequate kidney function.

D. Common Diseases of Children and Infants:

1. Diarrhea. Causes:

a. Gastroenteritis. Viral and bacterial (especially E. Coli).

b. Poisoned food.

c. Food allergy.

(1) Treatment:

(a) NPO for six hours.

(b) Begin small frequent feedings of the improvised formula; e.g., one-half to one ounce each half have then progress; stale coke also good.

(c) May try polymagma (ground up tablets or liquid).

(d) Kaopectate, donnatal, paregoric, etc.

d. The patient must still receive his daily fluid requirements. Dehydration can occur quickly in the child who vomits or has diarrhea.

2. Vomiting:

a. Treatment:

(1) Stop oral feeding.

(2) Administer antiemetic parenterally. May use compazine, any of the standard antiemetics in proper dosage for childs weight.

(3) Continue fluid intake. May try sugar water with small amounts of salt. Give <u>small</u> amounts of fluid <u>frequently</u>.

3. Respiratory disease. This may range from croup (acute spasmotic laryngitis) to the common cold with bronchitis.

a. General. Antibiotics are usually indicated in respiratory diseases so use them if in doubt. Penicillin or penicillin with sulfa should be tried. Tetracycline may stain teeth of child. Humid air and expectorants (Robitussin) often help remove secretions. Encourage fluids. Cough suppressants like codeine should be avoided unless the cough is non-productive and severe. Slight sedation with phenobarb, for example, may help alloy anxiety. Severe respiratory disease with excess bronchial secretion,

suction (through nose into trachea) may be needed. In any severe respiratory obstruction, tracheostomy or cricothyroidotomy may be necessary, but only in very extreme cases. This is hard to do in a child and is dangerous.

b. Differential diagnosis of respiratory disease. Consider the following:

(1) Pharyngitis and tonsillitis. Treat with antibiotics.

(2) Bronchitis. Cough present and ronchi heard. Treat with antibiotics, cough syrup expectorant, and force fluids.

(3) Diphtheria. A more serious infection with a characteristic "gray membrane" besides the typical sore throat, lympodenopathy, and fever. Treated by rest, antitoxin, penicillin, saline gargles, sedation, and tracheotomy if needed.

(4) Whooping cough. Characteristic "whoop" at the end of paroxysm of cough, cyanosis during the cough, and 70-80% lymphocytes. Treat with sedation, force fluid, and tetracycline 25mg per pound per day.

E. The Suddenly Ill Child. The sudden onset of illness in a child, especially if fever is present, is usually the result of infection. It is most often a bacterial or viral infection of the ears (otitis), throat (pharyngitis), bronchi (bronchitis), or lungs (pneumonia) and usually will require antibiotics. A general plan of treatment in the absence of definite diagnosis is as follows:

1. Antibiotic (preferably broad spectrum).

2. ASA for fever (one grain per year up to five years given every four hours, over five years, adult dosage given every six hours).

3. Encourage fluid.

4. Sedate if necessary (phenobarb one-eighth to one-quarter for small children every four to six hours and one-half to one grain every four to eight hours in larger children).

5. Maintain fluid and caloric intake and replace estimated loss.

F. The Child With Fever.

1. Fever is generally a sign of infection or dehydration. The infection may be bacterial, fungal, viral, or protozoan. Fever with bacterial etiology is usually accompanied by leucocytosis, neutrophilia, and left shift. Fever of viral origin is usually accompanied by lymphocytosis and often leucopenia. Parasites usually cause eosinophila.

2. Treatment. Ideally the patient should be treated for the specific disease. In a remote situation the diagnosis may never be made. Broad spectrum antibiotics will often cure the infection. Tetracycline should not be used in the premature and can stain teeth in children, even if used for short periods. Additional treatment consists of nursing care and maintaining fluid and caloric intake.

G. Common Diseases in Children.

1. Meningitis. An infection of the covering tissue of the brain and spinal cord. This disease is frequently seen in adults as well as children. The symptoms, signs, and treatment are essentially the same for the two groups:

a. Etiology. The most common agents are bacterial, although viral and fungal agents can also cause similar symptoms.

b. Predisposing factors. These include skull fracture, pneumonia, otitis media, or mastoiditis.

c. Signs and symptoms:

(1) Fever and chills.

(2) Headache and stiff neck, nuchal rigidity, (+) Brudzinski sign: raise head and feet up.

(3) Decreasing mental state with confusion, agitation, and stupor or coma.

(4) Vomiting (projectile).

(5) Convulsions.

(6) Vital signs:

(a) Temperature. 102° to 105°F.

(b) Respirations. Rapid.

(c) Pulse. Rapid.

(d) Blood pressure. Normal.

(7) Skin. In meningococcal infection; very bright, red, purpuric, rash appears predominantly on the face and extremities.

(8) Optic discs blurred. This is an indication of increased intracranial pressure.

(9) Palpation. Bulging fontanelles in the infant is the result of increased intracranial pressure. Slight bulging is normal when the infant cries.

d. Laboratory:

(1) WBC. 15,000 or more.

(2) Lumbar puncture. A procedure putting a needle into the subdural space and withdrawing spinal fluid. You will not do this test yourself due to its importance. The patient must be evacuated to a hospital to have the test.

(a) Culture fluid.

(b) WBC. 500-5,000, normally there are no white cells in the CSF.

(c) Gram stain for the organism.

(3) Culture the throat. Often the causative organism is found in the throat.

e. Treatment. The mortality rate in this disease is over fifty percent in untreated cases. This is a medical emergency!

(1) Evacuate immediately. If a hospital is over four hours away, begin treatment after taking a throat culture.

(2) IV fluids. Begin a program of fluids in maintenance amounts.

(3) Antibiotics. Triple therapy given in the IV bottles should begin as soon as all cultures are obtained or if available, ampicillin 150mg/kg per day IV in four divided rapid infusions.

(a) Penicillin 15-30 million units per day (depending on patient size).

(b) Sulfa 1-4gm per day (depending on patient size). 150mg/1kg to maximum 4gms.

(c) Chloromycetin 1/2 to 2 gms per day (depending on patients size). 100mg/kg to maximum 3gms.

(d) All three drugs should be present in the same bottle.

(e) The amount of antibiotic depends on the size of patient.

(f) The antibiotics should be given around the clock.

2. Febrile convulsions. Grand mal type convulsions occurring in infants secondary to high fever. Temperature must be above 103.0°F to cause convulsion. These convulsions are due to high fever but other causes of convulsions (epilepsy, maningitis, head injury with intracranial damage, and tetany due to hypocalcemia) must be ruled out.

a. Signs and symptoms include high fever and seizure (sudden onset of tonic-clonic activity to the extremities lasting 30-60 seconds with loss of consciousness).

b. Treatment:

(1) Rule out the other causes.

(2) Sedate the patient with phenobarbital (2-4mg per kilogram per day) in four divided doses.

(3) Lower the fever with ASA either orally or rectally and alcohol or tepid water sponge baths. Do not use ice water. This disease is preventable. Don't let the temperature rise and remain elevated. Cool mechanically if nothing else.

3. Chickenpox (and its differentiation from smallpox). Smallpox is a systemic viral infection with major skin manifestations.

a. Symptoms:

(1) Incubation. 14 days.

(2) Prodome includes severe headache, chills, high fever, vomiting, and decreased mental state.

(3) Rash. This begins on the fourth day. It begins with a red papular rash, progresses to vesicles, progresses to pustules, scabs form on the sixth day, and then the scabs begin dropping off at nine days and remain longest on soles and palms. Scarring may develop. This eruption differs from chickenpox in that there is only one crop of lesions.

b. Laboratory. WBC are increased.

c. Treatment includes bed rest, isolation, ASA for fever, and tetracycline 250mg po q.i.d. to prevent severe secondary skin infection.

d. Differential diagnosis:

(1) Smallpox has longer and more severe prodromal period than chickenpox.

(2) Smallpox lesions usually begin on the extremities and chickenpox lesions usually begin on the trunk. Both lesions spread over trunk and extremities.

(3) Smallpox lesions are all in the same stage of development at any one time.

(4) Chickenpox lesions come in batches and so there are lesions in all stages of development.

(5) A patient with smallpox will usually not have a vaccination scar.

(6) Smallpox lesions are deep and multiloculated while chickenpox lesions are shallow and uniloculated.

4. Measles:

a. Rubeola (10 day measles), viral infection. Incubation is 14 days.

(1) Signs and symptoms:

(a) Fever is high.

(b) Runny nose.

(c) Cough is non-productive.

(d) Conjunctivitis.

(e) Photophobia.

(f) Koplik's spots, "table salt crystals," in mucous membrane of mouth; especially at the level of dental occlusion.

(g) Rash begins after prodromal period and are brick red and blotchy. Rash is maculopapular and begins on the face and goes to the trunk and extremities, lasting about five days becoming brown and scaly in latter stages.

(h) Generalized lymphadenopathy.

(i) Can progress to otitis media or pneumonia or encephalitis. In populations where this disease is unknown epidemics may occur with high mortality rates.

(2) Treatment:

(a) Isolate for one week after onset of rash.

(b) Bed rest.

(c) Support with ASA and fluids.

(d) Observe for complications.

(e) Measles vaccines are available for prophylaxis.

b. Rubella (German measles or three-day measles). Virus caused. Incubation two to three weeks.

(1) Signs and symptoms:

(a) No prodrome.

(b) Eruption occurs simultaneously with symptoms.

(c) Symptoms are mild (lasts only three or four days).

(d) Fever.

(e) Malaise.

(f) Runny nose.

(g) Posterior cervical and post auricular lymphadenopathy.

(h) Fine pink maculopapular rash lasting three days (face to trunk).

(i) Leukopenia.

(j) May produce fetal abnormalities if the patient is in the first trimester. Pregnant women exposed to rubella may be given immense gamma globulin IM, but probably has little or no effect in preventing fetal anomalies.

(k) Complications outside pregnancy include encephalitis, bleeding disorders, and strep pharyngitis.

(2) Treatment. Support.

H. Calculating Drug Dosages (Young's Rule):

1. $\frac{\text{Child dose} = \text{age (years)} \times \text{adult dose}}{\text{age} + 12}$ (this is useful for children over two).

2. Childs dose = $\frac{\text{age in months} \times \text{adult dose}}{150}$ (for children under two).

XIV. CHICKEN POX (VARICELLA).

A. Signs and Symptoms:

1. Fever and malaise. Preceding or occurring with a papular rash. The rash then goes from vesicular to pustular.

2. Incubation period. 14-20 days.

3. Organism. Virus.

4. Occurence. Mainly in children who have had exposure two to three weeks earlier. Spread is by droplet or contact with lesion.

5. Differentiation. Chickenpox must be distinguished from smallpox.

B. Cause and Clinical Findings. Symptoms are usually mild and frequently unnoticed prior to onset of papular rash. The papular rash develops into vesicles with clear fluid, then pustules. The rash is generally confined to head, trunk, and sometimes extremities. There are lesions in all stages of development. Which progress from papule to vesicle to pustule with new crops of lesions appearing in two to five days. The crusts usually slough off in seven to fourteen days.

C. Complications. Secondary bacterial infection of the lesions is common. A rare case will develop encephalitis. Steroids will aggravate chickenpox and should not be given to patient with possible chickenpox.

D. Treatment:

1. Isolate until the crusts have generally disappeared.

2. Keep skin clean with frequent washing and clean bed clothing.

3. Antihistamines (Benadryl) will relieve much of the itching. In small children, cut the nails short to prevent scratching.

4. Local antibiotic ointment is of questionable value.

5. Antibiotics may be used if a large number of the lesions are obviously secondarily infected.

E. Prognosis. The prognosis is generally good and fatalities are rare. The symptoms rarely last more than ten days. Lesions generally disappear in two weeks.

F. *Differentiating Chickenpox (Varicella) from Smallpox (Variola):*

	Smallpox	Chickenpox
1. Severity of Symptoms	Severe with headache, backache, postration before rash erupts.	Mild-usually only mild URI symptoms precede the rash.
2. Lesions	All lesions in a given area are in roughly the same stage of development	Lesions are in various stages of development. Papules, vesicles, pustules, present simultaneously.
3. Location	All over body, often on hands, feet, palms, soles.	Rarely, if ever, on soles, palms, or feet.
4. Age	Any age.	Usually children.

XV. AMEBIASIS (AMEBIC DYSENTERY).

A. Etiology. Endamoeba histolytica.

B. Transmission. Fecal and oral route.

C. Reservoir. Man.

D. Definition. Infection by E. histolytica is characterized by acute or chronic phases. Complications include amebic hepatitis, liver abscess, bowel perforation, and peritonitis.

E. Life Cycle. The cyst, infective stage, is ingested with food or drink. They excyst in the intestines in the form of 4-nucleate amebae which soon divide into uninucleate trophozoites. This is the actively growing and multiplying stage (binary fission). The trophozoites attack the intestines (large bowel) and cause ulcerative lesions. As they are eliminated from the intestines, they turn back into cysts if it is a formed stool. Due possibly to the drying of the stool. In order for E. histolytica to be a pathological problem it needs other bacteria present. It is incapable of independent survival in the intestine. When there is severe ulceration there is usually a secondary bacterial infection that follows. Eosinophilia in the peripheral B.S. is not characteristic of amebiasis. Invasion of the intestines may be followed by the entry of E. histolytica into the portal veins and movement of the infection to the liver (usually the right lobe). This can cause hepatitis or abscess. An abscess in the right lobe of the liver commonly extends upward and may penetrate the diaphragm and rupture into the lungs.

F. Diagnosis. Demonstration of E. histolytica in the stool.

1. Liquid stool. Trophozoites or blood stained mucus.

2. Semiformed stools. Cysts or trophozoites in feces.

3. Formed stools. Cysts in feces.

G. Clinical Characteristics. It does not necessarily cause severe dysenteric symptoms because in many cases, only mild, persistant disturbances occur. The principal symptoms in mild cases are diarrhea (usually without gross blood, pus, or mucus in stool), abdominal pain, and tenderness. Fever and leukocytosis are absent. In severe cases, the classical picture of dysentery may appear suddenly or develop gradually from the mild condition:

headache, nausea, gripping ABD, pain, tenderness, fever, increased number of stools, possible tenesmus, and dysenteric type stool. Can have remissions and alternate periods of diarrhea and constipation. Perforation of the intestines is possible in both acute or chronic stages. Secondary infection by Clostridium perfringens can rarely produce a rapid spreading and fatal gangrene. Hepatic involvement includes pain or discomfort over liver and right shoulder, irregular fever, coughing, sweating, chills, nausea and vomiting, weakness, and weight loss. Jaundice is unusual, but possible.

H. Treatment:

1. Tetracycline (po). 250mg q.i.d. x 10.

2. Diodoquine (po). 605mg t.i.d. x 21.

3. Emetine Hcl (IM). Until acute symptoms subside. 65mg IM x 10.

4. Hepatic abscess:

a. Emetine Hcl (IM). 65mg q.d. x 10.

b. Chloroquine (po). .5gm q.i.d. x 21.

c. Diodoquine (po). 650mg t.i.d. x 21 d.

d. Evacuate also for probable surgical repair.

XVI. JAUNDICE.

A. General. Jaundice results from the excessive accumulation of bilirubin, a pigmented breakdown product of RBCs in the blood and tissues. In adults, there are three major categories to consider in the differential diagnosis of a jaundiced patient.

1. Overproduction of bilirubin or hemolytic jaundice. This is caused by an increased breakdown of RBCs, either acute or chronic. Examples: Falciparium malaria and congenital abnormalities of RBCs; i.e., thalassemia, sickle cell disease, and G6PD deficiency.

2. Blockage of the normal excretion of bilirubin in the bile ducts or obstructive jaundice. Examples: Cholelithiasis and parasitic infestations of the bile ducts such as the chinese liver fluke and ascariasis.

3. Failure of the liver cells to process the bilirubin from the blood stream into the bile ducts due to disease of the liver cells themselves; i.e., hepato cellular jaundice. Examples: Cirrhosis and hepatitis (viral, chemical drugs and poisons-bacterial).

4. In the field, without the benefit of various laboratory facilities, the differential diagnosis of the jaundiced patient must be based upon a knowledge of signs and symptoms of the various cases as well as the various causes of jaundice present in the area.

B. Fluid and Electrolyte Therapy:

1. In considering the use of fluid and electrolytes in patients unable to take fluids po, several major factors must be kept in mind.

a. The adult body is approximately 70 percent fluid by weight; and of this, approximately 75 percent is intracellular and 25 percent extracellular.

b. The distribution of different types of fluids, when administered IV, throughout the body. The volume expanders will remain within the vascular compartment; saline remains within the vessels a short time, then disseminates within the extracellular compartment (i.e., the vascular and interstitial spaces); dextrose is distributed proportionately through both intracellular and extracellular compartments.

c. The normal and abnormal ways in which the body may lose fluids and electrolytes. This may be organized in the following ways:

(1) Daily metabolic requirements. This is the daily minimum requirement for the average adult:

(a) 1500cc D5W.

(b) 500cc NS.

(c) 40 meq k^+.

(2) Deficit. Abnormal losses of fluids and electrolytes that have occurred prior to the patient arriving under your care.

(3) Replacement. The abnormal fluid and electrolyte losses that occur while the patient is under your care. Abnormal losses are usually replaced with standard solutions:

(a) Upper GI losses replaced liter for liter with NS.

(b) Lower GI losses replaced liter for liter with NS plus 44 meq. Sodium bicarbonate and 10 meq k^+ per liter.

(c) Excessive sweating replaced liter for liter with one-half Dextrose and one-half NS.

(4) Fluid and electrolyte problems are approached with three major considerations:

(a) How dehydrated is your patient (mild, moderate, or severe)?

(b) How did the dehydration come about (diarrhea, vomitus, or lack of intake of DMR)?

(c) How do you replace your calculated fluids and electrolytes?

(5) In calculating the extent of dehydration, the clinical state of dehydration (mild, moderate, or severe) corresponds to a percentage of total body weight lost: five percent of total previous body weight lost is mild; ten percent of total body weight previously lost is moderate; fifteen percent of the total previously body weight lost is severe.

(6) The following changes occur with dehydration:

(a) The skin becomes doughy and fails to spring back if picked up an released. Pressure marks, as from laying in bed, will not be present.

(b) Oral and anal mucous membranes become dry and do not glisten.

(7) Greater than five percent dehydration results in increased heart rate, decreased blood pressure, lethargy or semi-coma, and vomiting.

2. Over hydration with saline:

a. Edema appears in dependent areas like feet or over the sacrum if bed patient when the patient is five percent over hydrated with normal saline.

b. We also keep in mind that one liter of body fluid weighs approximately 2.2 poiunds or 1.0kg. By combining information gathered from history and physical examination, we are able to determine the extent of dehydration and the main factors involved in its production. This information then allows us to calculate the total amount and kinds of fluids and electrolytes needed to correct the defects. Once the total amount is known, then one-half of this total is given in the first eight hours and the other one-half given over the next 16 hours. We must take the precaution; however, of withholding potassium replacement until adequate urinary output (30cc +/hr) is assured.

c. For example, a middle aged Pakistani woman is brought into your dispensary delirious and semi-comatose. Her relatives tell you that 24 hours ago she experienced a sudden onset of vomiting and cramping abdominal pain. After the first several hours, the vomiting stopped and was replaced by a profuse amount of constant diarrhea with no pus or blood. She has been unable to take any food or fluids by mouth for the past 24 hours. Your physical examination reveals a delirious woman with a minimally elevated temperature; a rapid, weak pulse; very low blood pressure; and a rapid respiratory rate. Her eyes are sunken, mouth pinched, lips parched, tongue dry and shriveled, skin turgor is very poor, and mucus membranes bone dry. Her abdomen is flat and non-tender. Bowel sounds are greatly increased.

(1) You estimate that this woman must have weight approximately 100 pounds before she became ill.

(2) You are informed that prior to this episode that this woman appeared to be in excellent health.

(3) Your diagnosis is cholera associated with severe dehydration.

(4) The treatment of this woman will include tetracycline, general nursing care, and public health measures; but we shall limit our discussion to the treatment of her fluids and electrolyte abnormalities.

(a) Deficit. This woman is severely (15 percent) dehydrated. In relation to her prior estimated weight, this amounts to 15 pounds or approximately seven liters. Two liters of this amount comes from a total lack of intake of the previous days DMR (1500 D5W; 500cc, NS; plus 40 meq potassium). Of the remaining five liters deficit, it is estimated that one liter of vomitus and four liters of diarrhea. Replace vomitus liter for liter with NS and diarrhea liter for liter with RL or NS to which is added 10 meq. Potassium and 44 meq sodium bicarbonate.

(b) Replacement. Knowing the general course of cholera, it is expected that the diarrhea will continue for another two or three days; but, with tetracycline, the volume of diarrheal fluids lost by one-third to one-half can be cut. It is estimated four liters were lost in diarrhea the previous 24 hours. This will be replaced with the same solution used to replace diarrheal losses mentioned above.

(c) Daily metabolic requirement. Use our standard 24 hour value - 1500cc D5W and 500cc NS plus 40 meq potassium.

d. In summary, the following fluid and electrolyte are required:

(1) Deficit. Total = 7 liters.

	D5W	NS	meq	MEQ
DMR	1500cc	500cc	k^+	$NAHCO_3$
Vomitus		1000cc	40	
Diarrhea	_____	4000cc	40	156 from 44/ Lx4L
	1500cc	5500cc	80meq	156meq

(2) Replacement. Total = 2 liters. This is the amount of diarrhea she will lose in the next 24 hours.

Diarrhea	2000cc	20	88

(3) DMR. This is the normal metabolic requirement she will need for the next 24 hours.

	1500cc	500cc	40	
TOTALS	3000cc	8000cc	140meq	244meq

e. Of this total fluid requirement, one-half is given in the first eight hours, the other one-half over the following 16 hours. Potassium replacement will be withheld until adequate urine output is assured (30 + cc/hr), and then replaced at the rate of 10meq/hr. Sodium bicarbonate may be replaced immediately at the rate of 44 meq/liter.

(1) Total fluid = 3000 + 8000 = 11,000cc; $\frac{11{,}000 \times 1/2}{\text{1st 8 hours}} = \frac{550\text{cc}}{\text{1st 8 hours}}$.

(2) $\frac{550\text{cc}}{8\text{ hr}} = \frac{550\text{cc}}{8\text{ hr}} \times \frac{60\text{ min}}{\text{hour}} = \frac{550\text{cc}}{480\text{ min}} = \frac{1.2\text{cc}}{\text{min}}$; 1cc = 20 qtts.

(3) $\frac{1.2\text{cc}}{\text{min}} \times 20$ qtts/cc = 24 drops/minute.

(4) Almost all patients will require at least 11 liters in the first 24 hours and 15 to 20 liters is not uncommon. In an epidemic, start all the patients on NS at 30 qtts per min stat then go back and calculate the amounts that will be needed, give tetracycline and bicarbonate.

XVII. BURNS.

A. Causes of Burns:

1. Loss of protection.

2. Susceptability to infections.

3. Loss of body fluids.

B. Burns are Classified By Amount of Area Burned and Depth of Burn.

C. Estimating Percent of Burn:

1. Rule of Nine's:

a. Head, nin percent.

b. Arms, nine percent.

c. Upper trunk:

a. Anterior, nine percent.

b. Posterior, nine percent.

d. Lower trunk:

a. Anterior, nine percent.

b. Posterior, nine percent.

e. Perineum, one percent.

f. Thigh, nine percent.

g. Leg, nine percent.

2. Only second degree and third degree burns are estimated for replacement of fluids.

D. Depth of Burn:

1. First degree. Epidermis is destroyed and is red, painful or itchy, and has no blisters.

2. Second degree. Affects dermis. In second degree and worse, plasma is lost due to edema, blisters and weeping; and RBCs are lost. The skin is red, has painful blisters, marked by swelling, and heals in two weeks with no scars.

3. Deep second degree. Same as superficial, but also has numb areas. Heals in one month, may scar.

4. Third degree. Subcutaneous tissue destroyed and appears charred or pearly white, heals very slowly (one-eighth inch per week) and results in scars.

5. Fourth degree. Segmental charring, complete necrosis, and usually requires amputation.

E. *Burn Therapy:*

1. Immediate cooling of first degree and second degree burns with ice water will reduce damage.

2. First degree. Local anesthetic prn.

3. Second degree or worse:

a. Maintain airway. Suspect obstruction with face and neck burns due to swelling. Keep tracheotomy tube ready. Suspect chemical pneumonitis from inhalitation. Listen to chest. Lower patients head to prevent aspiration with vomiting.

b. Watch vital signs and treat for shock.

c. Analgesics prn.

d. Foley catheter in severe cases and especially with perenial burns.

e. Tetanus toxoid.

f. Antibiotics. Organism is usually B-strep; cover patient with penicillin and streptomycin or broad spectrum. Best to use penicillin x five days and stop if no infection.

g. Local skin care:

(1) Wash daily with mild, soapy solution.

(2) Debride only loose or charred tissue.

(3) Do not break blisters as they offer some protection against infection.

(4) Apply moist saline and furacin impregnated or dry dressings to the wounds b.i.d.

(5) Burns of the face and perineum are not covered with dressings and are left open to the air.

h. IV therapy. Use in any patient with 20 percent or greater burn of 2° or worse; in lesser burns use oral fluids. Burns cause the loss of large quantities of plasma. Use the burn formula for calculating fluid replacement. Estimate total percent area of second, third, and fourth degree burns. The maximum percent of total area burn to use in this formula is 50 percent.

4. First 24 hours treatment:

a. Colloids. 0.5cc x patients weight in kg x percent burn.

b. Electrolytes. 1.5cc x weight in kg x percent burn.

c. D5W. 2000cc. Give as follows:

(1) One-half of total calculated fluids in first eight hours.

(2) One-fourth in second eight hours.

(3) One-fourth in third eight hours.

(4) If sodium bicarbonate is available, 40 meq (1 ampule) in each fluid liter x 3, reduced acidosis; then follow with 40 meq for each 4 liters of fluid.

d. Give evenly over the second 24 hours:

(1) One-half of calculated colloids.

(2) One-half of calculated electrolytes.

(3) 2000cc D5W.

e. Third 24 hours:

(1) Give fluids orally if patient is capable.

(2) If patient is not capable give 1500cc D5W and normal saline (500cc).

Example: #176 man with 50 percent burns. $\frac{176\#}{2.2\#/kg}$ = 80 kg.

Colloids:

.5cc x 80 x 50 - 2000cc dextrose (24 hour total).

Electrolytes:

1.5cc x 80 x 50 - 6000cc normal saline or Ringer's lactate.

D5W = 2000cc D5W.

First eight hours: 1000cc Colloid
3000cc Saline
1000cc D5W

Second eight hours: 500cc Colloid
1500cc Saline
500cc D5W

Third eight hours: Same as second eight hours.

XVIII. CARDIO-PULMONARY.

A. Heart:

1. Angina pectoris:

a. Definition. A pain in the chest with definite characteristics and indicating cardiac disease. Usually occurs with exertion.

b. Etiology. Insufficient oxygenation (i.e., blood supply) to the heart muscle due to narrowing of the coronary arteries.

c. Symptoms. Crushing left chest pain radiating into the left arm. The pain is usually the result of anxiety or exercise which is relieved by rest, oxygen, or sublingual nitroglycerin. The pain is not sharp or knife-like in character and does not occur with each inspiration.

d. Treatment:

(1) Rest, sedation, and reassurance.

(2) Oxygen if symptoms are severe and remain more than a few minutes.

(3) Patient may have nitroglycerin tablets on his person. Dosage: One tablet of 1/100 to 1/200 grain nitroglycerin dissolved under the tongue.

2. Myocardial infarction ("Heart Attack"). Angina pectoris is a symptom of heart disease; myocardial infarction implies that there is actual death of cardiac muscle. Angina pain is usually short term and disappears on rest or with the simple treatment outlined above. The pain of myocardial infarction (which is much the same as angina pectoris) is generally more severe and associated with certain other signs and symptoms. Myocardial infarction may occur at rest or during sleep.

a. Symptoms. Essentially the same as angina pectoris, but often more severe and may be associated with the following:

(1) Extreme dyspnea.

(2) Extreme anxiety and a sense of impending doom.

(3) Increase, decrease, or irregularity of pulse.

(4) Perspiration.

(5) "Shock look" (ashen, cool, and perspiring forehead).

(6) Possible drop in BP, often to shock levels.

b. Treatment:

(1) Calm patient, administer morphine or demerol. If patient is in extreme pain, IV administration, slowly, may be necessary. Do not give analgesics if patient is in shock and none should be given if the respirations are below ten per minute.

(2) Oxygen by mask or tent is preferable to nasal oxygen.

(3) Absolute bed rest. One of the prime considerations is relieving the pain and anxiety associated with heart attacks. If pulse, respiration, and BP are not markedly abnormal and the patient is extremely anxious, experiencing much pain; the liberal use of demerol or morphine is indicated. It may be repeated at two to three hour intervals as long as respirations are 12 per minute or more and no other contraindications exist.

(4) Hospitalize. The treatment of myocardial infarction is long term and will require hospitalization for most patients. The recovery period will range from weeks to months.

XIX. HEAT INJURIES.

A. Introduction. Heat injuries are caused by excess environmental heat applied to the body. There are six other factors which will influence this condition:

1. Temperature of air and surrounding objects.

2. Humidity and air movement.

3. Clothing.

4. Activity Body heat loss or gain is regulated by the hypothalamus located in the cerebellum which makes adjustments to temperature changes of the blood. The hypothalmus also receives sympathetic impulses from the skin, blood vessels, muscles, and sweat glands. The body has core temperature (the temperature of the internal organs) and shell temperature (the temperature of external parts such as the skin). The shell temperature is always at least one degree lower than the core temperature. The three main ways of losing heat from core to shell are cardio-vascular, respiration, and perspiration.

B. Factors to Increase Body Resistance to Heat Injury Are:

1. Replacement of lost salt and water.

2. Good physical condition.

3. Reduced exposure, especially during the hottest part of the day.

4. Gradual troop acclimatization.

C. Specific Clinical Manifestations:

1. Heat cramps. This is due to loss of both water and sodium chloride, but with only water being replaced.

a. Clinical signs of this disorder are cramps in the voluntary muscles; cool and wet skin; and the temperature, pulse, and blood pressure are normal, but respirations are increased. Repeated episodes may take place in different muscles. The hematocrit will be elevated.

b. Treatment is salt water replacement:

(1) One or two liters of 0.1-0.2 percent solution of NaCl is given po. It can be given IV in severe cases.

(2) Give one or two liters of normal saline in a 30 minute period.

(3) The patient should rest for the remainder of the day if possible. A 0.1 percent NaCl solution is made by adding two salt tablets to a full canteen of water, or by adding one-third pound salt to a 36 gallon lister bag.

2. Heat exhaustion. This is due to a loss of both water and NaCl in the body.

a. Clinical findings are:

(1) Headache, weakness, and vertigo.

(2) Mental confusion and loss of coordination.

(3) Vomiting and syncope.

(4) Dilated pupils with blurred vision.

(5) Temperature 100/110F.

(6) Low blood pressure, rapid pulse, and slow respiration.

(7) Skin will be pale and wet, but not hot.

(8) Hematocrit is elevated.

(9) The urine specific quality is elevated.

b. Treatment. Loosen constricting clothing, put in cool or shaded area, rest, and replace loss with one to two liters of 0.1 percent NaCl solution either po or IV.

3. Heat stroke. This is due to a failure of the hypothalamus following exposure to a hot environment and resulting in high body temperatures. This disorder is a medical emergency. If the patient is not treated, death will result in one to two hours.

a. Clinical findings:

(1) Prodromal symptoms of headache, nausea, and vertigo.

(2) Followed by anhidrosis (cessation of sweating) with sudden onset of unconsciousness, delirium, or convulsions.

(3) Incontinence of urine and feces.

(4) Cyanosis.

(5) Temperature from 105°F up to 112°F.

(6) Pulse is rapid and bounding.

(7) Respirations are rapid and weak.

(8) Skin is hot, red, and dry.

b. Treatment. The main concern is to lower the body temperature which is life saving and must be done immediately.

(1) Cool patient until his temperature is 100-101°F then stop and be prepared to raise if it falls low. Giving 25mg of Thorazine IV will help to lower the temperature. Try to regulate it between 97-100°F.

(2) Take vital signs every ten minutes, treat shock in the normal fashion, and evacuate.

(3) Due to the fact that the hypothalamus has been damaged, these patients should be restricted from hot or cold areas afterwards because their bodies cannot regulate their own temperatures.

XX. DERMATOLOGY.

A. Definitions:

1. Macule. A flat, nonrasied area of coloration or discoloration of the skin (freckle).

2. Papule. A small, well circumscribed area of skin that is slightly raised (goosebump).

3. Vesicle. A small, well circumscribed area of skin that is raised and contains a clear fluid (fever blister).

4. Bulla. A large vesicle.

5. Wheal. A slightly elevated, flat topped, smooth area of skin that is either redder or paler than the surrounding skin (insect bite).

6. Excoriation. The loss of the superficial layers of skin as in scratching of the skin.

7. Erythema. A reddening of the skin.

8. Roseola. Any rose colored rash.

9. Lichenification. Thickening of the skin with accentuation of the skin markings.

10. Pruritis. Itching.

B. Skin. The largest organ of the body is the skin. Because of its size and location it is subjected to injury both from diseases within the body and injury from the outside environment.

1. Questions to be asked in the history include:

a. Where did the lesion first appear?

b. How did it spread?

c. Are the lesions seasonal?

d. Are the lesions affected by sunlight?

e. Is the patient on any medication?

f. Does the patient have contact with other persons with similar lesions?

2. Geographic History. An individual who spends some time in a tropical climate may have a disease unique to the tropics, but now is located in a temperate area.

3. Environmental history. The environmental history is also important as seen by callouses on workmen; patch of pigmented, thickened skin on the neck in violin players; skin cancer on sailors; and straie over hypertrophied muscle areas in body-building fanatics.

4. Physical examination. Be sure you look over the whole body for lesions, not just the lesion the patient shows you. Except in the most obvious diagnosis, do a rapid but complete physical. Calling a skin eruption papular and using calamine lotion may not hurt the patient with measles, but leaves something to be desired in the patient with typhoid fever.

C. Dermatitis. Inflammation of the skin.

1. Contact dermatitis. The most common type of dermatitis resulting from skin contact with an irritant or an allergic agent. The irritants may be alkalis or acids, and the allergic agents may be animal or vegetable. At the site of contact the patient develops an initial erythema or redness followed by vesicle formation, rupture of vesicle with discharge of the material onto the skin, and finally healing of lichenification of the lesion. The number of possible allergic agents or irritants is nearly uncountable ranging from the nickel in coins to the alkalai in soap to the irritants in poison ivy. The treatment of choice in mild cases is to remove the offending agent. If pruritis is severe, apply an antipruritic solution like calamine lotion or benadryl 50mg po q.i.d. Temaril, 2.5mg q.i.d. po, is also an excellent prn pruritis. More than moderate involvement can be treated extremely effectively with a steroid ointment applied b.i.d. When the involvement is very severe; i.e., face and eyes, and the diagnosis positive: prednisone 5mg given in the following dosage will be rapidly effective (called a "steroid burst"):

a. Two 5mg tablets po q.i.d., first day.

b. Two 5mg tablets po t.i.d., second day.

c. One 5mg tablet po q.i.d., third day.

d. One 5mg tablet po b.i.d., fourth day.

e. Due to the potential danger of steroid medication the above treatment schedule should be used only in those cases in which the above criteria are met.

2. Seborrheic dermatitis. This is another very common condition which may be acute or chronic and occurs on the scalp where it is commonly known as dandrugg. It is called marginal blepharitis on the eyelids.

a. Appearance. Its appearance may be in either two forms depending on the activity of the sebaceous glands.

(1) It may be manifest by excessive oiliness, greasy scaling, or by dry scaling.

(2) Either of two forms may be associated with erythema, especially if secondary bacterial infection occurs.

b. Treatment. Depends on the extent of the condition. Selsun shampoo is quite effective in treatment of dandruff. Any other area can best be treated by a cream containing .5 percent hydrocortisone and 10 percent sodium sulfacetamide. General principles of treatment include:

(1) Eggs and chocolates should be excluded from childs diet.

(2) Breast feeding should be encouraged in infant with this condition.

(3) The infant must not be vaccinated until skin is clear for at least one year.

(4) Antihistamines such as benadryl and temaril may be useful for the itching.

(5) For the acute inflammation Burrow's solution, soaks may be used.

(6) Topical steroid creams may be used unless infection is not controlled.

(7) For acutely inflammed lesions oral antibiotics should be used.

c. Differentiation. Length of response will help differentiate this condition from atopic dermatitis, a condition that appears in early months of life usually in those children who have strong family history or similar allergic disorders as asthma, hay fever, and atopic dermatitis.

d. Characteristics. The disease is usually vesicular, papular, exudative, and extremely pruritic in the acute stage; but its hallmark is the development of lichenification.

3. Impetigo. This is a common bacterial skin infection involving superficial layers of the skin and is seen most commonly in children involving the face or lips. The causative organism is usually streptococcus and occasionally staphylococcus. The lesion is characteristically a thin-roofed pustule which breaks early to form shallow ulcer craters weeping a yellow fluid. This crusts over the craters to form a characteristic yellow-brown crust which looks honey colored. This crust material is filled with bacteria and thus the infection is prone to spread. Treatment includes warm phisoHex soaks to remove crusts and topical antibiotics to involved areas. If involvement is severe, oral penicillin 250mg po t.i.d. for seven days may be used.

4. The furuncle or boil is a staphylococcus infection of the hair follicle and appears as a pustule of varying size. Carbuncles are multiple connected furuncles, warm soaks and I+D are usually performed; but due to extensiveness of the lesion, penicillin and tetracycline are also given. Treatment is warm soaks to encourage drainage if drainage does not occur spontaneously, the furuncle should be incised (except the face) and drained. When multiple furuncles are present, use a systemic antibiotic such as tetracycline 250mg po q.i.d. for seven to ten days.

5. Cellulitis is a bacterial infection of the skin with a deeper layer involved, usually caused by streptococcus. The organism gains entry through a wound or a chronic infection may precede the acute spreading infection. There are usually symptoms of systemic infection as fever and chills. The area involved is usually an extremity, but any area may be involved including the face where it is called erysipelas. The prompt administration of procaine penicillin 600,000 u IM b.i.d. or oral penicillin 250mg t.i.d. po is the primary treatment. Symptomatic treatment, bed rest, ASA for fever, and adequate fluid intake should also be used.

D. Viral Diseases:

1. Herpes simplex, fever blister or cold sore, usually occurs around the lips although other areas of the body may be involved. A common herpes infection occurs on the genitals in males and females usually transmitted by intimate contact, and must be differentiated from a more serious venereal disease. The principal lesion of herpes simplex is a vesicle, or an erythematous base which may break down to form an ulcer. The usual symptom associated with this condition is a burning sensation. Spontaneous healing occurs in five to eight days and no treatment is indicated. Although zinc oxide ointment may be applied, the disease is recurrent. It erupts after any diverse body changes as fever, menses, GI upset, or sunburn. Sun filters like R.V.P. and AFILE may be used in prevention if sun causes this problem.

2. Herpes zoster. This virus is identical to the one causing chicken-pox. The characteristic lesion is a group of vesicles occurring in a dermatome. It starts in the skin at the spine and then travels anteriorly in the intercostal spaces of the chest. Prior to the eruption, for several days there may be pain in the area that will be involved. The disease lasts several weeks and the primary symptom is pain. Pain may remain for prolonged periods following regression of the skin lesion. Treatment is to alleviate pain by using least potent analgesic which is effective. In the young, ASA or codeine is usually effective. In the older age groups, codeine and stronger analgesics will be necessary.

E. Superficial Fungal Infections. These infections are very common and represent a large proportion of skin problems in hot humid environment. Although there are three major types of fungal organisms which cause these varying conditions, for our purpose they are all grouped together. Superficial fungal infections are classified by the general term "Tinea" followed by the specific area of the body involved.

1. Tinea capitis. This is ringworm of the scalp which clinically varies from scaly patches resembling seborrhea to patchy scaling areas of baldness with broken hairs. The treatment of choice is Griseofulvin 250mg po q.i.d., a potent oral antifungal agent. Treatment may require several weeks in very severe cases.

2. Tinea corporis. This is ringworm of the skin. The lesion is a round or oval erythematous patch which spreads outward as the center clears.

a. Identification. As in all tineas, the diagnosis can be verified by doing a KOH preparation and seeing the characteristic hyphae.

b. Treatment. The treatment varies according to the extent of involvement. If small areas are involved, local application of tinactin b.i.d. is excellent. Other antifungal ointments such as Whitfield's ointment, desenex, or fungizone can be used interchangeably. Rarely (with marked involvement) griseofulvin will be used.

3. Tinea cruris. This is ringworm of the groin which closely resembles tinea corporis. The infection remains localized to the inside portion of the thigh and the fold. The scrotum is not involved. This classical lesion can be altered by secondary inflammation which occurs commonly. Treatment is the same as for tinea corporis, although steroids are often used in addition for those cases with secondary inflammation.

4. Tinea pedis. This is everyday athlete's foot. Fissuring of the skin, small vesicles, and even maceration are the common appearance. Treatment is local with any of the antifungal lotions. Griseofulvin will not usually work as a permanent cure, but should be used in acute severe cases.

5. Tinea versicolor. This differs somewhat from the previously mentione tineas. It is usually asymptomatic although mild pruritis may occur. The characteristic small macules appear white when the patient tans, since the involved areas will not tan. It usually appears on the chest, legs, and back. Treatment is often not indicated, but if for cosmetic reasons or mild symptoms one does treat, the drug of choice is tinactin or selsun. Griseofulvin is not effective.

F. Lice. Two species of lice produce infestation of the scalp, body, and pubic area in man.

1. Pediculosis capitis. This is a chronic infestation of the scalp, hair, and occasionally the eyelids by the human louse. The organism lives in the hair and lays its characteristic nits (eggs) which can be seen firmly attached to the scalp hair. It feeds on blood, producing small blood crusts on the scalp and usually a small, intensely pruritic papule. Secondary infection commonly occurs. Treatment is with kwell cream; one application at night followed by a shampoo.

2. Pediculosis corporis or Vagabond's disease. This body louse lives in the patient's clothing, lays its eggs, and feeds on blood. The area of skin that is bitten may have a blood crust, but more characteristic are the linear scratch marks due to the extreme pruritis. Treatment is to apply DDT to the patients clothing and possessions such as blankets followed by disinfection of these items. This condition is rare in Negroes.

G. Pediculosis pubic or crabs. This disease has traditionally been a sociological fingerprint marking society's refuse - the vulgar, promiscuous, and unwashed. The crabs live in the pubic hairs where it discharges its very small nits. The crabs live on blood giving rise to the chief lesion, i.e., scratch marks due to intense pruritus. Positive diagnosis usually requires a hand lens due to its small size. Treatment is one application of kwell cream thoroughly washed off after 24 hours.

H. Jock Itch. This is most often caused by wet heat and tinea cruris or yeast. Usually presents itself as a sharp margined maculopapular erythematous base rash with satellite lesions. It can usually be prevented or diminished by surgical soap, powder, not wearing under clothes, and air drying. Treatments. Try one method and switch if it doesn't work.

1. Tar compound and mycolog.

2. Iodine, one percent.

3. HCA, .5 percent with vioform, three percent.

4. Tinactin q.i.d.

5. Whitfield's ointment.

6. Tannic acid (concentrated tea).

7. Burrow's solution, prn weeping severely.

I. Common Treatment. In treating skin disease one axiom is "if wet, dry it; if dry, wet it". The heavier the preparation you place on the skin the wetter will be the result; e.g., dry scaly lesions are treated with cream or ointment while weeping lesions are treated with liquid solutions. Steroids are incorporated to decrease inflammation and antibiotics or antifungals are included to destroy the etiologic agent or a 2^{o} invader.

1. Solutions:

a. Potassium permanganate (purple) 5 gr tab/1 liter water; astringent, antipruritic, antiseptic.

b. Sluminum acetate (Burrow's solution) T tab/100cc water astringent.

c. Tinc of benzoin ("tough skin").

d. Poison ivy, poison oak sol (phenol - formaldehyde) antiprutitic - astringent, apply prn.

2. Lotion. Calamine lotion q.i.d. or prn; soothing, drying. Tinactin, oily antifungal, b.i.d.

3. Creams. Rose-water ointment "cold cream". More softening and soothing than ointment. Mycolog, steroid, and antifungal plus antibacterial. Apply q.i.d.

4. Ointment:

a. Petrolatum, hydrophilic (traps moisture in a dry skin).

b. Whitfield's (benzoic acid plus salicylic acid) use b.i.d., antifungal.

c. Desenex ointment, antifungal, also available as lotion for weeping lesions.

d. Kwell, gamma benzene, scabicide.

e. Hydrocortisone ointment (HCA) available in .25, 1.5, 1 and 2.5 percent b.i.d., anti-inflammatory.

f. Coal tar preparations, subacute dermatitis, use qhs, wash in AM.

g. Pragmatar, coal tar, sulfur, salcylic acid; subacute dermatitis, antifungal, apply t.i.d.

XXI. COLD INJURIES.

A. General. A cold injury is tissue trauma produced by exposure to cold. The specific type of injury depends upon the degree of cold to which the body is exposed, the duration of the exposure, and the environmental factors. Cold injuries can occur at any temperature less than 50°F. The cause of cold injury is loss of body heat through conduction, convection, radiation, and evaporation. Other factors are inactivity and wet, tight clothing. Tight clothing prevents adequate circulation and does not allow for air pockets between clothing layers. Clothing should be loose and worn in several layers. People over 40 and under 17 are more susceptible; the former because of decreased circulation and the latter because they do not follow instructions. Fatigue, operations at high altitudes, and race are other predisposing factors.

B. Types of Cold Injury:

1. Chilblains. A superficial cold injury to the skin without freezing of tissue. It usually occurs on exposed areas of the body at temperatures between 50-32°F and can be the precursor of frostbite. There may be an itching sensation, redness of the skin, and the area will feel cold to the touch. The treatment is rewarming such as placing the hands in the axilla or firm gentle pressure by warm hands.

2. Trench foot. This is due to prolonged exposure to moisture and temperatures between 50-32°F. It is a more severe form of immersion foot. Three components are necessary here; wet, cold, and time, usually 3-14 days. The toes are usually affected but the heel and ball of the foot can also be involved.

a. Signs and symptoms include lack of sensation, a heavy wooden feeling, feels cold, and skin may be pale blue to gray in color, shriveled, and wrinkled. With rapid rewarming there is pain and inflammation and edema. From 3-14 days after injury, the area becomes hot and dry and the swelling increases. The area turns gray and blisters, then black, and finally sloughing of tissues. Also recurring pain, sweating, and possible loss of digits.

b. Treatment. Treatment should be carried out at a base area if possible. Dry and warm extremity in room air. The remainder of the therapy is similar to frostbite.

3. Frostbite. This results from crystallization of tissue fluids in the skin or subQ tissue, produced by exposure to temperature of 32°F and below. Frostbite can be differentiated into two types.

a. Superficial frostbite. The skin will be without sensation; but will be soft, resiliant, and waxy white. Rapid rewarming results in numbness and a burning sensation which will last for months. Blisters will occur in 24 - 36 hours which will dry and turn black in about two weeks. Skin and tissue will slough off and the area will remain sensitive for years. After initial healing, the skin will appear red and then perspire freely.

b. Deef frostbite. There is no sensation except a heavy wooden feeling and the tissue is hard and appears waxy white. Rapid rewarming results in massive blistering in three to seven days and massive edema which will last for months. The blisters slough off. If the bone is involved, it can result in infection requiring surgery. Treatment consists of:

(1) Movement to a warm area.

(2) Rapid rewarming for the part by immersion in water at temperatures of 108-112°F or 42-44°C. If the affected part has already started to thaw, do not rewarm the area rapidly. It is simply dried and left open in warm room air. Do not add water over 115°F during rapid rewarming. Do not attempt to rewarm by exercise or rubbing and never apply snow to a frozen extremity.

(3) Alcohol should not be given as it causes arteriolar dilation and further loss of heat. Smoking is prohibited as it causes vasoconstriction of deep vessels and inhibits rewarming. Give hot soup or broth.

(4) If blisters should rupture leaving open areas, they may be covered with dry sterile dressing.

(5) Cotton may be placed between the digits to reduce friction. Wash area daily with a mild soap solution.

(6) Analgesics for pain, tetanus toxide. Broad spectrum antibiotics can be used to prevent infection.

(7) Do not debride the area.

(8) In cases where there is a fracture in the frostbite area, do not use traction. Immobilize after rewarming, but splint must be very well padded and be sure not to impair circulation.

XXII. CHEST DISEASES.

A. Acute Bronchitis. Usually gm (+) bacteria or viral etiology. Symptoms are present in whooping cough, flu, typhoid fever, and ten day measles. Any portion of the respiratory tree can be inflammed due to chemical irritant like smoke.

1. Signs and symptoms:

a. Hacking cough which may be productive and painful.

b. Fever, headache, and malaise.

c. May have loud scattered rales (called rhonchi).

2. Treatment.

a. Pen or tetracycline for seven days for bacterial etiology, ASA, and expectorants; e.g., glycerol, guiacolate, Brown's mixture, prn. Expectorants cause increased sputum production, but of a thinner nature and easier to cough up. They don't stop the cough.

b. Increased fluids, over three liters per day in an adult, give IV if patient cannot take po.

c. Codeine. 32mg every three hours po. Use to decrease only when the cough is so frequent that it is harming the patient.

B. Chronic Bronchitis. "Smokers cough."

1. Signs and symptoms:

a. Chronic, painless cough; productive only with 2^{o} bacterial infection.

b. May progress in years to asthma or emphysema.

c. No fever unless infected.

2. Treatment consists of not smoking and treating 2^{o} infections like acute bronchitis.

c. Pneumonia. Pneumonitis usually gram (+) bacterial esp Pneumococcus or viral, infection of alveoli.

1. Signs and symptoms:

a. Prodrome: malaise, coryza, and headache.

b. Productive cough, yellow green blood tinged sputum (called "rusty").

c. Chills, fever, and increased pulse rate (PR does not elevate as high with viral etiology).

d. May have pleuritic chest pain, a knife like pain with chest movements, may cause "splinting". May have increased breathing rate or dyspnea. Rales will be present.

e. Tactile fremitus, may be increased with consolidation and decreased at areas of pleural effusion. Percussion dullness may be present at consolidated areas near the chest wall.

2. *Treatment.* Same as for acute bronchitis, but with more vigor and support since the mortality is much higher. Pulmonary TB can generally be differentiated from bacillary pneumonia by the slow onset, chronic disease appearance, low fever, less productive cough, and apical location of the rales.

D. Asthma. Constriction of the bronchioles as an allergic response. Frequent F.H. or P.H. of allergic disease including asthma, chronic nasal allergy, hay fever, and skin allergies.

1. Signs and symptoms:

a. Wheezing and generalized dyspnea.

b. May come on slowly or begin acutely.

c. Inspiration time longer than expiration, patient cannot get the air past the obstructed bronchioles. Wheezing most pronounced on expiration.

d. Patient may appear anxious and may sit up and use accessory muscles of respiration. Look for retracted inter-costal spaces. Scattered rales heard occasionally.

2. Treatment:

a. Reassure patient that you know what is wrong and can help him.

b. Epinephrine 1:1000 SQ 0.3cc every 15 minutes not more than four times (use 0.2cc for children).

c. If patient on first injection responds well, either give repeat epinephrine injection or epinephrine in oil 1:500, 0.5cc which lasts longer.

d. Give tedral tablets po q.i.d., a broncho dilator. Use tedral daily prn for chronic asthma.

e. Give sedative; e.g., phenobarbital 32mg q.i.d. if patient has significant anxiety.

f. Force fluids.

g. Amminophylline suppositories 500mg qhs, lasts six hours.

h. Tetracycline if infection is present.

3. Refractory patient:

a. IV fluids either D5W or Saline, get patient well hydrated. Give the following in the IV or other routes depending on the drug available.

b. Amminophylline 500mg/liter.

c. Phenobarbital 64mg every four hours (or other sedatives).

d. Steroid; e.g., hydrocortisone 100mg q.i.d.

e. Tetracycline 250mg q.i.d.

f. O_2, if cyanotic.

4. If patient fails to improve with this regime after 24 hours it is called Status Asthmaticus. Try ether mixed with mineral oil or olive oil 1:1 per rectum up to 160cc total in the adult along with the previous treatment. In chronic asthma some patients use hand nebulizers with bronchodilators. These are discouraged because patient may become refractory to the drugs and then with severe attacks the treatment is less effective.

E. Emphysema. This is a disease of smokers with history of chronic bronchitis. The bronchi are changed such that air enters the lung and cannot completely escape. All symptoms increase gradually.

1. Signs and symptoms:

a. Dyspnea.

b. Increased chest size. Expiration time excedes inspiration time.

c. Decreased BS, tympany to percussion, and decreased tactile fremities.

d. Symptoms of chronic bronchitis present.

2. Treatment. Stop smoking. Disease does not decrease but does not progress further. Treat infections prn.

F. Tuberculosis. Caused by acid fast rod mycobacterium tuberculosis. Usually transmitted by inhalation of droplets with TB attached, but can be passed on in human or cow milk. Due to the prevalence of this disease we are all repeatedly exposed to it. That is, we inhale the bacteria but they do not infect the tissues. Some individuals will become infected and the ppd skin test becomes positive. On this initial infection the bacteria is located throughout the lung tissue. About 95 percent do not develop active disease, but isolate the organism in the tissues. This isolated organism plus the hilar lymph nodes which react to the organism are called the primary or Ghon complex. If the body becomes debilitated some time in the future, it is possible for this initial infection to break through the isolation and become active disease although it is rare. On repeated exposure most individuals will simply fight off the bacteria and no further infection occurs. A few will become reinfected. These are the patients who develop active pulmonary TB. The individuals with active pulmonary TB usually run a progressive downhill course over long periods of time unless treated. They can further develop miliary TB; i.e., multiple foci spread from the lungs or scrofula; i.e., TB of the cervical lymph nodes manifest as a slowly growing cold slightly fluctuant painless anterior neck mass. Renal TB, TB meningitis, or vertebral TB can also occur.

1. Signs and symptoms. Adult pulmonary TB.

a. Most individuals will not show signs early in the disease. They must be checked by skin test or x-ray.

b. Malaise, lowgrade fever, and night sweats.

c. Cough with hemoptysis, anorexia, and emaciation.

d. SOB - late. Apical lung findings abnormal, usually rales, may have dullness, decreased BS.

e. Cervical or axillary lymphadenopathy.

2. Treatment. Only those individuals should be treated that the SF medic can guarantee will take the medicines regularly and faithfully for the many months required and who can be followed for this same time period by medical personnel. The danger of short term treatment is inadequate result plus development of bacteria resistance to these drugs. Patient on treatment should receive drugs for a minimum of one year and at least six months past the time active disease is gone. Persons bringing up bacteria in the sputum as evidence with acid fast stain should be isolated. Chest x-ray should be done every three months, while on treatment. Patients also require a good diet and extra rest.

3. Dugs. Streptomycin 0.5gm b.i.d. IM x 30 days, PAS 12gm po every day, and INH 100mg t.i.d. po.

4. Converter. A converter is an individual who in the known recent past had a negative ppd which is now positive. Converters should be checked with chest x-ray for active disease. If active disease is not found they should receive INH 300mg po daily (all three tablets at the same time) for one year and chest x-ray every three months during the year. A ppd (purified protein derivative) is positive when after 72 hours there is more than 10 millimeters of induration. The redness around the induration has no significance. A tine test may also be used for TB skin testing.

G. Pneumothorax. Air in the pleural space; i.e., between the visceral and parietal pleural rather than within alveoli. It may occur spontaneously with chest wounds or other diseases.

1. Signs and symptoms:

a. Pleuritic chest pain (knife like pain), tympany to percussion, and DOE.

b. Decreased BS upon auscultation and tactile fremitus.

c. Increased pulse and respiratory rate. May be in respiratory distress or cyanotic.

d. PMI or trachea may shift away from the air.

2. Tension pneumothorax.

a. General. This is the most severe kind of pneumothorax. In this situation, not only is air present in the pleural space; but it is under increased pressure and exerts a more detrimental effect. It may arise when a ball valve effect occurs. This allows air into the pleural space but does not allow its escape.

b. Treatment. The great majority of pneumothoracies will resorb without complications and the patient may need only to be observed at bed rest with support and mild analgesics. Usually seven to ten days for full resorption. Give O_2 if the patient is a severe distress. If a tension pneumothorax is present following a GSW as evidence by movement of the PMI and trachea with increasing dyspnea, then simply remove the airtight bandage over the tension area and allow air to escape periodically prn. If the pneumothrax is causing severe respiratory distress, perform a thoracentesis in the ant. Second ICS at the MCL:

(1) Insert a large needle attached to a large syringe (10cc is the smallest useable) via rubber tubing and using a hemostat as a valve in the tubing.

(2) Use local anesthetic and insert the needle immediately superior to the rib to avoid the intercostal artery.

(3) Remove air from the pleural space until no more is obtained.

(4) Remove the needle and bandage the area.

(5) Repeat aspirations can be done in a similar manner of the needle (or a noncompressible tube like IV tubing) may be left in place and hooked up to a water jug wherein the chest tube ends under water.

(6) When the patient coughs, the air is blown out the tube; but further air cannot enter through the water.

(7) Another method is to attach the needle to a rubber glove liner, balloon or "similar object" with a small hole cut into it. Air can be expelled out this "valve", but cannot reenter.

H. Penetrating Wounds of the Chest. If the patient survives the initial trauma, and the respiration and shock can be supported there is a good prognosis. Wounds into the chest frequently suck air into the pleural space. If the opening is smaller than the trachea, the situation is usually tolerated. Larger wounds cannot be maintained by the body alone since with inspiration more air is inspired through the trachea.

1. Signs and symptoms include dyspnea, cyanosis, and GSW.

2. Treatment:

a. Cover with a bandage as air tight as practical in the situation. Have the patient valsalva (try to expire with mouth and nose closed) just before placing the bandage to drive as much air as possible from the chest before closing the hole. If circumstances permit, when there is a visible large lung laceration leave a chest tube in the chest exiting under the bandage and attached to a water jug as previously described.

b. Debride and care for chest wounds like other soft tissue wounds except that the bandage should not be removed from a large hole into the chest until the patient is stable and can tolerate another pneumothorax which will occur when you debride and close the wound.

I. Rib Fractures. Due to trauma or severe cough.

1. Signs and symptoms:

a. Sharp pain at local area with respiratory movements.

b. Shallow, rapid breathing if pain is severe.

c. Tenderness, swelling, deformity, and crepitus may be present at fracture site, usually lasts only a few days at most.

2. Treatment:

a. Mild analgesics may suffice.

b. Tape the affected hemithorax for relief of pain. Do not tape completely around chest as it inhibits breathing.

c. With severe pain, intercostal nerve block may be done; i.e., 2-3cc local anesthesia into the intercostal tissue posterior to the pain and including two spaces below and above the painful area (may give relief for several days). Procedure can be repeated prn. Insert needle immediately above rib to avoid artery on inferior aspect of the ribs.

J. Flail Chest. Multiple broken ribs such that the chest cannot maintain its configuration with respiratory movements. Seen with heavy concussion near the chest or on hitting the steering wheel in auto accidents.

1. Treatment:

a. This is a medical emergency!

b. You must stablize the chest.

(1) Paradoxical breathing is present; i.e., with inspiration the chest wall moves inward rather than expanding.

(2) Stabilize wall by attaching the chest to some overhead structure. With the patient in supine position, attach a towel clip into the sternum and tie it to the ceiling or tree branch with IV tubing. Remember that with chopper evacuation you must guarantee that the chest will be stabilized en route so either insure the crew ties the chest to the ceiling or holds it in the air or rig the apparatus in the aircraft yourself.

K. Musculoskeletal Chest Pain. This is the most common cause of chest pain and the patients usually have a history of unusual exercise or trauma. Patients fear there is heart disease. You can rule out angina pectoris since muscle pain is not crushing in nature and angina is not a sharp pain which changes with respiration. Other lung diseases can be ruled out through lack of dyspnea or abnormalities in the P.E.

XXIII. GENITO URINARY SYSTEM.

A. Introduction. The urinary system excretes wastes and regulates the composition of the blood. Blood is presented to the kidneys via the renal arteries where it is filtered through small holes in the capillaries into the renal tubules which reabsorbs that which it does not want and allows the rest to drain out the ureters to the bladder. The capillary filtration site is called the glomerulus and it, along with its renal rubule, is called a nephron. There are over a million nephrons in each kidney. The various kidney diseases result from selective attack on those different portions of the urinary system and the signs, symptoms, and laboratory findings reflect the loss of the function of that portion of the kidney. For example: A filtration pressure of 70mm systolic blood pressure is necessary, to drive the blood through the capillaries at the glomerulus. If the blood pressure falls below this level, filtration stops and waste products in the blood increase. Therefore, much of our treatment of shock is based on maintaining adequate blood pressure and flow to the kidneys.

B. Diseases of the Kidney:

1. Glomerulonephritis. This is a hypersensitivity disease of the kidney secondary to a Group A-B hemolytic streptococcal infection elsewhere in the body, usually in the pharynx.

a. The infection usually occurs ten days to two weeks prior to renal involvement. The mechanism is similar to that occuring in acute rheumatic fever, in that the antecedent streptococcal infection somehow causes the patient to make anti-bodies against his own tissue, renal tissue in glomerulonephritis, primarily cardiac tissue in rheumatic fever. The end result is leakage of red blood cells and protein into the urine, abnormal filtration, and retention of fluid. Most of the signs and symptoms of the disease are due to appearance of abnormal constituents in the urine and retained fluid and wastes in the blood.

b. There is great variability in the clinical patterns of glomerulonephritis:

(1) The attack may be so mild as to be unnoticed or may be abrupt and severe; and high fever, severe headache, malaise, gross hematuria, oliguria or anuria, high blood pressure, and heart failure may result.

(2) In the average case, the child is not very ill and the presenting symptom is usually hematuria. Usually occurs in children and teenagers. The parents have usually forgotten the preceding strep throat. Puffiness about the eyes may appear with the hematuria. For the first few days the urine is grossly bloody, but usually not bright red. It then acquires a smoky dirty brownish hue.

(3) Edema especially of the face and eyes is common, but severe edema is not seen unless fluids have been forced in the presence of oliguria.

(4) The temperature varies considerably but it may be as high as 103-104°F for three to five days, then gradually falls to about 100°. About 70 percent of patients will have high blood pressure with resultant headaches and nose bleeds.

(5) Improvement, as seen by regression of symptoms, usually begins within one to two weeks and gross blood disappears from the urine. As a rule, blood pressure returns to normal after about a week.

c. Laboratory findings are proteinuria, hematuria, and oliguria.

d. The major complications of the disease are cerebral problems resulting from high blood pressure or cardiac failure in those with excessive fluid retention and chronic renal disease. The differential diagnosis includes sulfonamide overdosage, hemorrhagic cystitis, trauma, calculi, scurvy, shistosomiasis, and tuberculosis. Occasionally a glomeruolonephritis-type syndrome is seen in children with plasmodium vivax infection.

e. Treatment of the uncomplicated case is symptomatic and includes bed rest until hematuria disappears; a low salt, soft diet; and observation for the early diagnosis of complications. A blood pressure of greater than 95mm diastolic should be treated with reserpine .07 mg/kg IM, a single dose usually being adequate, although it may need to be repeated after 12 hours. Cardiac failure, oliguria or hypertension should be treated with fluid restriction to 350-500cc plus urine output and insensible loss, given as D5W per day.

2. Pyelonephritis. This is a bacterial infection of the kidneys and like most infections of the genito-urinary tract is due to gram negative bacteria ninety percent of the time. The disease may be acute or chronic; in approximately one-half the cases there is a predisposing obstruction as seen with stones or strictures. Instrumentation of the G.U. tract with catheters often leads to urethritis that remains as long as the catheter is in place.

a. Pyelonephritis is a disease of signs:

(1) Fever, pain, and shock tenderness in the angle between the last rib and the vertebral column (costo vertebral angle = CVA) are the cardinal ones.

(2) Often, a confirmatory sign is pain on raising the leg of the involved side from the supine position.

(3) Usually the bladder is either primarily or secondarily infected and symptoms of this occur.

b. Laboratory tests. They reveal greater than five white blood cells per high power field in G.U. infections, although localization within the G.U. tract is not possible by this criterion. If white blood cells casts are seen in the urine, this locates the infection in the kidneys. The urinalysis will also serve to rule out other causes of acute abdomen.

c. Treatment. In the treatment of pyelonephritis, the most important agents are antibiotics. Tetracycline or ampicillin 250mg q.i.d. po for 14 days is the treatment of choice. At the conclusion of therapy, re-examination of the urine should be done to demonstrate complete clearing of infection. If urinalysis reveals continued bacteruria (e.g. gantrisin), a second course of therapy with an alternate antibiotic should be undertaken. General measures such as bed rest, forcing fluids, and aspirin for fever should also be used.

3. Cystitis. This disease has the same causes as pyelonephritis and they often coexist. Unlike pyelonephritis, cystitis causes symptoms (those of bladder irritation). Included are urgency, frequency, nocturia, and dysuria. Important in distinguishing cystitis from pyelonephritis is the absence of fever in cystitis. Treatment is ampicillin or tetracycline in doses of 1gm per day, forcing fluids, and pyridium (one tablet t.i.d. po). Pyridium is a urinary analgesic which turns the urine red.

4. Acute renal failure. This disease results from sudden injury to the kidneys causing them to stop functioning.

a. Causes. The causes are numerous and can best be divided into three types based on anatomical location of the damage. These are pre-renal, renal, and post-renal. Pre-renal (shock, congestive heart failure,

dehydration, and myocardial infarction) includes all those causes of renal failure occurring before the blood reaches the kidney; renal (transfusion reaction, burns, and pyelonephritis) are those affecting the kidney itself; and post-renal (prostatic tumors and benign prostatic hypertrophy and stones) are those after the urine leaves the kidney.

b. Signs and symptoms:

(1) The cardinal sign of acute renal failure is sudden reduction in urinary output. Normal daily urine output is 1000 to 1800cc per day. With failure, daily volume may vary from 0 to 500ml/day. The fact that in a period of a few days to six weeks the renal function can be expected to return with proper treatment and that death may result in the untreated, makes it imperative that you recognize this disease and know its treatment.

(2) Anorexia, nausea, and lethargy.

(3) The symptom complex in the later stages is called uremia (wastes normally excreted accumulate in the blood). The symptoms include hypertension, nausea, vomiting, diarrhea, convulsions, somnolence, and coma.

(4) Management during this period will determine the clinical picture. Overhydration leads to edema and congestive heart failure. Failure to restrict potassium may lead to cardiac arrest. Prior to recovery the patient will enter a diuretic phase in which increased amounts of urine will be produced, up to several liters per day.

(5) It is important to distinguish uremia from two common problems that may mimic renal failure; dehydration and prostatic obstruction. In the former, rapid infusion of 500 to 1000cc of IV saline will restore blood volume temporarily and urine will be excreted. This will rule out obstruction. Catheterization will rule out prostatic obstruction due to hypertrophy. It may be difficult to pass a catheter past a large prostate. Suprapubic needle aspiration of the bladder may be necessary if it is markedly distended.

c. Treatment. Treatment of acute renal failure is twofold; specific and general supportive.

(1) Specific treatment refers to alleviating the basic cause of oliguria.

(2) General supportive measures include:

(a) Bed rest.

(b) Restriction of fluids to 500cc per day plus previous days output.

(c) Diet to be entirely glucose, 100gm per day to reduce the buildup of nitrogen products in blood from the break-down of protein.

(d) Restrict potassium by withholding potassium-containing foods such as bananas and citrus juices from the diet.

(e) Treat convulsions with either phenobarbital or amobarbital.

(f) Strict I+O and weigh daily (patient should lose one pound/day on this regimen, if he doesn't you are overloading him with fluids).

(g) When diuretic phase occurs do not fall behind in your replacement of fluid deficits.

(e) If acute renal filure should occur among one of your team members, evacuation should be first priority.

5. Prostatitis. This is an acute bacterial infection usually secondary to urethritis, although blood-borne infection from another focus may occur. Since the prostate gland surrounds the urethra, urinary retention from swelling of the prostate may occur.

a. Signs and symptoms. Fever, frequency, urgency, low back and rectal pain, pain on voiding, and occasionally inability to urinate due to obstruction. Physical exam confirms the diagnosis. Rectal exam (placing the finger on the anterior wall of the rectum) will reveal an exquisitely tender, swollen, and soft prostate gland. White blood cells greater than 5/hpf will be present on urinalysis. Occasionally, a purulent urethral discharge will also be present which should be gram stained, as prostatitis may be caused by gonococci.

b. Treatment.

(1) Tetracycline, if not due to gonococci, 250mg po q.i.d. for 10-14 days.

(2) Force fluids.

(3) Abstain from alcohol and sexual intercourse.

(4) Re-examine since infection may be stubborn.

6. Benign prostatic hypertrophy. This is a gradual enlargement of the gland, and often a normal process of aging. The major symptom is obstruction which appears as the gradual onset of hesitancy, straining during urination, reduced force and calibre of the urinary stream, nocturia, and acute urinary retention. On rectal exam the prostate is firm, enlarged, and non-tender. The difinitive treatment is surgical. For acute retention, catheterization of the bladder should be employed until evacuation.

7. Nephrolithiasis. Refers to the formation of stones in the renal pelvis. They are usually asymptomatic.

a. Signs and symptoms. When the stone or a piece of it attempts to maneuver down the small caliber ureter an important clinical syndrome, "renal colic," is produced. This includes severe, cramping abdominal and back pain, often radiating to the testes. The pain is severe enough to occasionally cause neurogenic shock and is often associated with nausea and vomiting. Characteristic is the tendency for the patient to walk around in an attempt to reduce the pain. The patient often assumes a fetal position in other abdominal conditions. Physical exam may be negative except for diffuse abdominal tenderness. Laboratory examination reveals hematuria of varying degrees.

b. Treatment:

(1) Forcing fluids to help pass the stone.

(2) Analgesia such as 1/4 grain morphine IM a 4h prn.

(3) Treatment of any secondary bacterial infection.

(4) Strain all urine through gauze.

(5) Any stones passed (they appear like small bits of gravel) should be saved for professional examination.

8. Masses in the scrotum. A hydrocoele is a pouch adherent to the testicle. It is filled with clear fluid and lined by peritoneum. Most are congenital or occur as the result of trauma and are usually asymptomatic. To aid in diagnosis, a light placed behind the mass will show through. This is transillumination and serves to distinguish this condition from solid

tumors which do not transilluminate. Bowel sounds coming from a mass in the scrotum indicate intestine has herniated through inguinal rings. If asymptomatic or early, gently replace in abdomen, bed rest and observe. Requires repair if gut blood supply is cut off, increased symptoms as in abdominal disease will occur. Support and evacuate.

9. Tumors of the testicle. Any hard and non-tender mass in the scrotum which you cannot diagnose with certainty and present for longer than four to six weeks should be seen by professional medical personnel.

10. Variococele. This is a varicose testicular vein (most frequently the left) which has the characteristic feel of a bag of worms adjacent to the testicle or cord. Though usually symptomless, a dull ache may occur in some patients, especially on long standing. Surgery is the definitive treatment.

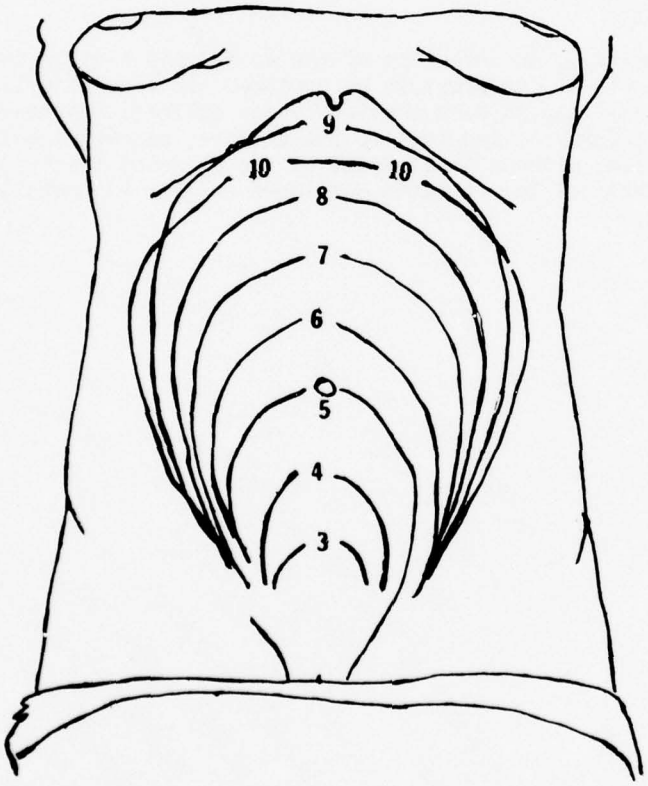
11. Epididymitis. An infection of the epididymis usually secondary to infection in either the prostate or urethra. In this condition, the epididymis, a small cap on each testicle which collects and transmits the sperm to the vas deferens and thus to the urethra, becomes exquisitely tender and swollen, without involvement of the attached testicle. The treatment is identical to prostatis mentioned earlier with the addition of scrotal support.

XXIV. OBSTETRICS.

A. Principles of Prenatal Care:

1. Delivery date. The expected delivery date may be calculated by taking the date of the first day of the last period, subtracting three months, and adding seven days. Example: If first day of last period is 5 May - minus three months is 5 Feb, plus seven days is 12 Feb.

2. Stage of pregnancy. Approximate stage of pregnancy can be determined by the height of the top of the uterus (the numbers refer to month of pregnancy).



3. Diet. A good diet contains protein, vitamins, and minerals (especially calcium), plenty of water, and roughage.

4. Salt. Salt intake should be limited throughout pregnancy, especially during the last month.

5. Weight. Emphasize the importance of limiting weight gain during the pregnancy to a maximum of 25 pounds.

6. Intercourse. No sexual intercourse during the month before delivery.

7. Exercise. A moderate amount of exercise, avoiding fatigue.

8. Clothing. Loose-fitting clothing should be worn.

9. Baths. They are permitted.

10. Symptoms. Instruct the patient to report any of the following symptoms promptly. If they occur, you must get her to professional care.

a. Vaginal bleeding.

b. Swelling of the face or fingers or marked swelling of the ankles.

c. Severe, continuous headache.

d. Dimness or blurring of vision.

e. Abdominal pain.

f. Persistent vomiting.

g. Chills and fever.

B. Normal Labor and Delivery. A primipara is one who has not delivered previously. A multipara is one who has had one or more children.

C. Course of Labor:

1. Bloody show. This is a discharge of blood-tinged mucus that often occurs with the onset of labor.

2. First Stage. This occurs from the onset of true labor pains to complete dilation and thinning of the uterine cervix. Average time for this stage is 12 hours in a primipara, eight hours in a multipara.

3. Second stage. Occurs from the end of the first stage through birth of the baby. Average time for this stage is 50 minutes in primiparas, 20 minutes in multiparas.

4. Third Stage. Occurs from end of second stage to expulsion of the placenta. Average time is 10-30 minutes.

D. Conduct of Labor.

1. Admission procedures:

a. Determine whether patient is really in labor. The main difficulty is distinguishing false labor from true labor pains. False pains are mild, intermittent, irregular, and are felt mostly anteriorly. True pains are stronger, more painful, occur at regular intervals, are felt mostly in the back, and the interval between pains steadily decreases.

b. Do a history and physical examination, determining:

(1) Time of onset of labor.

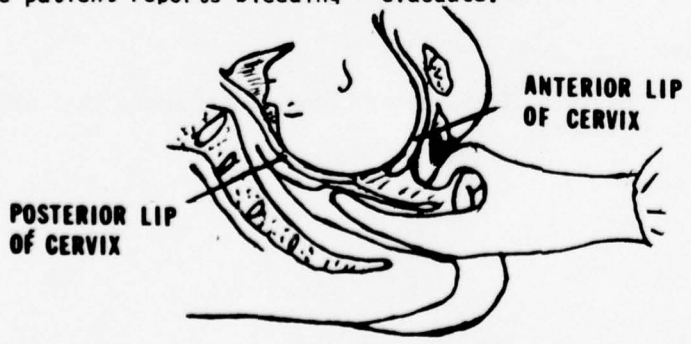
(2) Blood pressure.

(3) Force of knee jerk reflex.

(4) Fetal heart rate (normally varies from 120-150).

(5) Duration, interval, and strength of contractions.

(6) Rectal exam to determine height of the head above vagina, (or is it coming feet first?) and dilation of the cervix in centimeters. Do not examine if the patient reports bleeding - evacuate!



c. Put on bedrest.

d. NPO except for sips of water in early labor only.

2. Management of the first stage:

a. Instruct patient to relax and not to push or bear down.

b. Check BP and fetal heart rate frequently.

c. Start an IV infusion with D5W. Do not use saline!

d. Do rectal exams at intervals to determine progress of labor.

e. Do not give pain medication - instead use generous doses of understanding and reassurance.

3. Management of the second stage:

a. At the onset of the second stage, the membranes often break and the patient feels an urge to bear down.

b. Put patient in delivery position on her back with knees drawn up, holding her knees when she begins to feel the urge to bear down.

c. Cleanse the perineum and anus with soap or antiseptic.

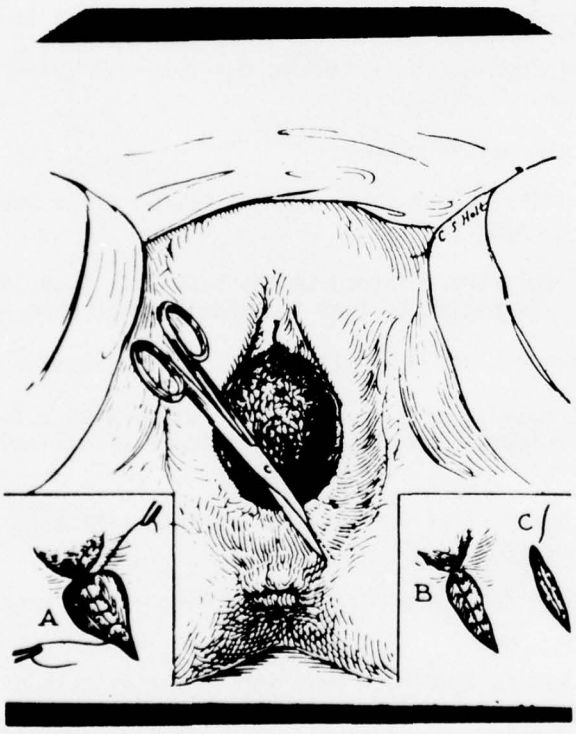
d. Infiltrate the episiotomy site, if one is used, with 1 percent procaine or 1 percent xylocaine when head begins to be visualized in primiparas and earlier in multiparas.

e. Monitor fetal heart tones between contractions - if they stay below 100, turn patient on her side.

f. Have patient bear down with each pain - long, steady push, but not between pains.

g. Remember that babies have been born for centuries without any anesthesia. Obstetric anesthesia is so dangerous it should not be attempted by medics. Simple local infiltration, however, is safe and desirable.

h. As birth approaches, the head distends the perineum more and more with each contraction. When two to three inches of fetal scalp show, an episiotomy may be necessary to prevent serious laceration. Most primiparas need an episiotomy; most multiparas do not. Perform the episiotomy with scissors in the area previously infiltrated. Cut the episiotomy one to one and one-half inches long.



i. When most of the head is visible, assist birth by the following maneuver. Your primary function is to prevent too rapid birth. If the head is allowed to "pop" out, the baby may have an intracranial hemorrhage and there is a greater chance that the perineum will be torn. Tell the mother not to push at this time.

j. When the head has been born, check to see that the cord is not around the neck. If it is, slip the loop of cord off over the baby's head. If this cannot be done easily, clamp the cord with two hemostats and cut between the clamps.

k. Allow the head to turn sideways by itself.



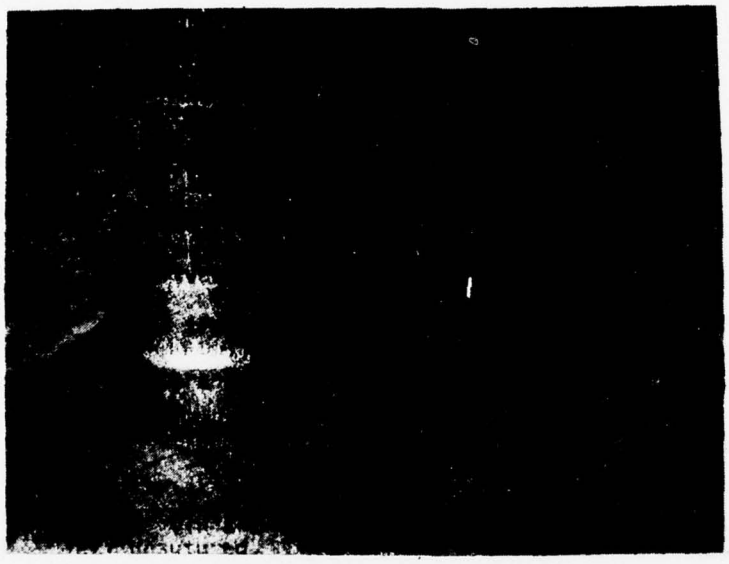
1. Next deliver the anterior shoulder by gentle, downward pull.



m. **Deliver the posterior shoulder by gentle upward pull. The baby will follow spontaneously.**



n. Keep the right hand under the baby's head and shoulders for support. Use left hand to grasp the ankles. Babies are very slipery. Elevate body enough to aid in drainage of mucus from chest and throat. Suction mouth and nose with a rubber bulb syringe. Place on mother's abdomen.



o. Clamp the cord about four inches away from the baby with two hemostats and cut between the hemostats. Then tie between the hemostat and baby with sterile strong, thick suture or cotton or linen ligature. Have mother hold baby in blankets to keep it warm.

E. Management of the Third Stage:

1. Do not hurry the delivery of the placenta - wait and watch.

2. When the membranes are visible at the vaginal outlet, pull gently on the cord while pushing down on the top of the uterus.

3. Membranes may adhere to the uterus and be torn off by too rapid delivery of the placenta. If this occurs, gently tease the membranes out by pulling and twisting with hemostat.

4. Immediately after delivery of the placenta, massage the uterus to make it contract into a tight, hard ball.

5. Give Pitocin 10 units IV if available.

6. Stay with the patient at least one hour following delivery to be sure there is no bleeding.

7. Suture any lacerations and the episiotomy with chromic catgut, 00 or 000. Start above apex of vaginal incision and close the vaginal mucosa with a running stitch. Suture the perineal portion as any other wound, making sure that anatomic structures are approximated. If the anal sphincter muscle or rectal wall is torn, these are repaired first. Try to get patient evacuated if lacerations are severe.

8. Drop one percent silver nitrate solution or penicillin ointment into each of the baby's eyes.

F. Post Delivery Care:

1. Keep the uterus firm by massage.

2. Take BP frequently in the hours after delivery.

3. Cover perineum with a sterile pad.

4. Soaks in a hot bath two to three times a day aid comfort and healing.

5. Take mother's temperature four or five times a day. Any elevation above 100.4°F present on successive days is evidence of infection.

6. Watch for difficulty in voiding - if unable to urinate by 12 hours after delivery catheterization may be necessary.

7. Breasts should have adequate support but not a tight binder. Milk appears three to four days after delivery.

8. Nipples should be kept clean.

9. May get out of bed six hours after delivery.

G. Care of the Newborn. If baby does not breathe spontaneously rub back vigorously. If still no breathing, slap sharply on the buttocks. If still no breathing, suction nose, mouth, and trachea with a small catheter and begin mouth to mouth breathing - very small puffs of air. Keep cord stump covered with a sterile dressing. May feed as early as 12 hours following birth, but babies often are not hungry for two to three days. Feed every three hours or so.

H. Complications.

1. Bleeding:

a. Prior to delivery, evacuate to a hospital. If this is impossible:

(1) Start blood transfusion.

(2) Rupture membranes in attempt to hasten delivery.

b. Post partum bleeding:

(1) Inspect cervix and vagina to insure that there are no bleeding lacerations left unsutured.

(2) Massage the uterus.

(3) Give pitocin 10 units IV push and add 20-40 units to the IV infusion.

2. If the foregoing are not sufficient, insert left hand into vagina and compress the uterus between the left hand and the pubic symphysis, with the right hand exerting pressure on the uterus through the abdominal wall.

I. Infection. If membranes are ruptured more than 12 hours prior to delivery, assume infection to be present and start antibiotics (penicillin if not allergic). If infection occurs after delivery, as evidenced by fever, foul smelling discharge, and tender uterus, start antibiotics (penicillin and chloramphenicol are good).

J. Toxemia (Prior to Delivery):

1. Signs:

a. Blood pressure greater than 140/90.

b. Protein in urine.

c. Edema of fingers, face, and ankles.

d. Very brisk knee jerk reflexes.

2. Treatment - evacuate if possible. If it occurs during labor, give magnesium sulfate 10gm in 50 percent solution, 10ml in each buttock, followed by 5gm every six hours. Keep room dark and quiet. Sedate patient heavily with morphine and phenobarbital after delivery until diuresis occurs. Toxemia will stop after delivery.

K. Breech Deliveries:

1. Let the baby be expelled spontaneously to the umbilicus.

2. Cut a generous episiotomy.

3. Deliver the buttocks by gently pulling upward.

4. Pull gently until an axilla is visible. Do not exert pressure above the iliac crests upon the abdomen (of the baby) to avoid injury to the abdominal organs.

5. Have an assistant press downward on the fundus gently.

6. Deliver the anterior or posterior shoulder, whichever is easier.

7. Deliver the other arm.

8. Deliver the head by:

a. Baby lies on your arm, with index finger in baby's mouth.

b. Two fingers of the other hand are hooked over each shoulder, palm on baby's back.

c. Pull downward until occiput is under the symphisis.

d. Bring head out by raising the baby's body up toward the mother's abdomen.

XXV. Anesthesia.

A. General Considerations of Premedication.

1. Purposes and drugs used in premedication:

a. Psychic sedation (alkaloids derived from belladonna, barbiturates, and narcotics).

b. Reduction of metabolic rate and decrease of reflex irritability. It decreases oxygen requirement, facilitates induction with N_2O, and reduces quantity of anesthetic drug necessary (opium alkaloids and barbiturates).

c. Minimizing or abolishing secretion of saliva and mucus (parasympathetic depressants and atropine).

d. Prophylaxis to avoid anticipated undesirable physiological and pharmacological effects produced by certain drugs or procedures. Decreases vagal effects accompanying anesthesia with pentothal (vasopressor drugs, parasympathetic depressants, and barbiturates).

2. Evaluation of drugs:

a. Morphine. Reduces metabolic rate and produces psychic sedation.

b. Demerol. Mild sedative and analgesic action greater than codeine, but less than morphine. It possesses an atropine-like action. Average dose gr. 1-1/2 administered simultaneously with atropine or scopolamine.

c. Barbiturates. Useful for psychic sedation. Barbiturates produce amnesia, but no analgesia.

d. Paraldehyde. Employed as a sedative for chronic alcoholic addicts.

e. Atropine. Stimulates cortex and medullary centers. Paralyzes vagal nerve endings.

f. Vasopressor drugs. Epinephrine, ephedrine, and neosynephrine.

B. Technique of Premedication of Anesthesia:

1. Inhalation anesthesia. Adults considered to be average cases use morphine sulphate gr 1/4, scopolamine hydrobromide gr 1/100 (ration of 25:1) subcutaneously, one to one and one-half hours prior to induction of anesthesia or morphine sulphate gr 1/4 subcutaneously atropine sulphate gr 1/100.

2. Regional anesthesia. Administer a mixture of morphine and scopolamine in same quantities and proportion with same technique as for inhalation anesthesia or administer a barbiturate.

3. Intravenous anesthesia. Administer atropine or scopolamine gr 1.100 one to one and one-half hours prior to anesthesia. Morphine sulfate 1/6 to 1/8 gr subcutaneously one to one and one-half hours prior to anesthesia. Morphine is omitted by many anesthetists because it may enhance the respiratory depression produced by the barbiturate.

4. Common errors in premedication:

a. Premedication administered too early causes excess secretions, excitement, and results in prolonged and difficult induction.

b. Insufficient premedication. Same as above.

c. Administered too late. Excess mucus, prolonged excitement, and depression of respiration.

d. Over premedication. Depression of respiration and circulation and relaxation is difficult to secure.

e. Premedication omitted. Induction period prolonged, marked excitement, copious flow of mucus, laryngeal spasm, and patient may be uncooperative if regional anesthesia is employed.

5. General comments.

a. Do not omit premedication because induction and maintenance of anesthesia becomes difficult. The patient suffers, the anesthetist is handicapped, and the operation is delayed. Do not administer premedication after anesthesia has been started. Its effect is required to facilitate induction of anesthesia. The effects of morphine upon respiration may appear during the course of anesthesia and confuse the anesthetist.

C. Apparatus and Equipment for Inhalation Anesthesia. A source of oxygen, devices to dispose of carbon dioxide and to vaporize liquid anesthetic drugs, and open masks (the air supplies the oxygen and carbon dioxide escapes through the mesh of the cloth. Air oxygen, or other gases may be bubbled through certain volatile liquids).

D. Stages of General Anesthesia:

1. Analgesia. From the beginning of the administration of anesthesia to the beginning of loss of consciousness. This stage is limited to obstetrics, dental extractions, and superficial operations.

2. Delirium. From the loss of consciousness to the loss of the lid reflex. This stage is of brief duration and is often unnoticed in well premedicated subjects.

3. Surgical. From the loss of lid reflex to cessation of respiratory efforts. Surgery is performed in this stage.

4. Overdosage.

E. Depths of Anesthesia for Surgery:

1. First plane. Incision and drainages of superficial abscesses, superficial operations on skin, plastic surgery, suture of tendons of small muscles, reduction of fractures of small bones, and normal obstetrics.

2. Second plane. Surgery of the large bones, perineal operations, tonsillectomy and other pharyngeal surgery, thoracic surgery, and amputations.

3. Third plane. Upper abdominal surgery and rectal surgery.

4. Fourth plane. Not employed under any circumstances.

F. Ether Anesthesia. This is used for surgery of all types, particularly that requiring relaxation of muscles. Premedication consist of morphine and atropine in standard doses (1/4gr morphine and 1/100gr atropine one and one-half hours before surgery). Induction of ether anesthesia is prolonged because of the irritating effects of ether. In order to simplify and shorten the induction period the patient is anesthetized with a non-irritating rapid acting drug. The first and second stages of ether anesthesia are therefore shortened.

1. Advantages of ether:

a. Useful for all types of surgery.

b. Possesses a wide margin of safety.

c. Inexpensive.

d. Chemically stable and easily preserved.

e. Administered with very simple apparatus and may be administered by inexperienced individuals under surveillance of an experienced anesthetist in emergencies.

2. Disadvantages of ether:

a. The period of induction is slow, prolonged, unpleasant, and often accompanied by excitement.

b. Recovery is slow because tissues absorb a large amount of the agent and desaturation is slow.

c. It is inflammable.

d. It is irritating to respiratory passages and causes coughing, secretion of mucus, and salivation.

e. It disturbs important metabolic functions. Liver function, acid-base balance, and carbohydrate metabolism are affected particularly.

3. Contraindications to ether. Acute or chronic infections of the upper and lower portions of the respiratory tract. Diabetes results from elevation of blood sugar accompanying anesthesia. Nephritis or renal insufficiency results from transient decrease in renal function following anesthesia.

4. Ether by the open drop method. For anesthesia which must be administered by inexperienced individuals. Premedication includes morphine and atropine.

a. Complications:

(1) Excess mucus secretion.

(2) Laryngeal spasm.

(3) Overdosage: occurs after anesthesia is well established.

(4) Conjunctivitis.

(5) Blistering of the skin.

b. General comments. If coughing occurs during the induction period, or concentration of ether is increased too rapidly, lift mask momentarily and replace it after the patient takes several breaths of air. The concentration in the pharynx is diluted by this maneuver and spasm is avoided. Do not cease dropping ether if patient becomes excited. Continue the administration as rapidly as it is tolerated. The object is to increase the concentration and pass into stage III as soon as possible. Remove all secretions as often as necessary. If signs of suboxygenation appear, insert a nasal catheter into one nostril and administer oxygen at the rate of 5 l or more per minute. When air along is a vehicle for the vapor, the oxygen tension may be reduced.

G. Anesthesia by Intravascular Injection.

1. Available drugs. Ether is shaken with physiological saline, the excess removed, and the aqueous solution injected. The volume of solution necessary to maintain surgical anesthesia therefore would be too great. Barbiturates are not analgesic drugs.

2. Intravenous administration:

a. Veins of the plexus on dorsum of the hand.

b. Greater sapnenous at inner aspect of the ankle.

c. Veins of plexus on dorsum of the foot.

d. Internal and external jugular veins.

H. Intravenous Anesthesia Using Sodium Pentothal. Used for minor procedures of approximately 30 minutes or less duration. Dosage is one gram (15 grains) in 40cc of distilled water or physiological saline.

1. Premedication. Atropine, gr 1/150 to 1/100, one hour prior to anesthesia. Atropine antagonizes vagal effects of the barbiturate and minimizes laryngeal spasm. Morphine (often omitted) gr 1/8 to 1/4, one hour prior to anesthesia.

2. Procedure. Ask the patient to count aloud slowly at the rate of one per second. Inject the drug slowly, do not exceed 2cc in the first fifteen seconds. Stop and wait (patient will be narcotized in 30-40 seconds). Slowly inject 1/2 to 1cc of solution from time to time as required.

3. Disadvantages:

a. The anesthesia is noncontrollable.

b. Laryngeal spasm may develop.

c. The necessary effective dose is difficult to estimate.

d. A severe respiratory depression ensues.

e. Pentothal is a barbiturate which does not possess any analgesic properties.

f. The muscular relaxation is not satisfactory.

4. Signs of anesthesia. No reliable signs of anesthesia exist. The anesthetist must attempt to maintain the patient between the zones of decreased reflex activity and respiratory and circulatory failure.

5. Complications:

a. Respiratory failure.

b. Hypotension.

c. Laryngeal spasm.

d. Slough of skin. Solutions of the sodium salts of barbiturates are alkaline and causes damage to tissues in event of seepage.

e. Phlebothrombosis.

f. Prolonged somnolence.

g. Operations of undetermined length. Large amounts of the drug may be necessary to complete the operation. This causes a marked depression of respiration and circulation from cumulative effects.

h. Shock from trauma or hemorrhage. Irreversible respiratory failure or enhancement of hypotension may occur.

6. Precautions:

a. The limit should be approximately one gram of the drug for an adult.

b. Be positive that the drug is completely dissolved and that the solution is clear before performing venipuncture. Undissolved particles act as foreign bodies in the solution and may cause "reactions".

c. Inject the solution slowly. Do not inject more than 6cc of a 2-1/2% solution at any one time at the onset.

d. Draw back as little blood as possible into the syringe. The blood proteins precipitate in the solution and the cells are hemolized. Large volumes of blood tend to dilute the total volume of solution making it difficult to judge dosage accurately.

I. Overdosage or Toxic Reaction of Local Anesthetic Drugs.

1. Types of Reactions:

a. Neurological signs and symptoms include intense stimulation of the nervous system. If the dose is large or stimulation is prolonged, depression follows. The reaction may be divided into an early or stimulating phase and a delayed or depressed phase. The early part of the stimulating phase cause excitement, sudden headache, nausea, vomiting, and twitchings of small muscles. Advanced part of stimulation phase may include convulsions. Depressed phase may include paralysis of muscles, loss of reflexes, and unconsciousness. Treatment consists of oxygen inhalation and IV injection of a barbiturate.

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b. Circulatory:

(1) Symptoms and signs:

(a) Pallor.

(b) Tachycardia.

(c) Sudden collapse characterized by circulatory failure.

(d) Reaction on skin in area of injection.

(2) Treatment:

(a) Prone position, lower head.

(b) Artificial respiration with oxygen.

(c) Intracardiac epinephrine.

(d) Local anesthetics depress cardiac tissue.

J. Testing for Sensitivity to Local Anesthetic Drug. This is used to determine whether or not the patient has an idiosyncracy to the drug which is to be employed.

1. Procedure for skin test. Raise a small intradermal wheal approximately five millimeters in diameter with saline solution. Raise a similar wheal three or four centimeters from this area using the local anesthetic drug to be tested. After five minutes, if both wheals appear to be alike, the test is negative.

2. Procedure for intranasal test:

a. Record blood pressures and pulse at three minute intervals until stabilized.

b. Introduce three drops of the solution to be tested into each nostril with patient in supine position.

c. Observe blood pressure and pulse every three minutes for next twenty minutes. Neither a slowing or acceleration of the pulse nor an elevation or depression of blood pressure should occur.

K. Topical Anesthesia. Anesthesia is produced by application of the agent to the body surface. Local agents do not penetrate unbroken skin as acqueous mixtures, but when mixed with oily or cream bases they will penetrate to the degree that pain sensations can be suspended. They will penetrate mucous membranes easily and are absorbed. Reactions are as frequent as local anesthesia and produces the same symptoms. Treatment for reactions is the same as for regional agents. Drugs:

1. Nupercaine (Dibucaine). Potent anesthetic used for hemorrhoids. Duration is two to four hours.

2. Tetracaine hydrochloride (Pontocaine). Potent anesthetic used as ocular anesthesia. Duration is one and one-half to three hours. Onset is almost immediate. Common spinal anesthetic. Dosage should not exceed 0.5% in white petroleum for eyes or 2% for nose and throat spray. Can be boiled for sterilization.

3. Proparacaine (Ophthaine). Ocular anesthetic. Used to measure intraocular pressure. Dosage is 0.5%, 1-2 gtts each eye. Onset is stat. Duration is 15 minutes.

4. Ethyl chloride. This is a skin spray and has a limited use. Confine to incising furuncles (poor). Good treatment for creeping eruption and kills worms.

5. Hexylcaine (Cyclaine). Used to anesthetize pharynx, larynx, and trachea or urethra as with intubation or cystoscopy. Dosage is 5 percent sol (maximum concentration) when applied to throat with spray, gargle, or packs. Patient should not swallow this. Dosage is about 10ml for intubation.

L. Regional Anesthesia.

1. Types:

a. Local. Anesthesia applied only to the operative field.

b. Field block. Surrounding the operative field with a wall of anesthesia.

(1) Minimum anatomical distortion.

(2) Procedure of choice for debridements and most minor surgery.

(3) Called local anesthetic in common usage.

c. Nerve block. Anesthesia applied to the nerve supplying a particular area.

2. Drugs:

a. Lidocaine (Xylocaine):

(1) Available as 50cc bottles of 1% and 2% with and without epinephrine and in dental vials.

(2) Onset is almost immediate, maximum 15 minutes.

(3) Duration is two hours.

(4) Maximum dose is 50mg one hour = 50cc of 1%.

(5) For large wounds dilute to 0.5%; e.g., 50:50 saline and 1% xylocaine.

b. Procaine:

(1) Available as 0.5%, 1.0%, and 2%.

(2) Onset is slightly longer by minutes than xylocaine.

(3) Duration is 45-75 minutes.

(4) Maximum dose is 1gm; e.g., 100cc of 1%. This is exactly double the xylocaine dose maximum. One half original dose can be repeated in 20 minutes without toxic effect.

c. Epinephrine. Use of epinephrine with regional drugs used to slow down absorption of the anesthetic by vasoconstriction, made anesthesia last longer, and decreased blood in the field. Contraindicated for surgery of penis, toes, or fingers (causes ischemic gangrene).

3. Toxic reactions to regional and topical anesthetic. Almost always due to increased sensitivity or overdose. Uncommon.

a. Convulsions. Includes twitching and gradual seizures. Treat with IV short acting barbiturate; e.g., pentothal sodium 2.5% - a few ml IV (1-300mg). Administer O_2. If not breathing, give mouth to mouth resuscitation STAT.

b. Cardio vascular collapse. Causes hypertension and shock. Treat with 100% O_2, 0.8cc - 1.0ml 1:1000 epinephrine IV STAT. If cardiac arrest occurs begin closed chest, massage STAT.

c. Allergic reactions (extremely rare). Urticaria and anaphylaxis. Treat with antihistamine.

d. Reaction to the vasopressor. Causes mild apprehension, palpitations, and tachycardia. Usually no treatment is necessary.

4. How to avoid toxic reactions:

a. Never inject patient with history of sensitivity to the anesthetic. Question the patient first.

b. Give anesthesia slowly. Pull plunger back when infiltrating to avoid IV dosage. Give smallest amount necessary to do the job.

c. Give oral barbiturate; e.g., secobarbital 100mg one hour prior to procedure when patient is likely to be apprehensive. Morphine will do the same job. Don't add epinephrine to anesthetic which already has epinephrine in it. Have O_2 and epinephrine 1:1000 or similar vasopressor READY. Have 0.5 - 1.0 epinephrine. (25-50mg) or .5 - 1mg phenylephrine (neosynephrine) in the syringe READY TO USE.

d. Topically applied drugs should be measured as carefully as those given by injection.

M. Infiltration Technique:

1. Give pre op med PRN. Reassure patient.

2. Assemble all equipment.

3. Prepare surgical area.

a. Remove adhesive with benzene or ether.

b. Wash and shave area.

c. Apply antiseptic; e.g., zephiran chloride. When using iodine antiseptic, dry skin before applying iodine. Wipe off excess and drips at edges with alcohol sponge (concentrated iodine burns skin). Don't contaminate the site after cleaning.

4. Open sterile materials.

5. Fill syringe from bottle with assistant's aid. If no assistant is available, empty anesthetic into beaker then fill from beaker.

6. Produce skin wheal. Introduce needle into dermis with beveled side down and inject enough anesthetic to produce one-half inch wheal.

7. Extend the anesthesia. Introduce needle through wheal to infiltrate deeper tissues or to surround operative area. Slowly advance needle and inject solution. Redirect needle course as needed. If it is necessary to refill syringe, withdraw needle and refill. Readmit needle into anesthetized area. Avoid excessive skin punctures. While infiltrating pull plunger occasionally and if it draws blood, needle is in vein, do not inject into vein - redirect needle. Action is almost immediate after infiltration but check with needle point to make sure before beginning. Do not inject anesthetic from within the wound out into tissues or vice versa as infection from the wound may be drawn into surrounding healthy tissues.

XXVI. VENEREAL DISEASE.

A. General. The venereal diseases to be considered are syphilis, gonorrhea, chancroid, granuloma inguinale, and lymphogranuloma venereum. All are contracted by sexual contact, potentially dangerous, and amenable to treatment. No punishment or humiliation should be used on any patient who may have a venereal disease. This would tend to make the patient avoid treatment, thus masking the disease and making it more difficult to control.

B. Axioms on VD. The chancre is the classical lesion of syphilis and chancroid. Generally, the chancre of syphilis is painless; the chancre of chancroid is painful. This is not 100 percent true. Many women have non-gonorrheal vaginal discharges and many men have a urethritis and urethral discharge that is not gonococcal in origin. Treating the marital or sexual partners and known contacts is as important as treating the patient if spread of the disease is to be controlled. It is better to "overtreat" than to treat inadequately.

C. Syphilis. Caused by treponema pallidum, a spirochaete:

1. Transmission is by sexual contact or from the mother to the baby through the umbilical cord.

2. Incubation period. Ten to ninety days (average 21 days).

3. Clinical symptoms:

a. Primary syphilis. Appears two to six weeks after infection. Chancre lasts three to eight weeks, usually on the genitals. Satellite bubo.

b. Secondary syphilis. Appears two to six months after chancre disappears. Rash, mucous patches, alopecia, fever, and malaise.

c. Latent syphilis. No clinical symptoms.

d. Late complicated syphilis. Ten years or more. Gumma of bone or viscera. Pupillary changes, paresis, tabes-dorsalis, and locomotor ataxis.

4. Diagnostic procedures:

a. Infectious syphilis:

(1) History and physical examination.

(2) Darkfield examination.

(3) STS.

(4) History and sexual exposure.

b. Latent and late syphilis:

(1) History and physical examination.

(2) STS.

(3) Spinal fluid examination.

5. Treatment. The recommended antibiotic doses for GC will be inadequat for syphilis.

a. Penicillin is the drug of choice.

b. Procaine Pen. G. 600,000 units IM daily for one week.

c. Benzathine Pen. 2,400,000 units, then repeat in one week.

d. Tetracycline for 14 days or erythromycin for 14 days if patient is allergic to penicillin.

D. Gonorrhea. This disease is caused by the gonococcus (N. gonorrhea) which is a gram negative diplococcus occurring intra- and extracellularly.

1. Transmission in the female is sexual intercourse or from the mother to the baby's eyes during birth. It is transmitted by sexual intercourse in the male.

2. Incubation period. Two to fourteen days (average three to five days

3. Clinical symptoms:

a. Female:

(1) Burning and pain on urination.

(2) Swelling and sensation of heat in genitalia.

(3) Vaginal or urethral discharge.

(4) Abdominal pain if advanced case (salpingitis).

(5) May be asymptomatic.

b. Male. Pain or burning on urination and purulent urethral discharge.

4. Diagnostic procedures:

a. History and physical examination.

b. Culture.

c. Smear.

d. History of contact.

5. Treatment:

a. Penicillin, symptoms will clear in about three days. Men, 2,400,000 units procaine pen IM in one injection, then may repeat in two days; women, 2,400,000 units procaine pen IM in each hip initially, then 1,200,000 units in each hip two days later.

b. Alternate drugs in case of allergy to penicillin are tetracycline and erythromycin, 500mgm po q.i.d. for three days. A persistant, watery urethral discharge may follow adequate antibiotic treatment. This need not be treated unless it becomes purulent, irritating to the patient, or prolonged in duration. If you choose to treat this, use tetracycline in the above regimen. Consult the surgeon for the current treatment regimens in his area.

E. Chancroid. This is caused by the bacillus ducrey (hemophilus ducreyi).

1. Transmission. Sexual contact.

2. Incubation period. Two to six days.

3. Clinical symptoms. Include ulcer on genitalia and buboes (inguinal region in males and perineal region in females).

4. Diagnostic procedures:

a. History and physical examination.

b. Exclusion of syphilis by darkfield examination and STS.

c. Culture and identification of hemophilus ducreyi.

5. Treatment. Use sulfonamides, streptomycin, and tetracycline.

F. Granuloma Inguinale. This is caused by Donovan Bodies.

1. Transmission. Sexual contact.

2. Incubation period. Indeterminate, a few weeks to a few months.

3. Clinical symptoms. Include papule on genitalia and inguinale or perineal granulating ulcers.

4. Diagnostic procedures:

a. History and physical examination.

b. Exclusion of syphilis by darkfield examination and STS.

c. Microscopic examination for Donovan Bodies by smears and biopsy.

5. Treatment. Use streptomycin, chlortetracycline, oxytetracycline, or tetracycline.

G. Lymphogranuloma Venereum. This is caused by a filterable virus.

1. Transmission. Sexual contact.

2. Incubation period. Five to thirty days.

3. Clinical symptoms. Vesicle on genitalia.presents before bubo does. Inguinal adenitis. "A bubo" - can be bilateral. Rule out plague, the patient will be much sicker in plagues.

4. Diagnostic procedures:

a. History and physical examination.

b. Exclusion of other VD and plague.

c. Frei test.

d. Biopsy.

e. Complement fixation test.

5. Treatment. Use sulfonamides or tetracycline.

XXVII. HEENT.

A. Hair. Blepharitis is dandruff of the eyelids and is present in patients with scalp dandruff.

1. Signs and symptoms:

a. Greasy yellow scales in the lids.

b. Redness of the eye lids.

c. Scalp dandruff present.

d. May progress to ulcerative stages with purulent crusts (staph) and hair loss.

2. Treatment. Treat and control the scalp dandruff, clean off scales b.i.d. with an oily preparation and in ulcerative stage use topical antibiotic daily.

B. Eyes:

1. Hordeolum. This stye may be on the external lid or lid margin or internal on the conjunctival side of the lid.

a. Signs and symptoms:

(1) Red, swollen, tender papule on the lid becomes pustular.

(2) Painful.

(3) Can progress to cellulitis of the lid and orbit or form a chalazion, painless hard swelling in the lid which can enlarge and disturb vision. Once a chalazion is formed, the only treatment is for an MD to curette it out.

b. Treatment:

(1) Heat.

(2) Anti-staph antibiotics.

(3) Incise with needle point when it forms a head. Treat for several days after beginning treatment since they tend to recur.

2. Dacrocystitis. The nasolacrimal duct becomes stenosed and infected. Lacrimal glands located at superior lateral orbit produces tears which flow across globe to inferior medial where the nasolacrimal apparatus transfers it beneath the skin immediately lateral to the nose and inside beneath the inferior nasal turbinate.

a. Signs and symptoms include red, swollen tender abscess beneath lid margin next to nose and tears running down cheek due to duct obstruction.

b. Treatment:

(1) Heat.

(2) Penicillin ophth, three drops 1000 /cc every three hours. Penicillin IM.

(3) Do not I&D.

3. Conjunctivitis. Inflammation of the conjunctiva. The conjunctiva is a membrane that covers the inside of the eye lids and extends out into the globe external to the sclera and ends at the cornea. This junction of cornea, sclera and conjunctiva is called the limbus. Acute bacterial conjunctivitis, "pink eye," usually due to pneumococcus spread by towels and fingers.

a. Signs and symptoms:

(1) Scratchy, foreign body sensation.

(2) Red conjunctiva. May have petechial hemorrhages. Mild swelling of conjunctiva.

(3) Serous (clear) secretions.

b. Treatment:

(1) Isolate patient (self-limiting disease) two to eight days. Incubation up to two days with treatment. Clears in four days.

(2) Saline washed b.i.d.

(3) Penicillin or sulfa gtts t.i.d. Don't use steroids.

(4) Mild analgesics, cold compresses for relief; always patch the eye after giving ocular anesthetic.

(5) Five percent sulfadiazine qhs prn eyelids sticking together.

4. Gonococcal conjunctivitis. Due to GC from genital tract by hands.

a. Signs and symptoms:

(1) Unilateral.

(2) Profuse pus discharge.

(3) Swelling, severe, conjunctiva may swell out into cheek. Can go on to involve cornea and lead to blindness.

b. Treatment:

(1) Protect other eye with a shield. Insert medications with the head held so that pus runs laterally. Do not wipe eye toward nose.

(2) Penicillin - 3 gtts 1000 u/cc every hour. Penicillin IM.

(3) NS washes b.i.d. (away from opposite eye).

(4) Silver nitrate one percent every two hours initially followed with saline wash is very efficacious. Used in newborn to prevent possible GC. If your eye becomes infected, instill anesthetic and treat as above.

5. Trachoma. An infection of the conjunctiva by a large atypical virus. The disease is said to be the most common disease of the world second to the common cold. Found in dirty crowded conditions.

a. Signs and symptoms:

(1) Ch. bilateral conjunctival redness with itching.

(2) Watery discharge.

(3) Lumps resembling raspberries form on the inner eyelid after three to four days. These lumps (follicles) start to scar and cause the eyelashes to turn in to the cornea which causes ulcerations and possible blindness. When tearing is lost, the eye becomes dry and the cornea looks gray.

b. Treatment. Long term therapy at least six weeks, symptoms may take a month before showing increased improvement. Tetracycline ointment t.i.d. Gantrisin q.i.d.

6. Foreign body:

a. Signs and symptoms:

(1) Foreign body sensation or irritation.

(2) Red conjunctiva.

(3) Tearing.

(4) Fluorescein staining negative unless abrasion is present.

b. Treatment:

(1) Examine eye from all angles and check the under side of lids for foreign bodies.

(2) Lift a small foreign body off the globe or lid with a wet Q-tip or cotton applicator.

(3) More firmly imbedded objects may require pontocaine anesthesia. A #20 needle point can be inserted beneath the foreign body to lift it from the globe. Patch the eye after ocular anesthetics.

7. Corneal abrasion:

a. Signs and symptoms. Same as for foreign body. Fluorescein will give (+) sign.

b. Treatment. Same as for foreign body, but keep patched for 24 hours and have patient return for recheck.

8. Corneal ulceration. A medical emergency preceded by foreign body or corneal abrasion.

a. Signs and symptoms:

(1) Pain.

(2) Blurred vision, photophobia.

(3) Gray necrotic spot on the cornea, red conjunctiva, and tearing.

b. Treatment. Early treatment is needed to prevent progression to permanent blurring or blindness. Treat as with corneal abrasion. Do not use steroid or antibiotic preparation as the ulcer may be infected with virus which gets worse on steroids. Corneal ulcer must be differentiated from iritis (small pupil and clear cornea), conjunctivitis (no blurring, clear cornea, and copious discharge), and old corneal opacites (long history and no discharge).

9. Lacerations:

a. Lids. Don't suture margins if possible since nothing, entropin (turning inward) or ectropion (turning outward) can result. Suture lids with small gauge material. Do not debride. Be particularly careful about restoring the original contours without puckering, etc.

b. Conjunctiva. Superficial cuts need not be sutured. Instill antibiotics.

c. Cornea or sclera. Keep exam and manipulation at a minimum to avoid squeezing intra-ocular contents out of the glove. Bandage both eyes if tactically feasible and use mild analgesics prn while waiting evacuation.

d. Penetrating wounds of the globe:

(1) Examine carefully.

(2) Look for a hyphema (blood in the anterior chamber).

(3) Determine whether the penetration is into the anterior chamber or the posterior chamber. Anterior wounds do much better as aqueous humor will be replaced, but vitreous humor is not.

(4) Do not remove object, bandage, evacuate, and give analgesics.

(5) If medical evacuation is impossible, remove foreign body:

(a) Anterior laceration should be sutured.

(b) Suture lid closed, bandage, and give ocular anesthetic.

(c) Institute sulfa systemically and analgesics prn.

(d) Remove sutures in ten days if no purulent drainage.

(6) If no medical evacuation is possible, all severely injured eyes (perforation of the sclera and ciliary body with extrusion of the vitreous), should be enucleated within ten days after injury to prevent sympathetic opthalmia.

(a) Enucleation under local anesthetic incise at the junction of the lid conjunctiva and globar conjunctival for 360°.

(b) Lift the globe out and then cut the four extracellular muscles and optic nerve.

(c) Suture the cut edges together, then the lids.

(d) Support with analgesics and treat with usual wound care.

10. Uveitis and iritis. Uveal tract includes ciliary body, iris, and choroid. May be acute or slow onset.

a. Signs and symptoms:

(1) Unilateral deep ocular pain.

(2) Constricted pupil, swollen iris, and smaller pupil.

(3) Blurred vision and photophobia.

(4) Soft mushy globe may be present. Circumcorneal conjunctival flush

(5) Red conjunctiva, no purulent damage, and may be tears.

(6) Without treatment signs and symptoms may progress. Iris scars to lens is called posterior synechiae which results in irregular pupil and can block flow of aqueous from ciliary body through pupil to canal of schlegm at junction of anterior iris and sclera = 2° glaucoma. Aqueous fluid is cloudy due to leakage of protein from blood vessels. It may form layer of WBC, debris in bottom of anterior chamber (hypopyon) or floating debris or precipitates on the posterior cornea. Small opaque dots called "keraotic precipitates".

b. Treatment:

(1) The object is to avoid scar between the iris and lens and stop the pain.

(2) Dilate pupil, homatropine q.i.d. or atropine one percent, moves iris away from lens.

(3) Analgesics (avoid narcotics like morphine) e.g., ASA.

(4) Dark glasses or room.

(5) Hydrocortisone 2.5%, 2 drops every two hours, hydrocortisone 100mg for three days.

(6) Warm compresses q.i.d.

(7) If treatment for 24 hours fails to dilate pupil use ocular anestheti and 1:100 epinephrine saturated pack between lower lid and globe every 30 minutes until full dilation or 12 hours. Continue with treatment.

(8) If disease is chronic form, then probably TB. In reliable patients add TB therapy.

11. Retinal detachment. Retina separates from choroid or sclera.

a. Signs and symptoms:

(1) Usually post traumatic.

(2) Patient complains of sudden loss of portion of visual field.

(3) Retina looks black or gray and folds may be present.

(4) No pain.

b. Treatment. Evacuate with both eyes bandaged if possible. Surgery is only effective treatment. Good prognosis.

12. Glaucoma. Increased pressure within the globe. Etiology includes increased production (two percent of all people over 40 years old have this). It is a leading cause of blindness and is preventable. It is called chronic glaucoma. Block of fluid flow; e.g., iritis. Called two degree glaucoma. Block of outflow at canal of schlegm. Called acute glaucoma. May occur in patients with chronic glaucoma.

a. Signs and symptoms:

(1) Chronic glaucoma:

(a) No symptoms until late in disease.

(b) Patients lose peripheral vision until only central field vision remains and then this may be lost.

(c) Treatment stops progression but does not repair the damage.

(2) Acute glaucoma:

(a) Ocular pain.

(b) Red conjunctiva.

(c) Pupil dilated.

(d) Cornea steamy, fluid under pressure is driven into the cornea.

(e) Globe may be stony hard.

(f) "Halos" around lights, blurred vision.

b. Treatment. The object is to get the constricted; therefore, move the iris out of the canals of schlegm plus alleviate pain.

(1) Pilocarpine 1-2% q.i.d.

(2) Morphine prn. Morphine causes constriction so it may institute even if pilocarpine is not available. Diamox 250mg t.i.d. po (decreases fluid production). Give only DMR in fluids.

(3) Refer to MD.

13. Strabismus. Muscular imbalance of the eyes. In early childhood, severe imbalance leads to blindness in one eye. The brain stops using one eye apparently in order to produce a single image. The best vision eye is patched and patient is forced to use the other eye until he redevelops good vision. If this is successful, muscle surgery may be done to straighten the eyes.

14. Color blindness. Defective color vision is inherited and occurs in about seven percent of males in the US and one percent in females. The ishihara color plate test is very sensitive and picks up even mild losses. Patients should be checked with the Farnsworth lantern (white, green, and red lights) or colored yarn to determine extent of loss if they fail the color plates since there are different requirements for special training. Most individuals are missing either red or green hues, but not completely.

15. Differential diagnosis. Acute red eye.

a. Foreign body.

b. Corneal laceration or abrasion.

c. Corneal ulcer.

d. Conjunctivitis.

e. Acute uveitis (iritis).

f. Acute glaucoma.

g. Subconjunctival hemorrhage.

h. Allergy, crying, post alcohol, leptospirosis.

16. Ocular glasses only improve the image you visualize. They do not change your ocular ability. If you do not wear prescribed glasses, you do not see as well as if you did wear them but neither temporary nor permanent damage is incurred. Visual activity can be checked by ability to see small print at close range, count fingers at near and far, standard eye chart or distinguish light and dark.

C. Ear:

1. Auditory activity. Place finger in patients opposite ear. Whispered voice tests low frequencies, watch tick tests high frequencies, and tuning forks are used for checking full range.

2. External otitis. Infection of the external ear canal (90 percent due to pseudomous which is gram negative). Fungus uncommon. Gram positive present only with furuncles.

a. Signs and symptoms:

(1) Pain on movement.

(2) Itching, redness, swelling, increased debris, and exudate.

(3) Furuncle present with staph.

(4) TM may be reddened at the edges.

b. Treatment:

(1) Heat and I&D furuncle.

(2) Burrow's olution (aluminum acetate). One tablet in 100cc water, four qHs q.i.d., use cotton wick down to TM if canal swollen closed.

(3) Antibiotic, any gram negative antibiotic.

(4) Steroid, prn itching; e.g., cortisporin has antibiotic and steroid.

(5) Avoid water in the ear. Use cotton before bathing. Clean the ear out thoroughly at each exam; i.e., ear spud + HO_2 wash. Avoid patients use of Q-tips. Culture prn resistant cases. In SCUBA divers a prophylaxis for fungus is two percent salicylic acid in alcohol 6 qtts t.i.d. It will also dry out the canal.

3. Acute serous otitis media. Serous fluid accumulates due to blockage of the eustachian tube following a tonsillitis, hay fever, or pharyngitis.

a. Signs and symptoms:

(1) Patient has "fullness" of the ear feeling and mild loss of hearing.

(2) Mild pain.

(3) Retracted TM, amber colored fluid behind TM, TM may be pink to blue, and land marks behind TM may be obscured.

(4) Fever if another infection is present.

(5) It is possible to have chronic serous otitis media (especially in children) with resultant dysfunction of the middle ear.

b. Treatment. Same as acute purulent otitis media.

4. Acute purulent otitis media. Follows ascending infection from pharynx; e.g., into serous otitis media. Usually gram positive infection.

a. Signs and symptoms:

(1) Pain in the ear. May be manifest in a child by pulling at the ear.

(2) Decreased hearing.

(3) Fever, nausea or vomiting, and malaise. Red and bulging TM. May have pus behind TM. TM may perforate. Will heal spontaneously without hearing loss. Loss of landmarks behind TM.

b. Treatment:

(1) Open the eustachian tube and kill the bacteria.

(2) Systemic antibiotic.

(3) Antihistamine.

(4) Neosynephrine nose 3 qtts every three hours.

(5) ASA or darvon compound.

(6) Keep treatment going at least seven days.

5. Hearing losses:

a. Acoustic trauma. This is due to loud sounds. Loss of high frequencies from damage to VIIIN may be temporary or permanent.

b. Cerumen impaction. There is no loss of hearing until canal is completely closed; therefore, this condition produces sudden loss of hearing.

c. Treatment. Remove the wax by cerumenex H_2O_2 wash, or ear curette.

6. Dizziness. Patient may mean light headedness as in fainting or true vertigo.

D. Throat:

1. Acute tonsillitis. Usually gram positive bacteria, often strep (B. hemolytic).

a. Signs and symptoms:

(1) Sore throat and dysphagia.

(2) Headache, malaise, and fever.

(3) Referred pain to the ear.

(4) Tonsils swollen and red. Pus may be on the tonsils.

(5) Cervical lymphadenopathy is tender.

(6) Fetid breath. May procede to abscess of the mouth; e.g., peritonsillar abscess (quinsy).

b. Treat as with tonsillitis and incise abscess. Insert wedge between upper and lower teeth to avoid bite reflex. Hold tongue out of mouth by wrapping with gauze. Make a quick scalpel stab (not a needle) at least 3/8 inches long into the abscess. T&As only indicated with repeated tonsillitis; e.g., five times per year or recurrent otitis media due to enlarged tonsils.

2. Acute pharyngitis. Due to viral or bacterial infection frequently B. hemolytic Strep.

a. Signs and symptoms:

(1) Sore throat and dysphagia.

(2) May have fever.

(3) Pharynx looks red. Pus sometimes in the pharynx.

(4) Scarlet fever, a fine macular rash especially in flexar surfaces due to the exotoxin of streptococcus and present at the same time as the sore throat. Streptococcal infections may produce two hypersensitivity reactions. (Glomerulonephritis and rheumatic fever.) Therefore, suspect strep infections must be treated with vigor.

b. Treatment:

(1) Treat with antibiotics (penicillin - systemically for ten days) if there is pus, severe redness or severe soreness.

(2) Warm gargle q.i.d.

(3) ASA, fluids, and rest.

3. *Diphtheria. This is usually a pharyngitis with high mortality caused* by cornybacterium diphtheria (a gram positive bacteria).

a. Signs and symptoms:

(1) Gray, homogeneous membrane on the pharynx.

(2) Sore throat.

(3) Patient looks too sick for usual pharyngitis.

(4) Malaise, fever. nasal discharge, and hoarseness.

(5) Pulse fast and thready. Under the membrane is an ulcerated base *that bleeds easily. Can procede to myocarditis or neuritis.*

b. Treatment. Don't wait to confirm this diagnosis by lab culture if *you suspect it.*

(1) Start IV. IV penicillin at least five million a day.

(2) Diphtheria antitoxin at least 10,000 u IV in a single dose.

(3) Remove the membrane by pulling it off, remember to wedge between jaws.

(4) Isolate and support. Cricothyroid prn.

4. Infectious mononucleosis. A viral infection spread by cough.

a. Signs and symptoms:

(1) Malaise and fatigue.

(2) Sore throat.

(3) Posterior cervical lymphadenopathy (behind the sternoclido mastoid muscle).

(4) Slight fever.

(5) Possible splenomegaly.

(6) Can procede to hepatomegaly, jaundice, neuritis, and death.

(7) Increase in lymphocytes which are atypical in appearance. Originally thought to be monocytes.

(8) Petechial skin rash. May occur in mouth.

(9) Positive heterophile test.

(10) Positive blood agglutination test, requires about 30 minutes for SF medic to run.

5. Mumps. Viral infection of the parotid gland spread by droplets. Incubation as with most viruses is about 14 days minimum.

a. Signs and symptoms:

(1) Produces malaise, anorexia, fever, and sore throat.

(2) Swollen parotid gland (directly in front of the ear). Gland is tender. Stroking the gland produces clear exudate at the duct orifice adjacent to second molar. There is no pus as with a bacterial infection. There will be exudate (there is none with a stone).

(3) Twenty-five percent of adult patients develop complications: orchitis, pancreatitis, meningitis.

b. Treatment:

(1) Support and rest.

(2) Fluids, ASA, soft diet, cold packs to the swelling prn pain, and steroid burst for orchitis.

E. Nose:

1. Nasal fracture. Reset into acceptable alignment early; may inject local anesthetic directly at fracture site to reduce displacement. Stop bleeding. Protect to hold position of fragments.

2. Epistaxis. Nose bleed. May be due to trauma, drying out of a blood vessel, or hypertension.

a. Ninety-five percent from anterior nose (it is compressible).

b. Hold nostrils firmly together for five minutes then leave alone. Patient may be in any common position to do this.

c. If bleeding fails to stop, repeat compression. If compression fails use silver nitrate sticks. Touch bleeding area to chemically cauterize the wound. Epinephrine soaked cotton pledgets may be packed into nose and compression reapplied.

d. If bleeding is found to be in noncompressible area (look with the otoscope) make and insert a posterior pack. One-half inch diameter gauze roll is tied to string at both ends. IV tubing is inserted into the bleeding nostril and drawn out the mouth. The tubing is then drawn out through the nose causing the gauze to enter the mouth and then the posterior nose where it is pulled into position to compress the bleeding. Cut the strings short enough to be comfortable, but not enough to be unable to get pack out through the mouth in 72 hours. Use the anterior string to fasten to anterior pack.

e. Treat hypertension if present with phenobarbital or hydrodiuril or reserpine as this may be causing the bleed. If patient is in hypovolemic shock, treat in the usual manner.

3. Nasal allergy ("Hay fever"). Nasal allergy can occur at any time of the year but tends to be worse during particular high pollen periods as at haying time in the fall.

a. Signs and symptoms:

(1) Itchy or burning eyes. Eyes may appear reddened. Dark lines beneath the eyes.

(2) Nose is stuffy (nose may be uncomfortable). Nose produces clear exudate.

(3) Sneezing may be frequent. Turbinates are swollen, pale, and boggy.

(4) Increased eodinophilis in WBC differential.

b. Treatment. Antihistamines. Generally don't use benedryl because 50 percent of people will get sleepiness. Examples. CTT chlortrimeton 2, 4, or 8mg every four hours; actifed tab † or †† every four hours; dimetapp tab † or †† b.i.d.; and ornade tab † or †† b.i.d.

XXVIII. EMERGENCY DENTAL CARE.

A. Dental Diseases and Their Management.

1. Decay. Destruction of tooth structure by acid produced by bacteria which live on the residue of refined carbohydrates.

a. Treatment:

(1) Evacuate enough of the soft, carious material to undercut the cavity.

(2) Fill the cavity with a zinc oxide-eugenol temporary filling. Zinc oxide is a white powder. Eugenol is a liquid extracted from oil of cloves, and oil of cloves can be used as a substitute for eugenol. Mix the eugenol and zinc oxide to a putty-like consistency.

b. Prevention:

(1) Proper brushing techniques and flouride toothpaste.

(2) Eliminate foods high in refined carbohydrates (sugar, breads, etc.) and soft starchy foods.

(3) Eat raw, rough foods that act as a natural tooth brush. Eat a high protein diet.

2. Peridontal disease. Caused by excessive calculus. Treated by sealing and cleaning the teeth. If very severe, irrigation and drainage may be necessary, and if abcesses occur antibiotics may be required (penicillin).

3. Vincent's disease (trench mouth):

a. Recognition. Eroded gum tissue next to the teeth and punched out interdental papilla, covered by a grey-brown pseudomembrane. It is very painful and foul smelling, and can be debilitating, interfering with a patient's ability to eat.

b. Predisposing factors. Include fatigue, emotional stress, local irritants, and poor dental hygiene.

c. Treatment. Includes scaling, improved personal oral hygiene, and penicillin (if not allergic) 600,000 units q.i.d.

4. Abcesses:

a. Pericoronal:

(1) Recognition. Excess gingival tissue covers the tooth (most often the lower third molars) and is red and tender. Jaw muscles may be stiff and opening the mouth may be difficult.

(2) Treatment.

(a) Irrigate with warm saline.

(b) Incise and drain.

(c) Scale involved tooth.

(d) Apply heat to reduce swelling.

(e) In severe cases use penicillin (if not allergic).

b. Periapical:

(1) Recognition. Pain and swelling, with the tooth sensitive to hot and cold and to percussion (tapping the tooth with a mirror handle).

(2) Treatment:

(a) It may be possible to excavate through the crown of the tooth to the pulp to relieve the pressure and drain the abcess through the tooth.

(b) Incision and drainage through the gum should be done when the abcess can be located visually or by palpation. The swelling is most often found on facial side of the upper teeth and on the lingual side of the lowers opposite the root end of the affected tooth. Incision can be done with a scalpel or a large hypodermic needle. Do not incise at the mid portion of the swelling or make a vertical incision. Make the incision at the most dependent part of the swelling. Insert iodoform gauze or substitute into the incision to keep it open.

(c) Extraction may become necessary, but be sure to extract the right tooth. Percussion and response to heat and cold stimulation are tests to use.

(d) Antibiotics may be used, but usually incision, drainage, or extraction will solve the problem.

5. Fractures of the jaw. Recognition includes history, improper tooth alignment, pain, and examination. Treatment includes temporary immobilization with a head wrap, symptomatic therapy, and evacuate.

6. Dislocated mandible. Recognized by mouth being locked open and pain. Treatment includes:

a. Stand behind patient.

b. Wrap your thumbs in a towel.

c. Place thumbs on molars and fingers under the point of the chin.

d. Push down with the thumbs and up with the fingers and move the mandible back into place.

7. Maxillofacial wounds-treatment:

a. Control hemorrhage. Careful clamping of bleeding points to avoid unnecessary destruction of tissue.

b. Maintain airway.

c. Apply protective dressings.

d. Do not displace or twist any flaps of tissue.

e. Antibiotics.

f. Evacuate as soon as possible.

B. Dental Anesthesia:

1. General. Xylocaine, two percent with 1:100,000 epinephrine is used. Abscessed or infected tissues will lessen the effectiveness of dental anesthesia. Reactions to xylocaine are rare, but it may cause some drowsiness. Good technique decreases injection and post injection discomfort. Do not:

a. Use cold solution.

b. Use contaminated solutions or syringes.

c. Inject too rapidly.

d. Use numerous needle punctures.

e. Inject into muscles.

f. Wave syringe in patients face.

g. Inject into infected tissue (if possible).

h. Fail to aspirate before injecting.

i. Fail to inquire about allergies to drugs used.

2. Maxillary injections:

a. Maxillary teeth can be anesthetized by infiltration around the tooth.

b. For routine work infiltration from the facial side is adequate.

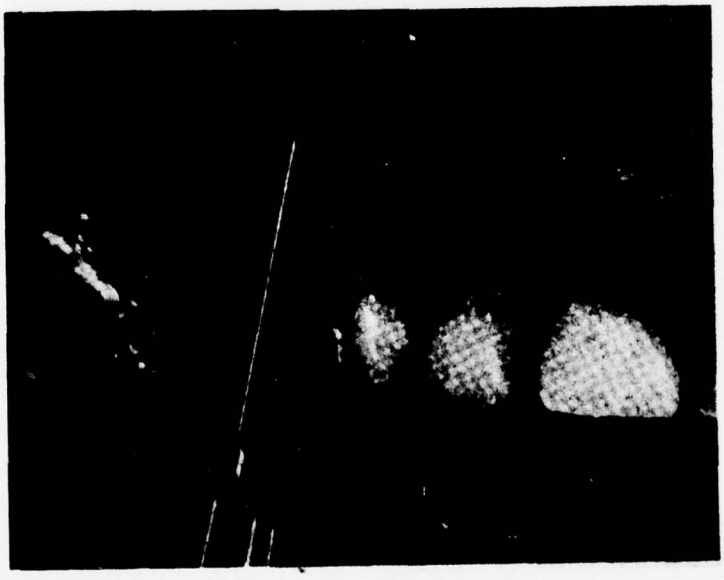


Figure 1

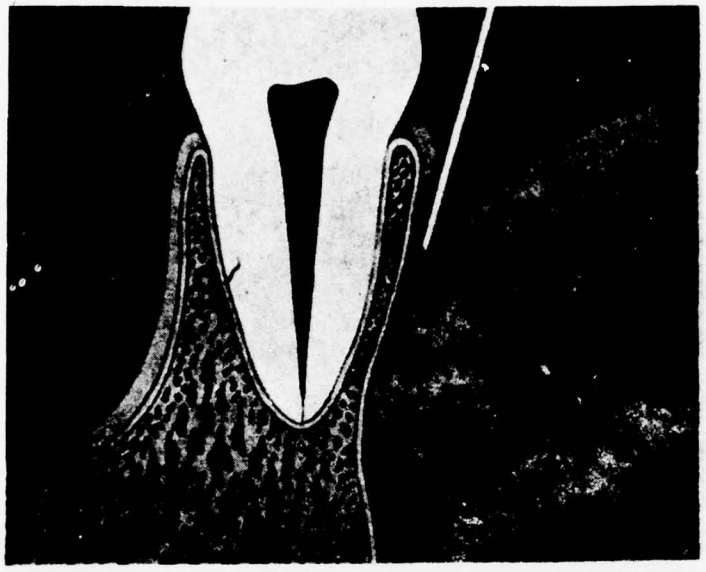


Figure 2

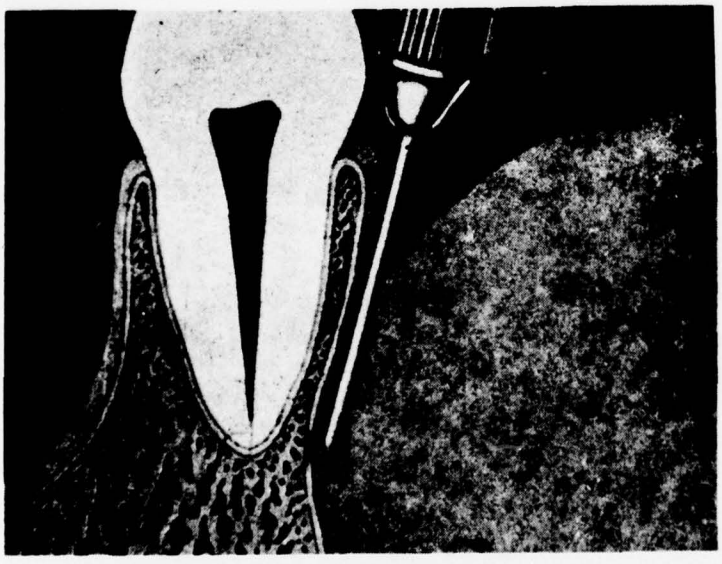


Figure 3

c. For extractions both facial and lingual injections are required.

d. Technique (See Figures 1-3). Place needle in buccal fold opposite desired tooth. Insert needle until its tip is opposite the root end and inject.

e. Palatal injections are quite painful but are necessary for surgery. Inject at the lingual side of tooth at the junction of alveolar and palatine bones. (See Figures 5 and 6). For anterior teeth inject the naso palatine nerve branches along side of the incisive papilla, just posterior to the central incisors. (See Figure 4.)



Figure 4

f. For partial palatine injection, inject at the junction of the palate and alveolar bone at the lingual side of the second molar. (See Figures 5 and 6.)



Figure 5



Figure 6

3. Mandibular injections. Mandibular anesthesia required for operative procedures can be obtained from a mandibular, mental, or anterior infiltration block. Anesthesia for extraction requires a mandibular block, long buccal block, and perhaps a mental block. Lower anteriors will require infiltration. Techniques for these blocks follow:

a. Infiltration is used only for the lower incisors. Make the needle puncture at the muco-facial fold. The lower incisors have fairly short roots - do not inject the needle too deep.

b. Mandibular block technique (See Figures 7-9).

(1) Have patient open wide.

(2) Palpate the anterior border of the ramus of the mandible with the thumb of the free hand and locate the notch.

(3) Locate the trianqular depression distal to the molar area, whose apex points downward.

(4) Make the puncture at the apex of the triangular depression at the level of the center of the thumb.

(5) Line up the syringe opposite the bicuspids and advance the needle to the center of the ramus (about 15mm) and inject.



Figure 7



Figure 8



Figure 9

c. Mental injection technique (See Figures 10-12):

(1) Judge the location of apices of the bicuspids.

(2) Hold the lip away from the teeth.

(3) Puncture at the muco-buccal fold.

(4) Carry needle to the apex of the second bicuspid, inject 1/2cc without withdrawing the needle, and explore until the mental foreman is found - then inject 1cc.

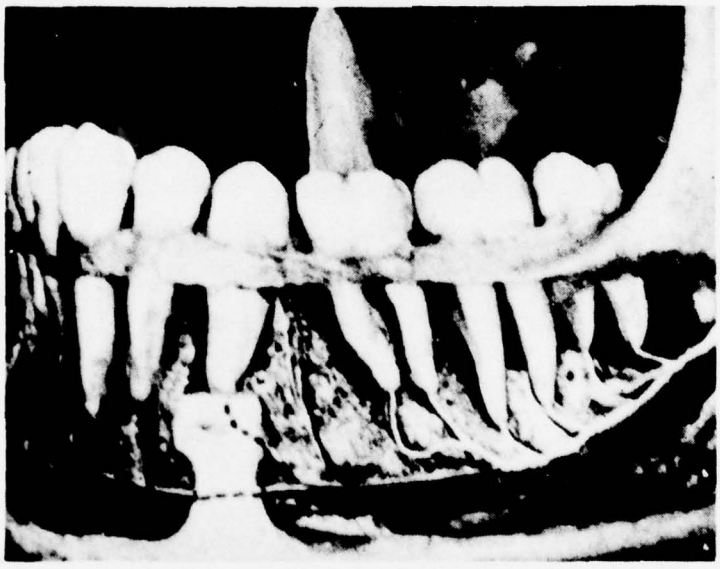


Figure 10



Figure 11

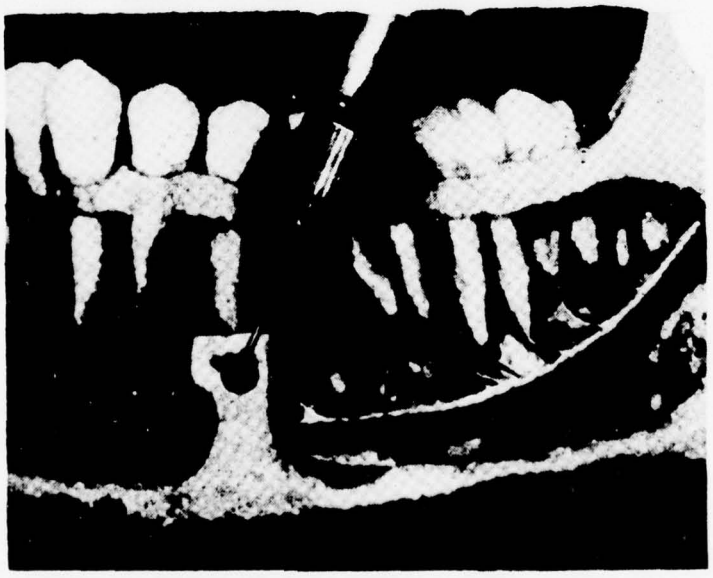


Figure 12

d. Long buccal injection (See Figures 13-15):

(1) Holding needle parallel to the body of the mandible, puncture in the muco-buccal fold opposite the second molar.

(2) Pass the needle distally to the third molar, injecting as you do s.



Figure 13



Figure 14

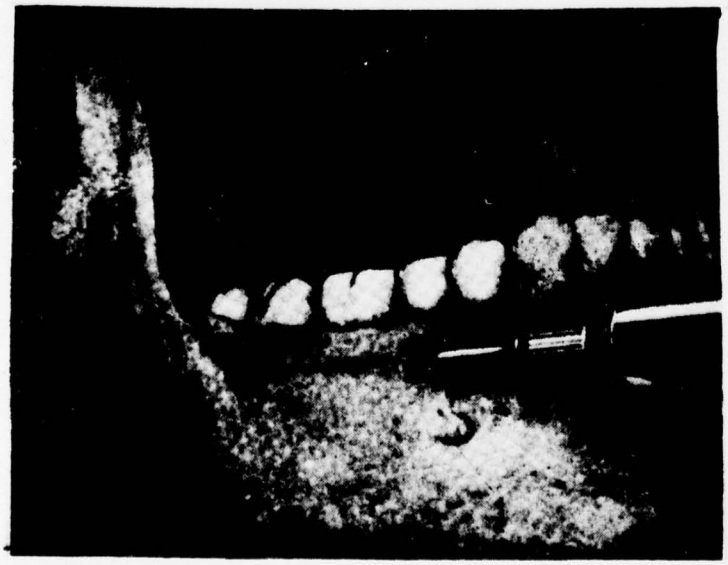


Figure 15

C. Extractions Technique:

1. Attain anesthesia.

2. Strip attached gingiva around tooth with an elevator or excavator.

3. Hold forceps with beaks pointing away from the operator.

4. Position lingual beak first, then facial, and close firmly.

5. Apply even, steady force (no jerks) to tooth first in one direction, then the other.

6. Try to support the alveoler ridge around the tooth with the free hand.

7. Remove tooth in the direction it "wants to go", being careful to avoid an explosive extraction and damaging other teeth. Extraction forces to use with various teeth are as follows:

a. Those with cone shaped roots (six upper anteriors, lower cuspids, and bicuspids) - use primarily rotational force.

b. Those with single flattened roots (four lower anterios, upper second bicuspids) - use primarily facial-lingual movement.

c. Those with more than one root (molars and upper first bicuspids) use primarily facial-lingual movement, with little rotation.

8. If root tips are fractured, and if close to the apex, no additional treatment by the medic is needed, but if fracture occurs close to the crown, try to remove remainder of root by forceps.

9. If "dry socket" (exposed bone with severe pain occurring two to three days after extraction) occurs:

a. Flush the socket with warm saline.

b. Place iodoform gauze soaked with eugenol in the socket.

c. Zinc oxide and eugenol mixed with vaseline (enough to keep paste soft and pliable) and cotton is a substitute dressing.

d. See patient every day to change dressing until healed.

XXIX. BURN THERAPY GUIDE.

A. Concepts of Fluid Management:

1. Fluid and electrolytes shift to burn sites as edema, blisters, and oozing.

2. Lack of fluid and electrolytes around cells may be severe enough to cause shock.

3. Significantly burned patients require fluid replacement.

4. Under 20 percent burns-adults; under 12 percent burns-children and aged; usually no shock.

5. Anemia may develop, unrelated to shock, and treated independently.

B. Practice (Fluids For First 24-36 Hours):

1. Oral fluids are for mild or impending shock:

a. Dissolve in one quart or one liter of water seven salt tablets (NaCl 10gr) and three soda bicarbonate tablets ($NaHCO_3$ 10gr). "Burn Packet" - sodium chloride-sodium bicarbonate mixture, 4.5gm, FSN 6505-663-2636 may be used in place of above. Dissolve contents in one quart of water and administer slowly over a one hour period.

b. Must be iced or cool to avoid vomiting.

c. Given as much as patient will tolerate.

d. Not given in moderate to severe shock.

2. IV fluids for moderate or severe shock.

a. Lactated Ringer's solution.

(1) Best fluid available.

(2) Give sufficient quantities to restore vital signs, urinary output over 25ml/hr in adults, and a clear mental status. (As much as 20 liters have been required in first 30 hours in severe burns.)

(3) Estimate of fluid requirement for first 24 hours: 2 x (% burn up to 50%) x (lbs body wt) = ml. Expect most to be needed in first eight hours.

b. Saline (0.9% NaCl) - with sodium bicarbonate if possible (44meq/1000cc). Use this when Ringers is unavailable.

c. Plasma. Children - badly burned; IV fluids - Ringers 3/4, plasma 1/4. Adults - use only if out of Ringers and saline.

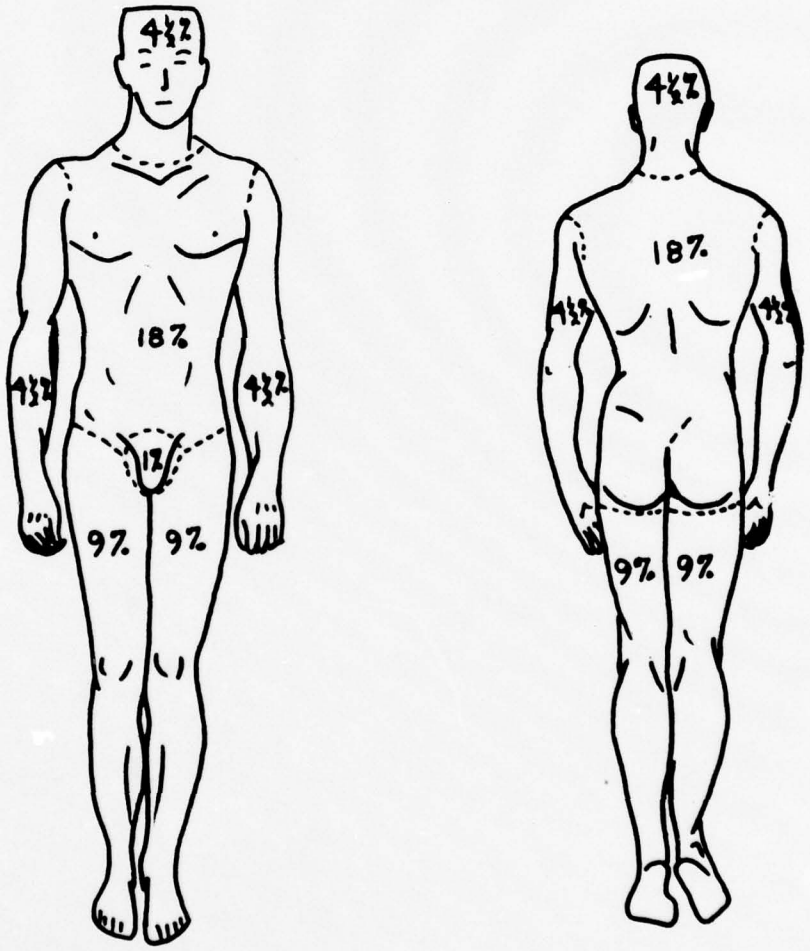
d. Albumin. Children - used in place of plasma. Adults - used if out of Ringers, saline, and plasma.

e. Dextran - used if out of Ringers, saline, and plasma.

f. Dextrose in water is not to be used. The idea in IV fluid replacement is to replace plasma loss with a plasma expander. Dextrose in water is a poor plasma expander and does not replace electrolyte (sodium and potassium) losses. In fact, dextrose in water further dilutes existing electrolytes within the plasma.

RULE OF 9's

ESTIMATE OF BURNED SURFACE



NOTES

APPENDIX 1

VETERINARY RESPONSIBILITIES OF THE
SPECIAL FORCES MEDICAL SPECIALIST

I. INTRODUCTION. In remote areas, the veterinary responsibilities of the Special Forces aidman are food procurement and inspection and treatment and prevention of animal disease.

II. FOOD PROCUREMENT AND UTILIZATION. The utilization of indigenous foods under field conditions will present problems in direct relation to the level of sanitation prevailing in the operational area. Care in the selection, use, and preparation of local foods and liquids can make the difference between an effective soldier and a medical casualty.

A. Milk and Dairy Products. Milk and dairy products should not be used unless it becomes absolutely necessary. Should it become necessary to consume milk, it should first be heated to boiling.

B. Meats.

1. Beef. Beef for personal consumption should be fresh, come from healthy animals which are inspected at the time of slaughter, should be handled to protect it against contamination from insects and filth, and should be transported and stored in the most sanitary manner possible. Following the slaughtering and dressing of the animal, the meat should be consumed on the same day unless refrigeration facilities are available or the meat is to be cured. Only thoroughly cooked meat should be eaten. If meat remains red in the center, it has not been thoroughly cooked.

2. Pork. The rules for freshness, health, and cleanliness are the same as for beef. The cardinal rule for pork is "cook thoroughly and eat no pink pork." Only thorough cooking prevents Trichinosis.

3. Poultry and eggs. May be consumed if they are thoroughly cooked. The general rules provided for beef and pork should be followed.

4. Fish, sea foods, and fresh water life. Eat water foods that are known and eaten by the natives, and always eat them fresh. Fish are the only type of water food that should be eaten. Do not eat shell fish. Fish should be thoroughly cooked before eating.

a. Indications of early spoilage:

(1) Sunken eyes.

(2) Flesh pits with pressure.

(3) Sticky surfaces.

(4) Scales removed with ease.

(5) Off odor at the gills and inside the body cavity.

b. A fresh fish has:

(1) Prominent eyes and firm flesh.

(2) Surface will be slimy and scales are not easily removed.

(3) Gills are bright red in color.

(4) No off-odor at the gills or inside the body cavity.

5. Game. Any exotic or wild animal meat should be avoided. Remember that all mammal flesh from healthy animals, except polar bear liver, is safe to eat when properly cooked.

C. Vegetables and Fruits.

1. Vegetables. Washing, peeling, and thorough cooking will render fruits and vegetables safe and wholesome. Do not cook with salad-type vegetables such as lettuce, cabbage, and celery. To chlorinate vegetables, use 75-100 PPM of chlorine in water for 30 minutes.

2. Fruits. Fruits should normally be safe due to their growth above ground. Fruits, to include tomatoes, should be washed, peeled, immersed in boiling water, or cooked before eating. Bananas, oranges, and coconuts, which can be peeled before eating, would be an exception to the above.

D. Staples. Rice, beans, and small grains should be clean and free of rodent contamination, insects, and spoilage. Musty or moldy grains can be used only after thorough cooking. Small grains which have little balls of smut in place of kernels should be carefully screened and discarded. A serious disease, ergotism, can follow consumption even after cooking or baking.

E. Liquids. Do not drink local water or use local ice unless approved by competent medical authorities. In order to achieve rapport with the natives it may become necessary to drink alcoholic beverages, but remember it isn't recommended.

III. FOOD INSPECTION.

A. Ante-mortem Inspections. An ante-mortem inspection is simply the examination of live animals.

1. The purpose of conducting ante-mortem inspections is to detect conditions or diseases which might not be evident after the animal has been slaughtered.

2. Under normal non-emergency conditions, the following conditions may render animals unfit for slaughter:

a. A purulent nasal discharge.

b. Bloody diarrhea.

c. Extreme emaciation.

d. High body temperatures, above 105° (106° for hogs).

e. A general listlessness.

f. Inability to rise or walk.

g. Nerologic signs as circling in one direction or pressing of head against a fixed object.

h. Those affected with rabies, tetanus, anthrax, generalized edema, and any condition rendering the animal moribund or comatose.

B. Post-mortem Inspections Using Systematic Guidelines:

1. Lymphatic system. The lymphatic system is the key to all post mortem inspections. Proper examination of a lymph node includes incision of the node as well as a gross examination. Lymph nodes are generally the same color throughout the body. The color resembles coffee with a good deal of cream in it. If an abnormal lymph node is found, it is an indication that the organ or muscular area drained by the node is affected. Abnormalities of lymph nodes include inflammation (bloody or rosy in color), calcification, purulent exudation, swelling, and hardness.

2. Thoracic Viscera. Examine the diaphragm for presence of the parasitic infestations. Examine the lungs and lymph nodes which drain them for:

a. Adhesions.

b. Abnormalities.

c. Abscesses.

d. Growths within the pleural cavity. Make several large incisions into each lobe of the lung to check for the presence of purulent exudate. Open the pericardial sac and remove the heart. Visually examine, palpate, and split open the walls of the ventricles and examine for parasites.

3. Abdominal Viscera:

a. Examine the liver and gall bladder.

(1) Make a transverse incision through the length of the bile duct.

(2) Normally, the liver should be a light chocolate brown to a slightly darker brown in color.

(3) Abnormalities in the liver include growths, adhesions, abscesses, and cirrhosis.

b. Examine the mesentery, colon, and respective lymph nodes.

c. Examine the spleen.

(1) Normal color, outer surface, bluish-white with gray flecks on the outer surface.

(2) When incised, a deep red mulberry color speckled with particles of blue-gray.

(3) Normal texture is firm and pliable.

(4) Should any abnormalities be found in the spleen, it is an indication of a secondary invasion in one of the systems. If it is soft, spongy, or degenerated, it is an indication of a possible infection. In this event the carcass should not be used.

d. Examine the kidneys for parasitic infection as well as any inflammation. Ruminant kidneys have the normal anatomical appearance of a mulberry.

4. Inspection of the head. Incise the large external cheek muscle to check for parasites. Remove the tongue and palpate for abnormalities and for parasites.

5. Rules of thumb:

a. The cardinal rule for both ante-mortem inspections and post-mortem inspections is "when in doubt, throw it out".

b. Do not slaughter animals that are in the last month of pregnancy or ten days after having given birth.

c. When one or two organs are affected or show signs of disease, do not dispose of the whole carcass. Do not condemn a whole carcass for localized conditions affecting only one quarter. Any animal showing signs of icterus or edema should be considered inedible.

d. Under field conditions, it is best to consume only the muscular tissue and discard the internal organs. When the choice is between going hungry and eating parasitized beef, the following rule may be applied: Cook the parasitized meat thoroughly until no pink shows.

6. The following signs upon post-mortem should be considered to rule out the animal for consumption:

a. Acute inflammation of the lungs, pleura, pericardium, peritoneum, or meninges.

b. Gangrenous or severe hemorrhagic enteritis or gastritis.

c. Pus in the uterus.

d. Inflammation of the umbilical veins.

e. Pus or foreign bodies (nails, barbed wire) around the heart.

IV. VETERINARY MEDICINE.

A. General. A rural family's entire existance may hinge upon a few animals they possess and a possible religious significance may be attached to the life of each animal. Therefore, in remote areas any service which affects the health of the animal population will at the same time have a profound psychological impact upon the people. Of the approximately 3000 diseases of animals, 100 can infect man. More significantly, of the 92 diseases of man considered to be serious public health problems, 40 are transmitted by animals. Therefore, many of the infectious diseases encountered by a medic will have involved an animal as a carrier in the transmission cycle. The medic should make an effort to ascertain the following information before deployment into the operational area:

1. What are the main animal diseases of serious public health or economic consequence in the UWOA?

2. Are there vaccines available for these diseases? If so, what is the best time to vaccinate the animal and under what conditions?

3. What are the main clinical signs of each disease? Why systems or systems does the disease usually involve?

4. How is the disease transmitted and what agents or animals serve as a reservoir for this disease? For example: fox, skunks, and bats serve as reservoirs in the transmission of rabies.

5. What is the recommended treatment? Ideally, the medic's best source of information would be the group veterinarian or any other armed forces veterinarian. If no military veterinarian is available, the local veterinarian or animal husbandry specialist may be considered. However, in many countries, the level of education of these individuals is not very high.

B. Treatment of Individual Animals. In medicine the basic principles remain the same regardless of the species involved. Allowing for species variation, the medic is encouraged to conduct the physical examination of an animal in much the same manner as he would a physical examination of a person. The following observations should be made:

1. Examine the subject from a distance noting any gross abnormalities or discrepancies.

2. Make an attempt to isolate the system of systems involved. Does this disease involve the digestive, respiratory system, or circulatory system?

3. Check the membranes in the mouth, vulva, and sclera for signs of icterus and anemia.

4. Using stethoscope and thermometer, obtain a rectal body temperature reading and listen to both the lungs and heart for abnormalities.

5. In obtaining the diagnosis, keen observation should augment with the other four senses.

6. The following may be of assistance:

	Horse	Cow	Pig	Sheep	Dog	Goat
Body Temp. Range °F±1°	100.5	101.5	102	103	102	104
Average respiration/min	12	20	13	16	20	
Average pulse	40	60	70	75	90	

7. Daily therapeutic antibiotics dosage (large animals):

a. Penicillin 5,000-10,000 units/pound - IM.

b. Streptomycin 5-20 mg/pound - IM.

c. Sulfas 60 mg/pound - IV.

d. Tetracycline 5-10 mg/pound - IM.

e. Chloetetracycline 2-5 mg/pound q 12 hours - IM.

f. Chloramphenicol 20-25 mg/pound - IV.

8. An average dog will take approximately the same level of treatment as a six year old child.

9. If it should ever be necessary to tranquilize an animal, use an adequate amount via IV or IM routes. If given IM, one must wait about 30 minutes for the full effect of tranquilization. If given IV, the waiting time is about ten minutes. The most common tranquilizer available to the Special Forces Medic is Thorazine. Thus, in the case of a large animal, give 0.5mg/50 pounds.

APPENDIX 2

PERIODIC MEDICAL REPORT FROM OPERATIONAL AREA

I. INTRODUCTION. The frequency and contents of periodic reports will be determined by the SFOB depending upon the tactical and medical situation. The detachment will receive definitive guidance on these reports prior to infiltration. Information required will be that which is deemed highly important and rapidly changing.

II. HEALTH OF THE COMMAND

A. Casualty Rate:

1. From wounds. List types and disposition.

2. From disease. List types and disposition.

B. Ineffective rate. Include number and causes.

C. General physical condition of the command.

III. TRAINING STATUS:

A. New training programs since last report.

B. Change in number of trainees.

C. Change in number of "graduates" from training programs.

D. Adequacy of training aids.

IV. MEDICAL SUPPLY STATUS:

A. Stocks reduced to critical level.

B. Degree of success with supply procurement within the operational area.

C. General condition of supplies and equipment following air resupply drops.

D. Loss of supplies to the enemy.

V. MEDICAL PROGRAM:

A. New projects since last report.

B. New facilities.

C. Loss of facilities to the enemy.

D. Any serious medical problems.

E. Number casualties being cared for in facilities belonging to friendly forces.

VI. GUERRILLA AND CIVILIAN MEDICAL PERSONNEL AIDING FRIENDLY FORCES.

A. Full time. Include new personnel (number and skills) and effectiveness.

B. Part time. Include new personnel (number and skills) and effectiveness.

VI. SPECIAL PROBLEMS.

APPENDIX 3

OUTLINE FOR MEDICAL AREA STUDY

I. GENERAL. Brief summary of nation's health status.

II. ENVIRONMENTAL HEALTH FACTORS:

A. Topography and Climate. Include effects on health, medical evacuation, and logistics.

B. Socioeconomic Features:

1. Demography. Include population, ethnic groups, life expectancy, and infant mortality.

2. Living conditions.

3. Nutrition. Include facilities for refrigeration and food inspection programs.

4. Customs and religion.

5. Addictions.

C. Sanitary Engineering:

1. Water supply:

a. Method of supply.

b. Location.

c. Treatment.

d. Health hazards.

2. Waste disposal.

3. Pollution problems.

D. Fauna of Medical Importance. Include disease vectors, hosts, reservoirs, poisonous reptiles,, snakes and spiders.

E. Flora of Medical Importance. Include poisonous plants, plants having medicinal value, and edible plants useful in survival situations.

III. EPIDEMIOLOGY.

A. General. Include prevalent diseases and contributing factors.

B. Diseases of Military Importance. Include communicable diseases and cold and heat injury.

C. Diseases of Animals. Include prevalent diseases, diseases transmissable to man, and preventive veterinary medicine programs.

IV. PUBLIC HEALTH SERVICES.

A. Organization, Administration, and Public Health Laws.

B. Programs and Social Services.

C. Emergency Medical Services and Civil Defense.

D. Capabilities.

E. Medical Personalities of Significance.

V. MILITARY MEDICAL SERVICES.

A. Organization and Administration.

B. Policies and Programs.

C. Standards of Physical Fitness.

D. Logistics.

E. Capabilities.

VI. MEDICAL FACILITIES. Include hospitals, medical laboratories, and blood banks.

VII. MEDICAL PERSONNEL AND TRAINING.

VIII. MEDICAL MATERIAL. Include production capability and stock piles.

IX. RESEARCH AND DEVELOPMENT. Include civilian and military.

APPENDIX 4

AREA MEDICAL ASSESSMENT

I. GENERAL.

A. Purpose and Characteristics. An area medical assessment is the immediate and continuing collection of medical information begun after infiltration into the operational area. Characteristically it:

1. Confirms, corrects, or refutes medical intelligence of the area acquired previously.

2. Is a continuous process.

3. Forms the basis for medical operations and logistical planning for the area.

4. Includes information on the enemy medical situation, weather, and terrain.

5. Includes medical information concerning the civil population within the operational area.

B. The results of the area medical assessment should be transmitted to the SFOB only when there exists significant deviation from previous intelligence.

II. INITIAL AREA MEDICAL ASSESSMENT. This includes that medical information deemed essential to the operational detachment immediately following infiltration. These requirements must be satisfied as soon as possible after arrival in the operational area and should include:

A. Detachment Physical Condition.

B. Medical Status of Local Resistance Elements.

C. Identification of any Immediate Threats to the Health of the Command such as epidemics and unfavorable environmental conditions (weather, terrain, lack of sanitation, and food and water problems).

III. PRINCIPAL AREA ASSESSMENT. The principal assessment, a continuous operation, includes those collection efforts which support the continued planning and conduct of medical operations. Close coordination with the detachment S-2 must be maintained.

A. Enemy Medical Situation:

1. Medical organization.

2. Location of medical facilities including supply points.

3. Standards of medical treatment.

4. Estimated casualty rates from combat and disease.

5. Possibility of disrupting enemy preventive medicine programs.

B. Enemy Attitudes Toward Guerrilla Medical Facilities. Include the treatment of captured guerrilla medical facilities and personnel and the efforts expended in counterguerrilla operations against guerrilla medical facilities.

C. Environmental Factors Affecting Health. Include weather, terrain, acclimatization, and sanitation problems.

D. Indigenous Population:

1. Attitudes towards detachment medic and western medicine.

2. Medical taboos and beliefs not previously known.

3. Birth and death rates.

E. Local Medical Service:

1. Guerrilla medical service:

a. Facilities and programs.

b. Supplies and equipment.

c. Organization.

d. Training.

e. Personnel (type and number).

f. Personalities.

g. Effectiveness (overall and specific units).

h. Standards of medical care compared to US.

2. Civil medical service:

a. Hospitals. Include location, bed capacity, specialty, ownership, and availability of each to friendly forces.

b. Medical treatment facilities other than hospitals (government dispensaries, etc.). Include location, bed capacity, specialty, ownership, and availability of each to friendly forces.

c. Pharmacies and medical supply houses in area. Include location, type supplies available, ownership, and availability.

d. Type medical transportation available. Include type, location, ownership, availability, reliability, and amount of security each affords.

e. Medical training centers (numbers, location, possibilities of recruiting students/graduates to aid guerrillas). Include medical, dental, veterinary, pharmacy, and nursing schools.

f. Civilian medical personnel in operational area available to aid guerrillas in some respect and how: list each by name, specialty, capability, and reliability.

g. Standards of civilian medical care compared to US.

F. Water (Urban and Rural). Include location, treatment necessary to make potable, and quantity available. List any surface water deemed unfit for bathing.

G. Sanitation. List areas where lack of sanitation is significantly affecting the health of the civilian population and where sanitation problems would affect the conduct of military operations.

H. Diseases of Military Importance:

1. List diseases found in the UWOA, endemic and epidemic, which are affecting or would affect the conduct of military operations in any part of the UWOA (friendly and enemy).

2. List the area where each disease is found and give recommendations for protective measures.

3. Describe specific epidemiology of each where this would aid in protection.

4. List types of poisonous flora and fauna which have caused significant medical problems, their locations, and protective measures.

I. Veterinary Aspects:

1. List economically most important domestic animals.

2. List and describe any significant endemic and epidemic diseases affecting such animals.

3. List animals that are safe sources of food.

4. List any aspects associated with domestic animal which have or would likely affect military operations (taboos or customs having to do with animals, epidemics, etc.).

5. List the names and locations of any veterinarians or veterinary trained personnel available to the guerrilla forces.

6. Ascertain state of health of pack animals being used by friendly forces.

J. Food:

1. List reliable sources of meat and vegetables.

2. List treatment and storage methods required for locally procured foods.

3. Specifically list unreliable sources and foods which have been found to be unsatisfactory.

4. List dietary deficiencies found in the local population.

APPENDIX 5

MISSION BRIEFBACK FORMAT

I. MEDICAL MISSION:

A. Medical Care Including Preventive Medicine Measures.

B. Medical Training to be Carried Out.

C. Civic Action Program.

II. PRE-INFILTRATION PLANNING:

A. Medical Aspects of Weather and Terrain. Include weather, terrain, and acclimatization.

B. Diseases of Military Importance:

1. Cold and heat injuries.

2. Prevalent communicable diseases.

3. Poisonous flora and fauna. Include poisonous reptiles, insects, and plants.

C. Preventive Medicine and Health Measures to be Employed:

1. Field sanitation.

2. Water. Include sources and purification methods.

3. Food inspection and processing standards.

4. Immunization standards.

5. Nutritional standards and survival diet.

III. CBR WARFARE SITUATION. Include friendly and enemy.

IV. MEDICAL LOGISTICS.

A. Medical Nets. Include evacuation with UWOA and medical supply.

B. Initial Supply Requirements.

C. Medical Resupply Requirements.

1. From SFOB.

2. Sources from within UWOA. List auxiliary, underground, and guerrilla sources.

D. Medical Evacuation from UWOA. Include routine and emergency.

V. MEDICAL INTELLIGENCE.

A. Friendly:

1. Medical facilities in the UWOA.

2. Medical personnel in the UWOA.

3. Standards of care and training.

4. Medical taboos and beliefs.

B. Enemy Medical Service:

1. Medical service in combat arms.

2. Separate military medical support units and facilities.

3. Military medical supply facilities.

4. Types of medical equipment and supplies.

5. Standards of care and training.

C. Medical Essential Elements of Information (EEI).

VI. PERIODIC MEDICAL REPORTS.

A. Emergency. Include serious health problems affecting the command and medical disasters.

B. Routine.

APPENDIX 6

MEDICAL AFTER ACTION REPORT FORMAT

I. REFERENCES.

II. MISSION.

III. GENERAL.

A. Essential Data.

1. Medical personnel.

2. Total personnel supported.

3. Terrain and climate.

4. Main medical problems encountered.

B. Medical Support Provided:

1. Organization and deployment.

2. List of major medical equipment and drug chests.

3. Holding capability.

4. Support medical facilities, civilian and military. List and describe each regarding bed capacity, capabilities, specialists represented, and exact location and distance from operational area.

C. Medical Evacuation Plan.

D. List of Patients and Diseases Treated.

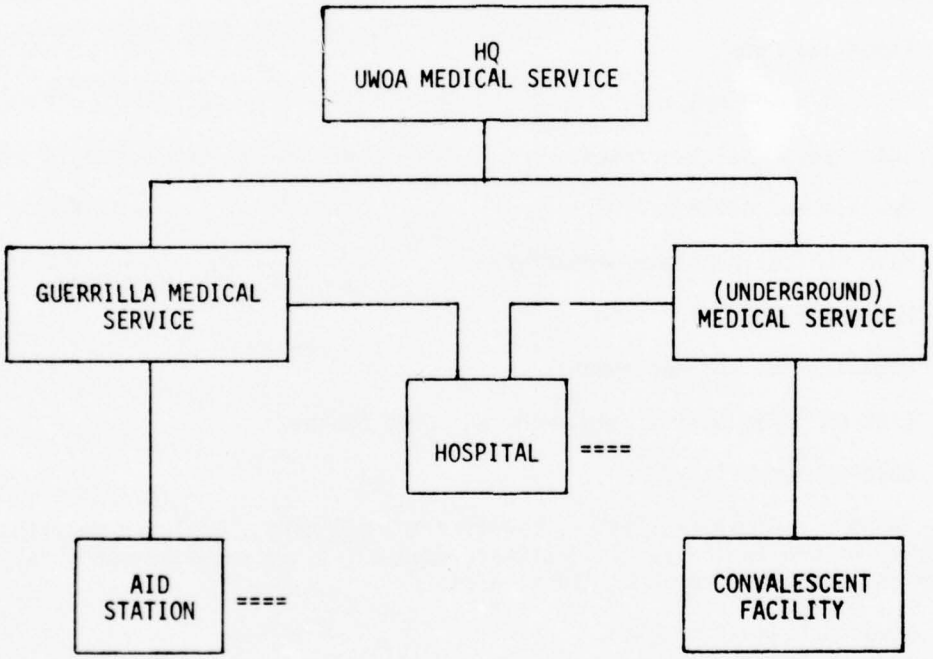
IV. LESSONS LEARNED.

V. PROBLEM AREAS AND RECOMMENDATIONS. Each problem should be stated and a recommendation should follow where possible.

VI. MISCELLANEOUS.

APPENDIX 7

UWOA MEDICAL SERVICE ORGANIZATION



==== FLOW OF EVACUATION

APPENDIX 8

CLANDESTINE HOSPITAL ORGANIZATION

I. INTRODUCTION. This organizational plan is based upon the premise that personnel from a Special Forces "A" Detachment and a Special Forces Company Medical Operations Section (Augmented) would be combined for such a mission. With a few alterations this plan would serve as a guide for association of such a Medical Operations Section (Augmented) with a "B" or "C" Detachment.

II. MISSION. Select potential hospital sites, establish a hospital at the most likely site (based on latest intelligence and security), and organize and operate the hospital.

III. PLANNING. In addition to special plans for selecting special equipment and medicine for hospital operations, the SFOD will prepare complete plans for unconventional warfare operations from the isolation to the demobilization phase.

IV. AUGMENTATION. When assigned the mission of clandestine hospital operations in a UWOA, the SFOD will be fully staffed in accordance with current TOE and augmented with at least the following personnel (SF COMEDOPSEC augmented).

A. Two Medical Officers (CPT, MC, MOS 33100).

B. One Medical Supply and Operations Officer (1LT, MSC, MOS 33506).

C. One Medical Operations Sergeant.

D. Two Medical Specialists.

E. One Laboratory Technician.

F. One Medical Supply Specialist.

G. One Preventive Medicine Specialist.

H. One Clerk.

V. ORGANIZATION. To insure the uninterrupted operation of the hospital and its related phases, the following organization will be effected:

A. Command Group:

1. SFOC Commander.

2. Senior medical officer.

3. SFOC executive officer.

4. Guerrilla chief (medical).

5. Assistant guerrilla chief (medical).

B. Administrative Section:

1. Medical operations sergeant.

2. Clerk.

3. Medical supply specialist.

4. Medical supply and operations officer.

5. Preventive medicine specialist.

6. Guerrillas as necessary.

C. Treatment Section:

1. One medical officer.

2. Two medical specialists.

3. One lab technician.

4. Guerrilla personnel as required by the mission or number of patients.

D. Intelligence Section:

1. SFOC intelligence sergeant.

2. Two guerrillas.

3. Auxiliary personnel as necessary.

E. Operations Section:

1. SFOD operations sergeant.

2. Two weapons NCOs.

3. Three guerrillas.

F. Logistics Section:

1. One engineer sergeant.

2. Three guerrillas.

G. Litter Platoon or Section.

H. Security Platoon. The number of personnel assigned to the security and litter platoons will be based on the local situation.

I. Communications Section:

1. Communications supervisor.

2. Radio operator.

3. Guerrillas as necessary.

VI. RESPONSIBILITIES.

A. Command Group: Command, control, and supervise all sections.

B. Administrative Section:

1. Hospital, patient, and records administration.

2. Reception, treatment, and discharge, coordination, supervision, and control.

3. Hospital sanitation and preventive medicine program.

4. Assist command group and treatment section.

5. Maintain current supply inventory.

6. Request supplies in coordination with S4.

7. Assist in training and security.

8. Advise S2 on medical aspects of medical infiltration and exfiltration evacuation nets.

C. Treatment Section:

1. Operate treatment facility.

2. Maintain necessary drugs and equipment.

3. Keep patient records.

4. Recommend patient status.

5. Assist in routine tasks.

D. Intelligence Section:

1. Supervise security of complex.

2. Establish and supervise the operation of:

a. E and E net (dispersion plan).

b. Medical infiltration, exfiltration, and evacuation nets and routes.

c. Net security (early warning net included).

d. Alternate hospital sites.

3. Establish routine UW intelligence operations including cooperation with detachment medical personnel in gathering medical intelligence.

4. Supervise the security platoon.

E. Operations Section:

1. Plan, conduct, and supervise all training activities.

2. Employ troops.

3. Plan and supervise the conduct of air operations.

4. Establish cache sites and mission support sites.

F. Logistics Section:

1. Organize and operate:

a. SFOD supply mechanisms.

b. Auxiliary supply system.

c. Guerrilla supply.

2. Coordinate with hospital on all logistics efforts.

3. Train and supervise guerrilla supply personnel.

G. Litter Platoon:

1. Transport patients from pick-up points and other areas in medical net operations.

2. Assist in medical net operations.

3. Assist in security.

H. Security Platoon:

1. Maintain security of hospital complex.

2. Occupy defense positions during alerts.

3. Assist in air operations.

I. Communications Section. Organize, train, and supervise:

1. Signal personnel.

2. Clandestine (non-technical) communications nets.

3. Insure complete communications security.

4. Radio nets and sites.

VII. SFOD MEDICAL PERSONNEL. Based on the local situation, the two SFOD medics will be employed to assist hospital operations as deemed necessary by the commander, SFOD, and the hospital commander. This may include:

A. Training Guerrillas as Medical Personnel.

B. Operating Medical Schools.

C. Conducting Sick Call at Locations Other Than the Hospital Site.

D. Assist in Net Operations.

E. Infiltration, Exfiltration, and Evacuation Operations.

F. Gathering of Medical Intelligence.

VIII. ENGINEER SFOD.

A. Construct (Hospital Facilities).

B. Assist in Training.

C. Assist in Security.

IX. REQUIREMENTS.

A. Personnel. Depending on the estimated logistics load and size, between 80 and 150 indigenous personnel will be required to operate a clandestine hospital.

B. Equipment. Operational requirements will dictate sophistication of equipment and supplies. A considerable amount of equipment will have to be obtained from outside group TO&E resources. This includes both communications and medical equipment.

X. ADDITIONAL FACTORS.

A. Reports and Requests. Reports and requests will be submitted in accordance with directives from higher headquarters.

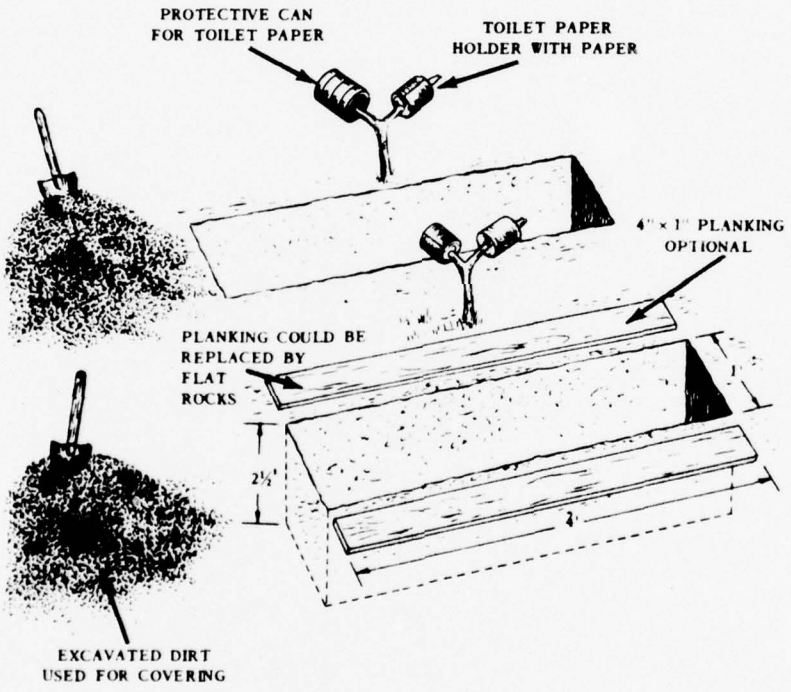
B. SOI, SSI Will Be Modified to Meet the Needs of Medical Supply.

C. All Guerrilla Personnel Will Be Trained in First Aid to the Highest Degree Possible.

D. Augmentation of Medical Personnel from Outside of Group Should Be Forecast By the Medical Officer in Charge of the SFCOMEDOPSEC. These personnel include all types of trained medical personnel from technicians to qualified general surgeons, orthopedists, etc.

APPENDIX 9

STRADDLE TRENCH

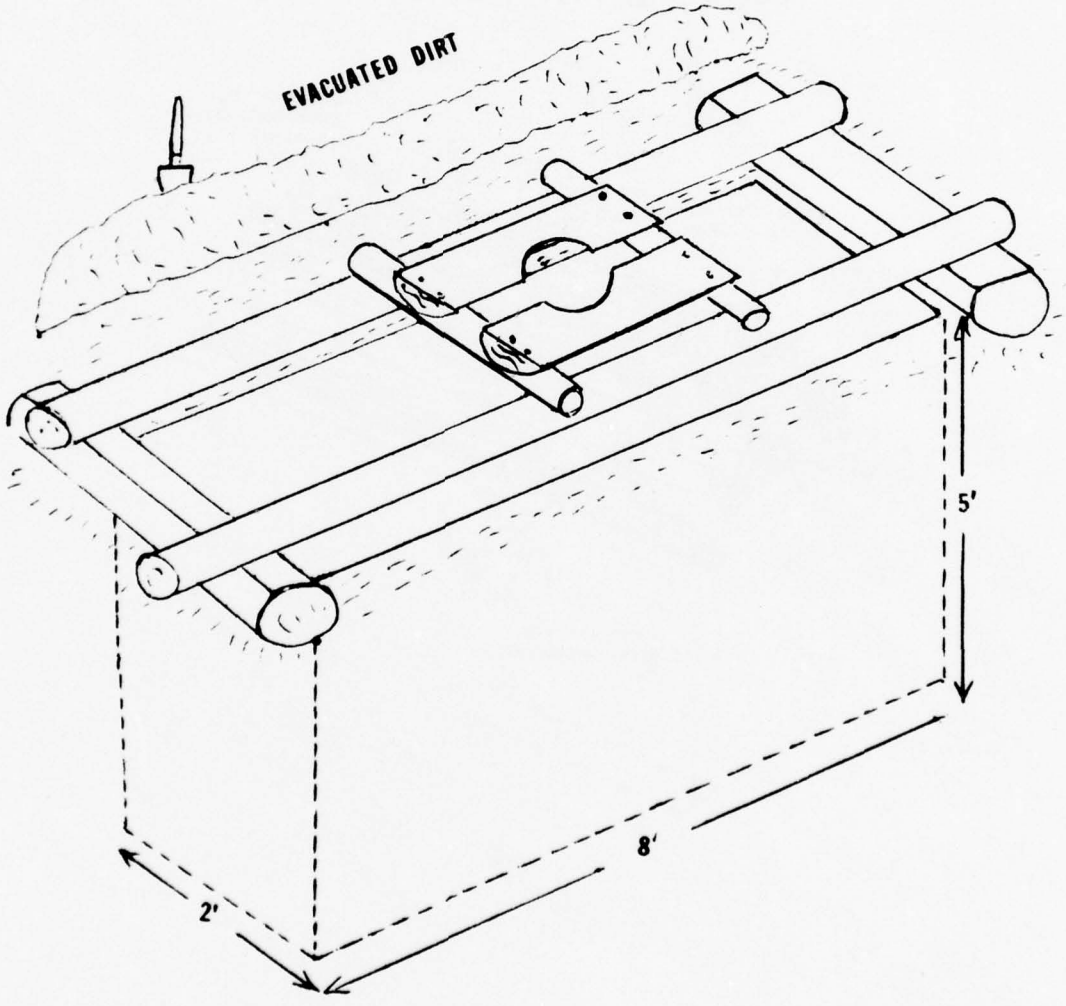


For demonstration area trenches, woodlinings of salvage lumber will prolong the shape of the trench by minimizing crumbling of sidewalls due to weathering. Linings are not required in actual trenches.

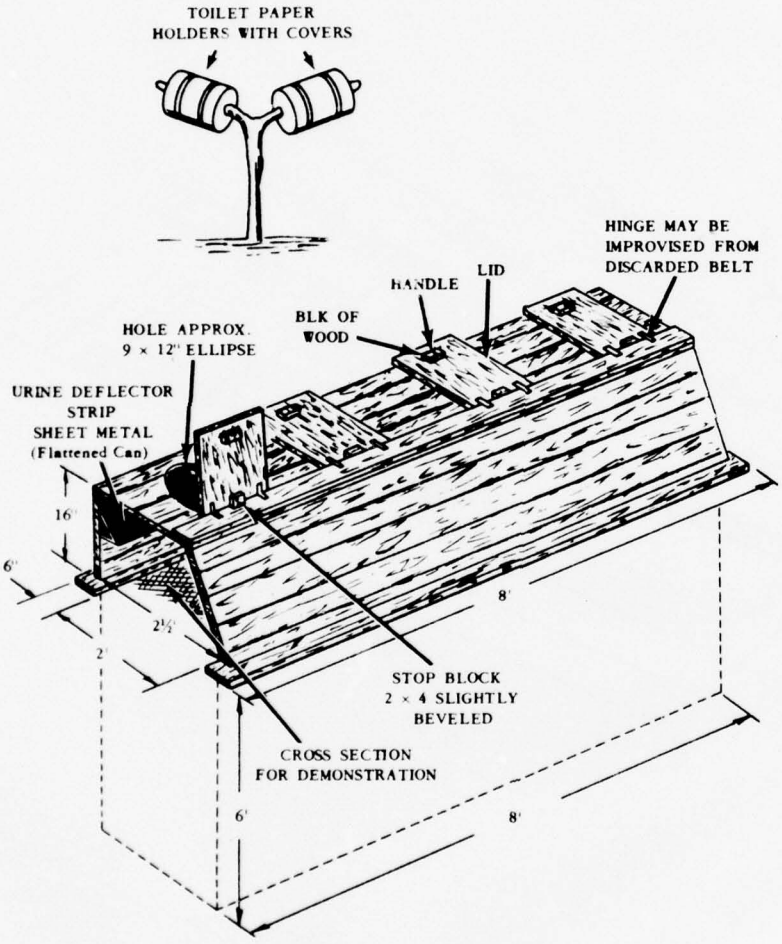
APPENDIX 10

PIT LATRINES

I. OPEN PIT LATRINE.

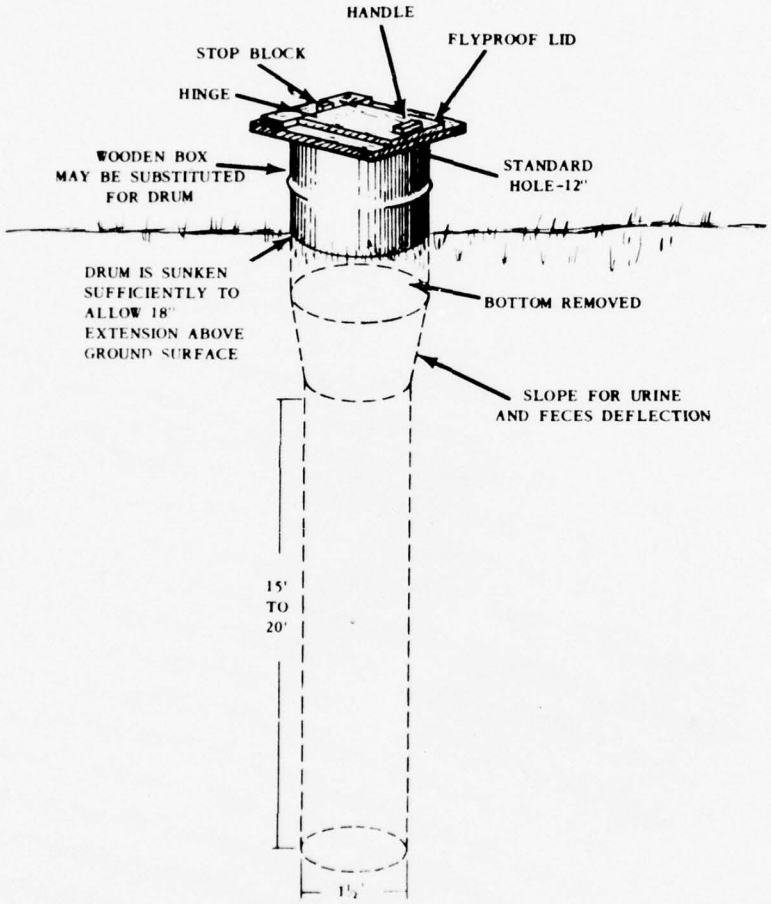


II. DEEP PIT LATRINE.



APPENDIX 11

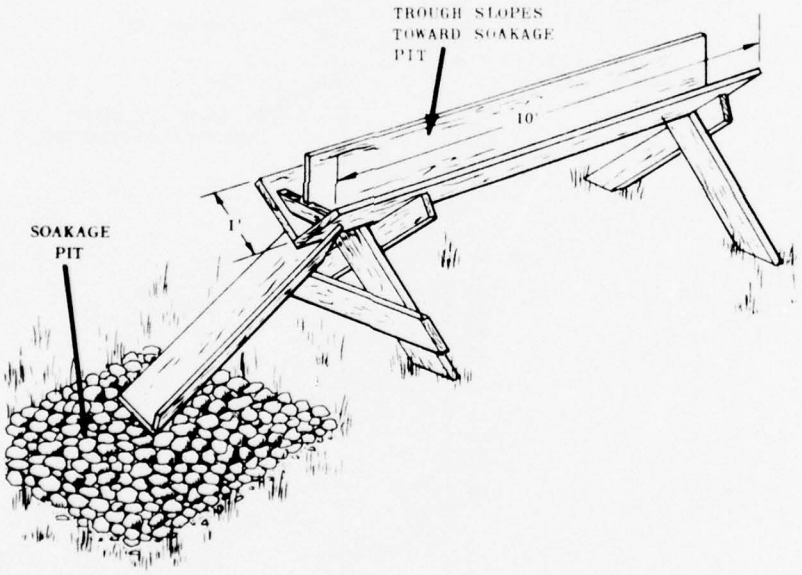
BORED-HOLE LATRINE



The burn-out latrine resembles the bored-hole latrine in that the cover and can are of similar size and structure. The burn-out latrine utilizes a can with bottom. Frequency of burning the waste material out of the can with fuel (diesel fuel is best) depends on frequency of use. This usually is about once daily. Burn-out latrines are best used when the ground is unfit for digging for some reason. Burning waste material protects completely from contamination of water supply.

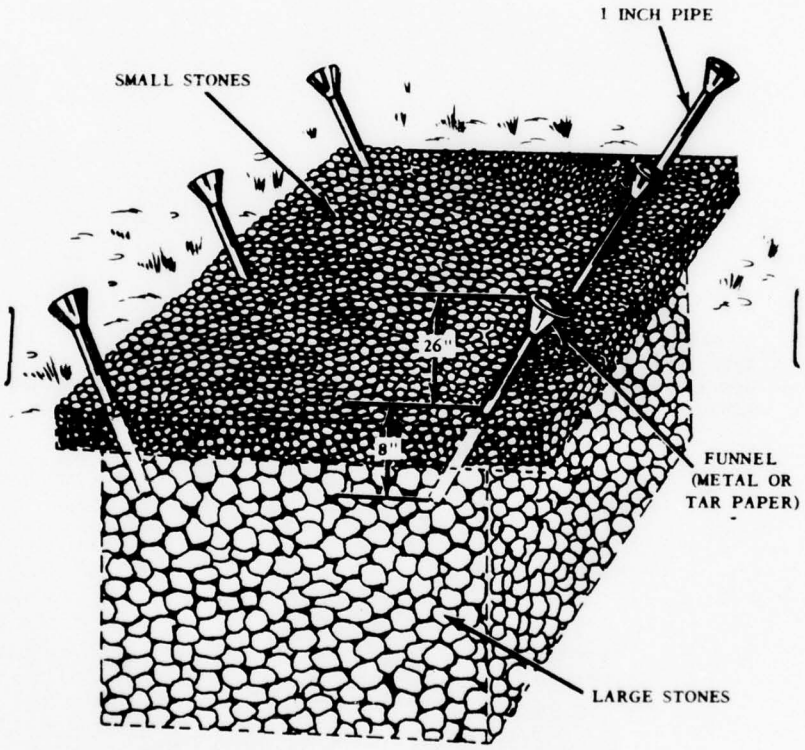
APPENDIX 12

TROUGH URINAL



APPENDIX 13

URINE SOAKAGE PIT

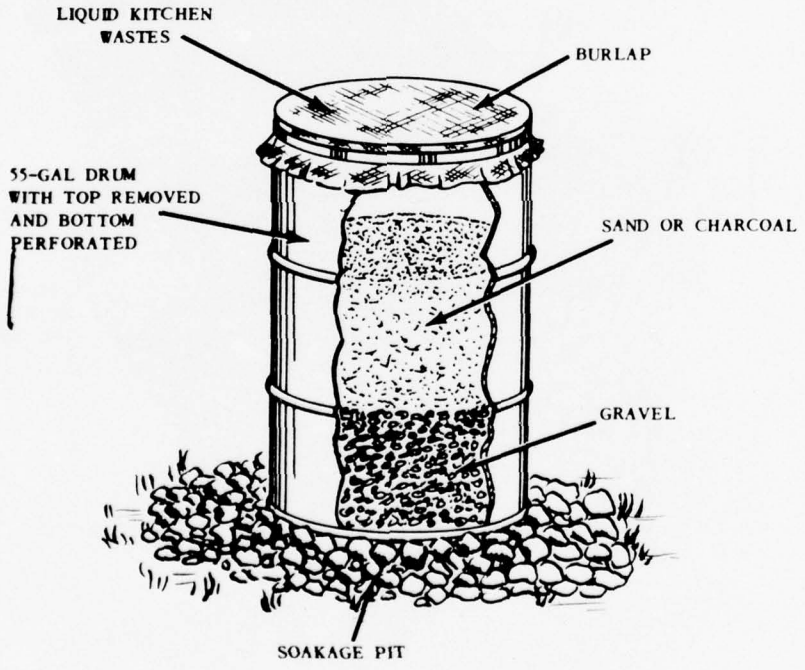


In areas where the water table is high the addition of oil to the soakage pit will eliminate bad odors by covering urine and water with an "odor proof" layer.

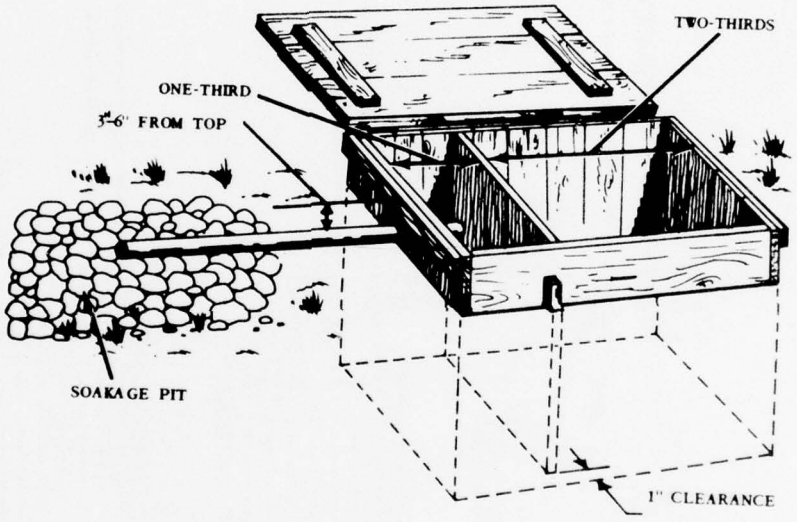
APPENDIX 14

GREASE TRAPS

I. FILTER GREASE TRAP.



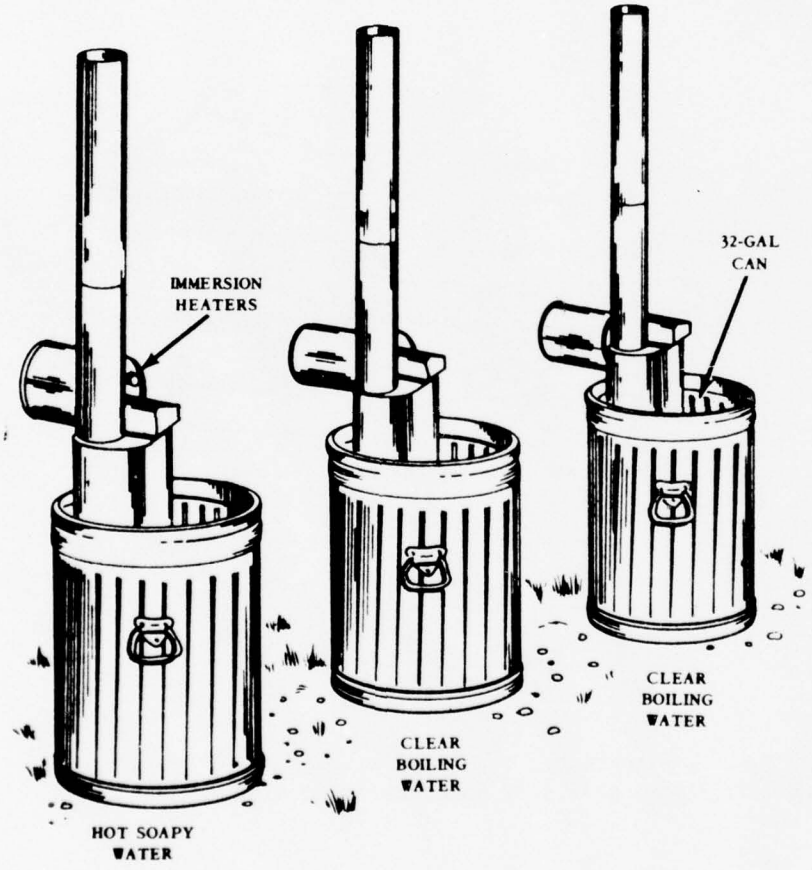
II. BAFFLE GREASE TRAP.



If the box is watertight, it may be placed on top of the ground; otherwise it must be placed partially under the ground.

APPENDIX 15

MESS KIT WASHING SETUP

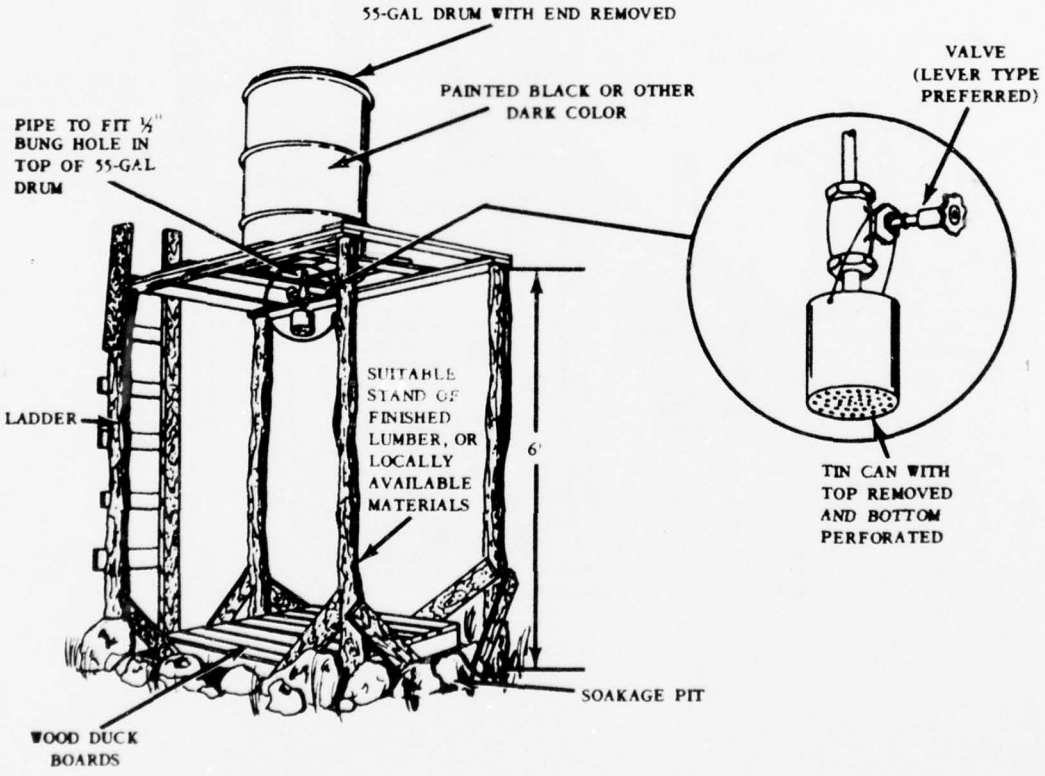


Immersion heater reduces 32-gallon can to 20-gallon capacity. One quart water required per mess kit. Fires may be used for heating water.

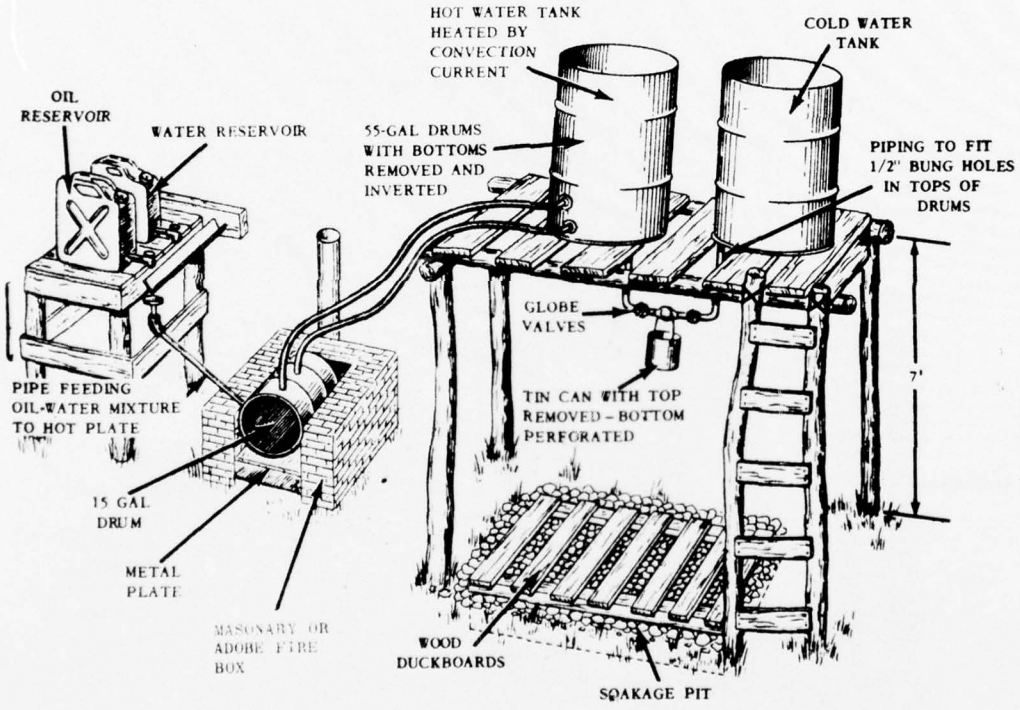
APPENDIX 16

SHOWERS

I. SHOWER-SOLAR HEATED.

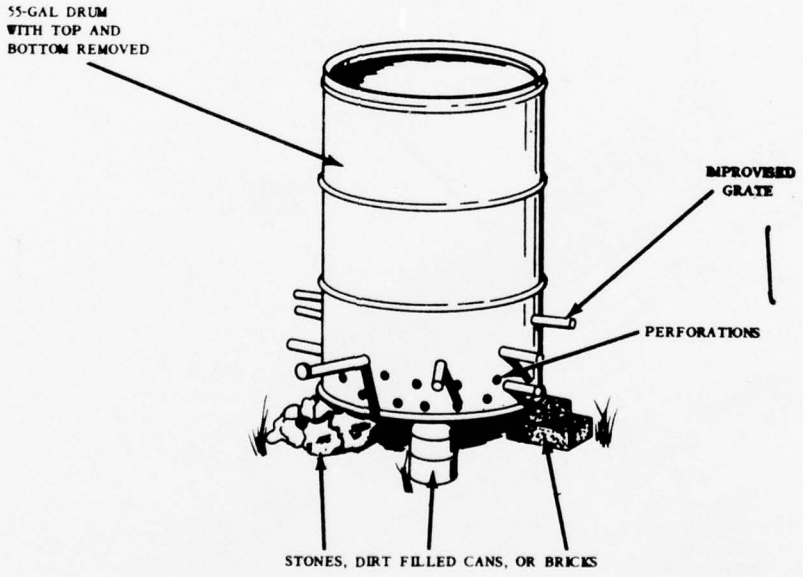


II. SHOWER UTILIZING OIL-WATER FLASH BURNER.



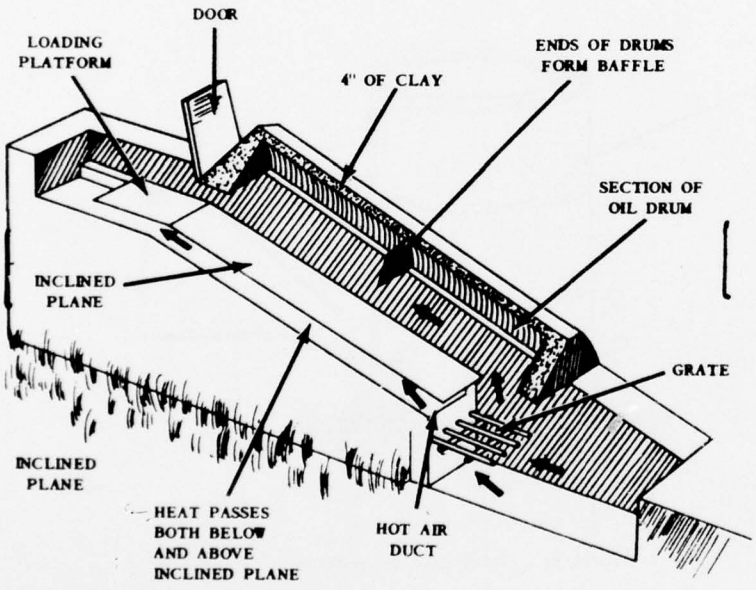
APPENDIX 17

BARREL INCINERATOR



APPENDIX 18

INCLINED PLANE INCINERATOR



APPENDIX 19

FIELD MESS INSPECTION CHECKLIST

I. POTABLE WATER (at least 5 ppm in most areas).

II. WORK TABLES, KNIVES, UTENSILS, POTS, PANS, CLEAN.

III. PROPER DRAINAGE AND POLICE.

IV. FOOD INSPECTION.

A. Meat, Fish, Poultry. If in doubt about the freshness, cook well done

B. Milk. Boil before use.

C. Vegetables. Wash off then disinfect with chlorine.

V. THREE WASHING CONTAINERS. One soapy, two boiling water. If not possible to have boiling water, one container soapy water, one clear rinse water, one with Disinfectant, Food Service, FSN 6840-270-8172 (one mess kit spoonful per 1/10 gallon water). Chlorox may also be used.

VI. PREDIP OF BOILING WATER SHOULD BE AVAILABLE.

VII. INSECT AND RODENT CONTROL.

VIII. WASTE DISPOSAL.

A. Soakage Pit With Grease Trap for Liquid Waste.

B. Deep Pit for Solid Waste, Fill to Within One Foot From the Surface, Then Cover.

IX. LATRINES.

A. Not Less than 90 Meters (if possible) From Mess.

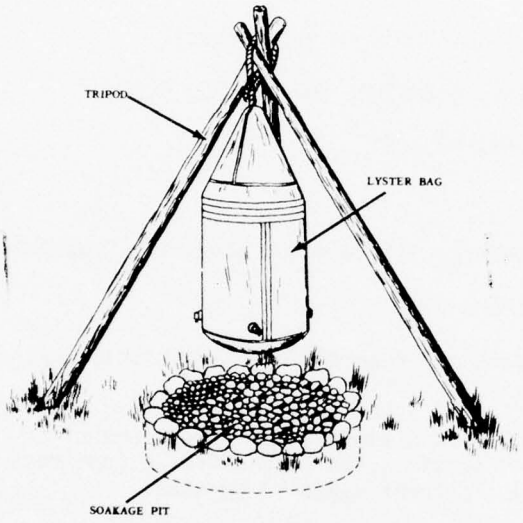
B. Latrines Not Below Water Table.

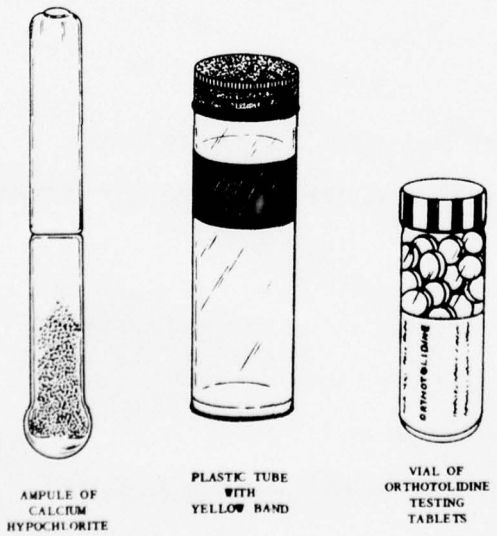
C. Does Not Drain Into Water Source.

D. Hand Washing Facilities Available and Used.

APPENDIX 20

LYSTER BAG AND CHLORINATION KIT





AMPULE OF CALCIUM HYPOCHLORITE

PLASTIC TUBE WITH YELLOW BAND

VIAL OF ORTHOTOLIDINE TESTING TABLETS

APPENDIX 21

LIST OF PESTICIDES, INSECT, AND RODENT CONTROL EQUIPMENT, AND WATER PURIFICATION SUPPLIES

1. Pesticides.

See SB 3–40 and AR 40–5 for new listings.

Federal Stock No.	Description	Unit
6840–753–4973	Rodenticide, Anticoagulant Bait, Ready-to-use	5 lb. can
6840–253–3892	Insecticide, DDT, Residual Type Spray (5-percent DDT).	5 gal. can
6840–844–7355	Insecticide, Diazinon (0.5-percent Diazinon).	1 gal. can
6840–823–7849	Insecticide, Pyrethrin Aerosol	12 oz. each
6840–242–4217	Insecticide, Lindane, Powder, Dusting (1-percent Lindane).	2 oz. can
6840–242–4219	Insecticide, Lindane, Powder, Dusting (1-percent Lindane).	25 lb. drum
6840–753–4963	Insect Repellent, Personal Application (75-percent Diethyltoluamide).	2 oz. Polyethylene bottle
6840–082–2541	Insect Repellent, Personal Application (75-percent Diethyltoluamide pressurized spray).	6 oz. pressurized dispenser can

2. Equipment.

See AR 40–5 and TA 20–2.

Federal Stock No.	Description	Unit
3740–132–5936	Duster, manually operated tubular pump (7⅝ in. long and 2¾ in. diameter), 1 discharge nozzle (type I, class B, size 2).	1
3740–691–1776	Sprayer, Insecticide, manually operated, 1-qt. capacity pump plunger.	1
3740–252–3383	Swatter, Fly, wire blade, felt binding, wire handle.	1
3740–252–3384	Trap, Mouse, spring, wood.	1
3740–260–1398	Trap, Rat, spring, wood base with 4-way release action.	1
3740–641–4719	Sprayer, Insecticide, hand, 2-gal. capacity.	1

3. Water Purification Supplies.

Federal Stock No.	Description	Unit
6850–270–6225	Chlorination Kit, Water Purification.	1
6850–250–2620	Tablet, Water Purification, 7.6 to 9.0 milligrams per tablet (iodine).	Bottle of 50 tablets

APPENDIX 22

IMMUNIZATION REQUIREMENTS (JULY 1968)

IMMUNIZING AGENT	BASIC SERIES	REIMMUNIZATION
Smallpox	Vaccination.	Vaccination yearly.
Typhoid-Paratyphoid	2 injections of 0.5cc 4 or more weeks apart.	0.5cc every 4 years.
Tetanua-Diphtheria	3 injections, 1st two 0.5cc, 2d given 1-2 months after 1st, 3d dose 0.1cc, 12 months after 2d dose.	0.1cc once every 6 years; 0.5cc after injury or burn.
Polio, Oral Trivalent	2 doses 8 weeks apart.	None.
Typhus	2 doses of 0.5cc 4 or more weeks apart.	0.5cc once yearly (1)
Yellow Fever (3)	One injection of 0.5cc.	0.5cc once every 10 years (2).
Influenza	One injection of 1.0cc.	Yearly as directed.
Cholera (3)	2 injections; 1st 0.5cc, 2d 1.0cc 4 or more weeks apart.	0.5cc every 6 months
Plague (3)	2 injections, 1st 1.0cc 2d 0.2cc 2-6 months later.	As directed.
Globulin, Immune Serum	5cc prior to departure to endemic area.	As directed.

(1) Personnel in a typhus area should receive typhus reimmunization just prior to local typhus season.

(2) Immunization or reimmunization must be accomplished not less than ten days and not more than six years prior to departure to a yellow fever area. Not less than 12 days prior to departure for India, Ceylon, and Pakistan.

(3) Travel will be delayed unless immunization and reimmunizations for yellow fever, cholera and plague are accomplished as stated.

APPENDIX 23

TREATMENT OF ANAPHYLAXIS

I. CONSTRICTING BAND. Place it proximal to site of injection if possible, not tight enough to stop arterial blood flow.

II. EPINEPHRINE. (1:1,000 aqueous solution) 0.5 ml IM or SQ, 0.5 ml around site of injection (if reaction due to an injection). Repeat 1 ml IM in 5-10 minutes and later prn.

III. IN SEVERE CASES. 0.2 ml of 1:1,000 epinephrine solution diluted to 10 ml and given IV slowly or directly into the heart with a long spinal needle.

IV. START IV. 1,000cc normal saline.

V. SOLUCORTEF. (Hydrocortisone sodium succinate) 100 mg given IV push.

VI. BENADRYL. (Diphenhydramine hydrochloride) 10 mg IV push, 100 mg placed in IV bottle.

VII. AMINOPHYLLINE. 250-500 mg given slowly IV over 10 minutes.

VIII. CHECK BLOOD PRESSURE. Every five minutes.

IX. ARAMINE. (Metaraminal bitartrate) 3 mg SQ or IM or 100 mg in 1,000 cc IV fluid. Add only if necessary.

X. NASAL OXYGEN.

XI. TRENDELENBURG POSITION.

XII. MAINTAIN AIRWAY. Tracheostomy if needed.

XIII. HOSPITALIZE THE PATIENT.

APPENDIX 24

COMPONENTS OF ANTI-ANAPHYLAXIS TRAY

I. SYRINGES. Dry, sterile syringes (10cc, 5cc, 2cc and 1cc) with suitable needles including needles suitable for intra-cardiac injection (long nr 21 or 22 Ga. spinal needles).

II. EPINEPHRINE. Solution, 1:1,000, 30cc vial, FSN 6505-117-5330. This should be inspected frequently for color changes and deterioration.

III. HYDROCORTISONE PHOSPHATE. Injection, 2cc vials, each cc containing 50 mg of hydrocortisones FSN 6505-753-9609.

IV. AMINOPHYLLINE. Injection, 0.25 GM, 10cc, IV, vial, FSN 6505-105-9500.

V. DYPHENHYDRAMINE HYDROCHLORIDE (BENADRYL). Injection, 10 mg, 10cc, NNR quality, for IV or IM use, FSN 6505-299-8611.

VI. TOURNIQUET. Nonpneumatic, FSN 6515-383-0550.

VII. AMOBARBITAL SODIUM. USP, sterile, 0.5 mg for injection, FSN 6505-141-3720.

VIII. METARAMINAL BITARTRATE. Injection, 10mg/cc (Aramine), 10cc vials, FSN 6505-763-9601.

IX. LEVARTERENOL BITARTRATE (LEVOPHED). 3 ampules, FSN 6505-299-9496.

X. AIRWAY. Pharyngeal, plastic, adult/child, FSN 6515-660-0046.

XI. OXYGEN. Suitable apparatus for administration.

XII. IV FLUIDS. Bottles of intravenous dextrose and physiological saline with sets of intravenous tubing and needles and tape.

APPENDIX 25

HISTORY AND PHYSICAL EXAMINATION GUIDE

I. OUTLINE OF MEDICAL HISTORY:

A. Identifying Data. Name, Rank, Service Number, Unit, Birthdate, Sex, Occupation, Race, Religion, and Marital Status.

B. Chief Complaint. Concise statement of primary reason the patient seeks help.

C. Present Illness. State of health prior to onset of illness, nature and circumstances of onset, location and nature of pain or discomfort, progression, treatment received, and its effect.

D. Past History. Childhood diseases, previous illnesses and injuries, previous hospitalization and surgery, and review of systems.

E. Family History. History of diabetes, hypertension, tuberculosis, etc.

F. Social History. Marital status, occupational data, and habits (tobacco, alcohol, drugs).

II. OUTLINE OF PHYSICAL EXAMINATION:

A. Vital Signs. Blood pressure, pulse, respiration, and temperature.

B. General. Posture, emotional state, state of consciousness, and acuteness or severity of illness.

C. Integument. Skin, hair, and nails.

D. Eyes. Lids, sclera, cornea, conjuctiva, pupil, lens, fundus, ocular motility, and visual acuity.

E. Ears. External ear, canals, tympanic membranes, and acuity.

F. Nose. External nose, septum, turbinates, and patency.

G. Mouth. Lips, teeth, gingivae, tongue, tonsils, throat, palate, and floor of mouth.

H. Neck. Trachea, thyroid, pulses, and lymph nodes.

I. Lungs. Chest shape, symmetry, expansion, percussion, and auscultation.

J. Heart. Pulse, BP color, peripheral perfusion, palpation, percussion, and auscultation.

K. Breasts. Symmetry, masses, and tenderness.

L. Abdomen. Inspection, palpation, percussion, auscultation for liver, spleen, kidneys, bladder, hernia, lymph nodes, masses, tenderness, muscle tone, and bowel sounds.

M. Genitalia. Penis and testes.

N. Rectum and Prostate.

O. Extremities. Strength, range of motion, and pulses.

P. Back. Curvature and mobility.

Q. Neurological. Cranial nerves, sensory system, motor system, reflexes, mental status, and meningeal signs.

APPENDIX 26

LABORATORY PROCEDURES

I. NORMAL VALUES RED BLOOD CELLS (MILLIONS/CU MM):

A. At Birth. 4.8 - 7.1

B. Childhood. 3.8 - 5.4

C. Adult Males. 4.6 - 6.2

D. Adult Females. 4.2 - 5.4

II. NORMAL VALUES DIFF. COUNT (PERCENT):

A. Neutrophilic Metamyelocytes. 0 - 1

B. Neutrophilic Bands. 3 - 5

C. Segmented Neutrophils. 55 - 65

D. Eosinophils. 2 - 4

E. Basophils. 0 - 1

F. Lymphocytes. 20 - 35

G. Monocytes. 2 - 6

III. NORMAL VALUES - WBC (THOUSANDS/CU MM):

A. Birth. 9 - 30

B. Childhood. 6 - 14

C. Adults. 5 - 10

IV. NORMAL VALUES FOR URINE:

A. Color. Straw, yellow, amber.

B. Appearance. Clear, hazy, cloudy.

C. Reaction (PH).

D. Specific Gravity. 1.003 - 1.030 (for 24 hour specimen, specific). Gravity will range 1.015 - 1.025. If there is a delay in analysis, add four drops of formalin to 100cc of urine to preserve specimen. However, do not use formalin if sugar concentration is to be determined. To obtain specific gravity when an insufficient amount of urine is present to float the weighted meter:

1. Dilute with distilled water and measure specific gravity of dilute mixture.

2. Multiply the numbers after decimal point by total volume of urine and water.

3. Divide by volume of urine diluted.

4. Add one.

Example: 20cc of urine are diluted with 30cc of distilled water. The specific gravity of this diluted mixture is 1.006, therefore the undiluted urine is $\frac{.006 \times 50}{20} + 1 = 1.015$.

V. STAINING TECHNIQUES:

A. Gram Stain:

1. Dry thoroughly.

2. Heat fix.

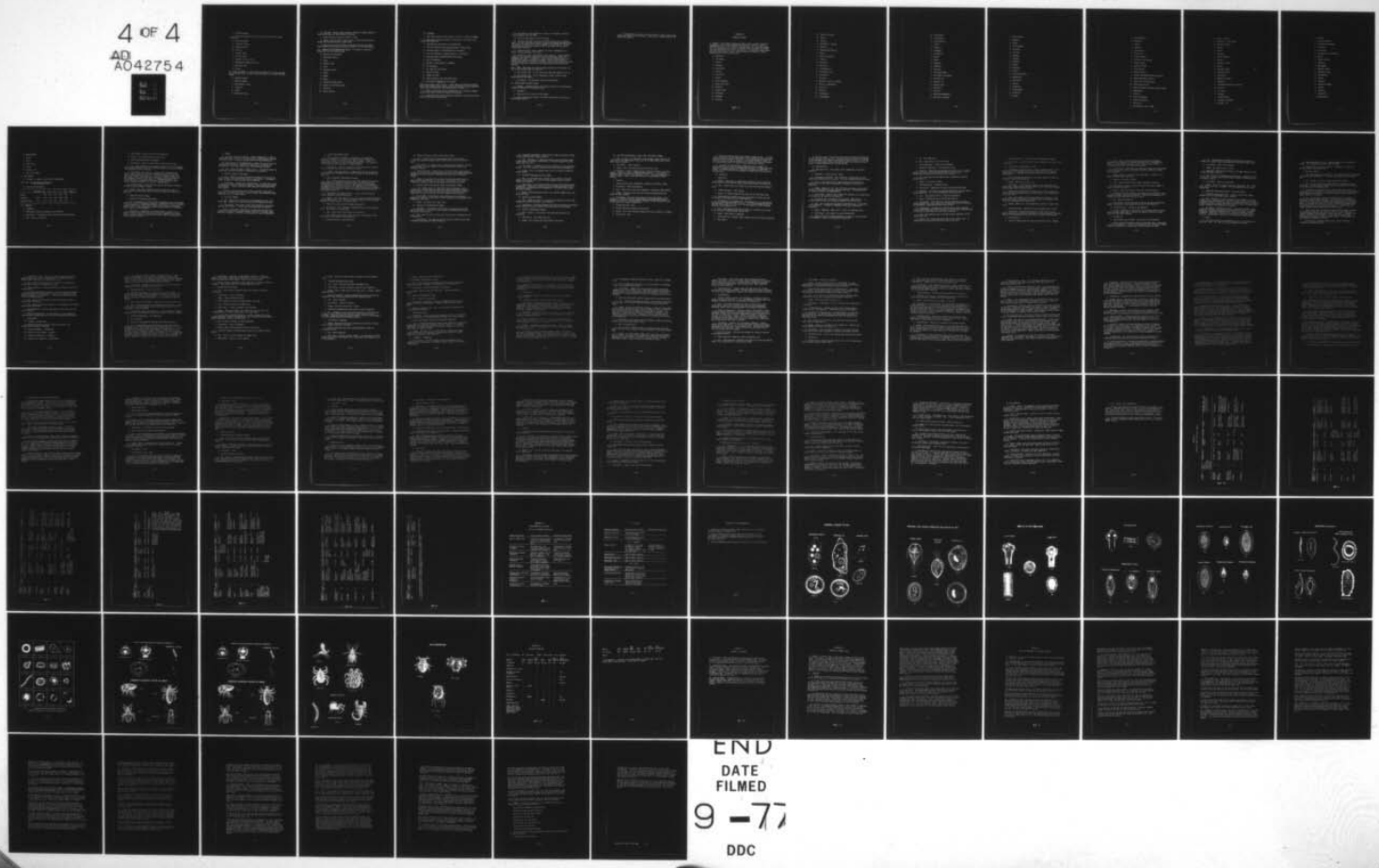
3. Crystal violet (60 sec).

4. Wash with water.

5. Gram's iodine (60 sec).

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6. Wash with water.

7. Spray with decolorizer (5-10 sex) until blue color in runoff disappears.

8. Wash with water.

9. Safranin (30 sec).

10. Wash with water.

11. Air dry.

B. Wright's Stain:

1. Air dry slide.

2. Wright's stain (1-2 min).

3. Add D/water (buffer) (2-4 min).

4. Wash with water.

5. Air dry.

VI. DIRECT WET SMEAR. In the microscopic examination of fecal specimens for ova and parasites, the most simplified method is the direct wet smear method.

A. Materials Needed:

1. Medicine dropper.

2. Physiological saline.

3. Coverslips.

4. Slides.

5. Applicator sticks.

B. Technique. Adding a drop of Lugol's solution to a small portion of feces may be used as a rapid screening technique.

1. Place one drop of saline in center of slide.

2. Select a small portion of feces and mix on slide with one drop of saline that has been previously placed there.

3. Add cover slip to the mixture and examine first using low power, then switching to high power for better observation of suspicious objects.

VII. FORMALIN ETHER SEDIMENTATIONS METHOD. This method is excellent in recovery of cysts and helminth eggs.

A. Materials and Equipment:

1. Physiologic saline.

2. Gauze.

3. Formalin (10%).

4. Ether.

5. Applicator sticks.

6. Slides.

7. Beaker.

8. Funnel.

9. Pointed centrifuge tubes.

10. Stopper for centrifuge tubes.

11. Coverslips.

12. Iodine solution.

B. Technique:

1. Take small portion of feces and mix in 10-12cc of saline in beaker.

2. Pass mixture through two layers of wet gauze, using funnel, into pointed centrifuge tube.

3. Centrifuge for two minutes at 1500-2000 RPM.

4. Pour off supernate and resuspend sediment in fresh saline.

5. Centrifuge again at 1500-2000 RPM for two minutes.

6. Pour off supernate, resuspend sediment in fresh saline.

7. Centrifuge again 1500-2000 RPM for two minutes.

8. Pour off supernate.

9. Add 10cc of 10% formalin to sediment.

10. Mix thoroughly.

11. Let stand for five minutes.

12. Add 3cc of ether.

13. Stopper the tube.

14. Shake vigorously until thoroughly mixed.

15. Centrifuge at 1500 RPM for two minutes.

(Four layers should result in tube: a small amount of sediment containing most of the protozoan cysts and ova, a layer of formalin, a plug of detritus just on top of the formalin, and a topmost layer of ether.)

16. Remove floating debris with an applicator stick and quickly decant the top three layers leaving the sediment undisturbed.

17. Using applicator stick mix remaining sediment in the tube with fluid that will drain back from the sides.

18. Place drop on slide, add drop of iodine, mix thoroughly, add cover slip and examine using low power.

19. Switch to high power to confirm findings.

20. All fecal specimens should be put in MIF solution prior to examinations. This will save space, cut down on stench and preserve specimen (walnut size portion of specimen is all that is needed for lab findings). Portions of specimen plus three times portion of MIF is the proper way to store or send specimen from field.

21. Formula for MIF. Lugol's solution, 10 parts; formaldehyde, 12.5 parts; tincture methiolate, 77.5 parts.

22. Formula for Lugol's Concentrated "Stock Solution". Iodine (powdered crystals) 5 gm, Potassium Iodide (KI) 10 gm, distilled water 100cc, mix thoroughly and filter. If placed in a light resistant (brown) bottle, this solution will remain satisfactory for months. Prior to using dilute by mixing, one part Lugol's to four or five parts water to make "working solution". This dilute solution is unstable and should be mixed fresh at least every ten days.

VIII. TUBES. Vacutainers are used if sending specimens to the hospital lab and if the following tubes are available:

A. Gray Stopper Tube. Use for blood sugar, BUN, NPN, ammonia, and iron.

B. Blue Stopper Tube. Use for hematology, alcohol, carbon dioxide, carbon monoxide, and oxygen.

C. Red Stopper. All procedures requiring clotted blood.

IX. STOOL GUAIAC FOR OCCULT BLOOD:

A. Reagents. Hydrogen peroxide (3%), glacial acetic acid, and saturated solution of Gum Guaiac in 95% ethyl alcohol.

B. Procedure:

1. Smear small bit of feces on filter paper.

2. Add one drop Guaiac solution, one drop Glacial acetic acid, and one drop hydrogen peroxide.

3. Interpretation of results. Positive reaction is when a blue or dark green color appears within 30 seconds. Other color or delayed reaction are regarded as negative.

APPENDIX 27

THERAPEUTIC AGENTS

I. GENERAL. The following Formulary of drugs listed in general categories dependent upon their primary pharmacological effect. They are listed in alphabetical order in each category. The name used first is the most common one in current general use and is followed by either the generic or proprietary name (marked with an R) which ever applies. Only the most common effects and uses of each drug is listed. For more complete information, a recent pharmacology text should be consulted.

A. Analgesics:

1. APC tablets.

2. Aspirin.

3. Auralgan.

4. Butazolidin.

5. Codeine.

6. Colchicine.

7. Darvon.

8. Darvon compound.

9. Methyl salicylate.

10. Morphine.

11. Parafon forte.

12. Phenacetin.

13. Phenaphen.

14. Pyridium.

15. Sodium salicylate.

16. Tylenol.

17. Zactirin.

B. Anesthetics. Eugenol.

C. Antacids:

1. Aluminum hydroxide gel.

2. Maalox.

3. Sodium bicarbonate.

4. Titralac.

D. Antibiotics:

1. Bacitracin.

2. Chloramphenicol.

3. Cortisporin otic.

4. Erythromycin.

5. Isoniazid.

6. Neosporin (topical ointment).

7. Neosporin (ophthalmic).

8. Penicillin.

9. Polymyxin.

10. Streptomycin.

11. Sulfacetamide.

12. Sulfonamides.

13. Tetracyclene.

E. Antidiarrheals:

1. Lomotil.

2. Paregoric.

3. Polymagma.

F. Antiemetics:

1. Bonine.

2. Combid.

3. Compazine.

4. Dramamine.

5. Thorazine.

G. Antifungal Agents:

1. Foot powder, antifungal.

2. Griseofulvin.

3. Lidaform - HC.

4. Mycolog cream.

5. Mycostatin.

6. Tinactin.

7. Potassium permanganate.

8. Whitfield's ointment.

H. Antihistamines:

1. Benadryl.
2. Bonine.
3. Chlor-trimeton.
4. Co-pyronil.
5. Coricidin.
6. Dimetane.
7. Dimetapp.
8. Dramamine.
9. Ornade.
10. Phenergan.
11. Temaril.

I. Antimalarial Drugs:

1. Amodiaquine.
2. Chloroquine.
3. Dapsone.
4. Primaquine.
5. Pyrimethamine.
6. Quinacrine.
7. Quinine.

J. Antispasmodics:

1. Atropine.

2. Combid.

3. Donnatal.

4. Pro-banthine.

K. Biologicals:

1. Cholera vaccine.

2. Influenza virus vaccine.

3. Plague vaccine.

4. Tuberculin (PPD).

5. Polio vaccine.

6. Smallpox vaccine.

7. Tetanus and tetanus-diphtheria vaccine.

8. Typhoid-paratyphoid vaccine.

9. Typhus vaccine (louse-borne).

10. Yellow fever vaccine.

L. Drugs Affecting the Central Nervous System:

1. Amphetamines.

2. Dilantin.

M. Cough Preparations:

1. Benylin expectorant.

2. Robitussin.

3. Terpinhydrate, elixir (ETH).

N. Emetics. Ipecac.

O. Hematinics. Iron sulfate.

P. Hemostatic Agents:

1. Gelfoam.

2. Oxycel.

Q. Laxatives:

1. Cascara sagrada.

2. Ducolax.

3. Magnesium sulfate.

4. Senokot.

R. Ophthalmic Drugs:

1. Fluorescein dye.

2. Homatropine.

3. Neosporin ointment.

4. Ophthaine.

5. Sulfacetamide drops and ointment.

6. Tearisol.

S. Otic Drugs:

1. Auralgan.

2. Cerumenex drops.

3. Cortisporin ointment.

4. Lidaform - HC.

T. Steroids:

1. Cortisone acetate.

2. Hydrocortisone acetate.

3. Prednisone.

4. Solu-cortef.

U. Tranquilizers and Sedatives:

1. Amytal.

2. Chloral hydrate.

3. Compazine.

4. Meprobamate.

5. Nembutal sodium.

6. Pentothal sodium.

7. Phenobarbital.

8. Seconal.

9. Thorazine.

V. Vasopressor Agents:

1. Aramine.

2. Ephedrine.

3. Epinephrine.

4. Neosynephrine.

W. Miscellaneous:

1. Anusol.

2. Eurax.

3. Kwell cream.

4. Tedral.

5. Wyanoids - HC.

6. Zinc oxide powder.

II. DRUG DOSAGES.

A. Children. In general, Young's Rule is applicable:

$$\text{Childs dose} = \frac{\text{Age (in years)} \times \text{Adult dose}}{\text{Age (in years)} + 12}$$

B. Fraction of Adult Doses.

	New-Born	6 mo	1 yr	2 yr	5 yr	10 yr	Adult
By Age		0.04	0.08	0.15	0.29	0.45	1
By Weight	0.05	0.11	0.14	0.18	0.26	0.45	1
By,Surface Area	0.12	0.21	0.26	0.31	0.42	0.64	1

III. FORMULARY.

A. Analgesics:

1. APC^R tablets (Aspirin, phenacetin, and caffeine):

a. Description. A combination tablet used for mild pain and fever.

b. Uses. Same as for aspirin.

c. Side effects. Same as for aspirin and phenacetin.

d. Dosage. One or two tablets every four hours.

2. Aspirin (Acetylsalicylic Acid 324mg):

a. Description. Aspirin is used mainly for mild pain and fever.

b. Uses. Used for the relief of certain types of pain such as headache and that associated with minor musculoskeletal injuries. Also used to lower high temperature and for arthritis.

c. Side effects. ASA toxicity - ringing in ears followed by more severe symptoms (headache, confusions, drowsiness, nausea and vomiting, fever, hallucinations, and delerium). As few as 30 aspirin tablets have been fatal in adults when taken as a single dose. Allergic reactions are not infrequent and may be very severe. GI bleeding and gastritis are significant only in susceptible individuals (persons with peptic ulcer disease, bleeding disorders, and persons on anticoagulents).

d. Contraindications. Allergy to ASA, peptic ulcer disease, bleeding disorders, and anticoagulent therapy.

e. Dosage. Usual dose is 600mg (two tablets) every four hours for adults and for children, 64mg every four hours for each year of age up to ten years.

3. Auralgan^{R} (See Otic Drugs).

4. Butazolidin^{R} (Phenylbutazone 100mg):

a. Uses. Butazolidin is an orally effective compound possessing antipain, anti-fever, and anti-inflammatory properties. Butazolidin cannot be considered a simple analgesic and should never be administered casually. Butazolidin affords relief for gout, rheumatoid arthritis, acute superficial thrombophlebitis, bursitis, and tenosynovitis.

b. Side effects. Butazolidin is contraindicated in patients with a history of peptic ulcer, blood disorders, allergy to Butazolidin, or renal, cardiac, or hepatic damage. Adverse reactions most commonly encountered are nausea, edema, and drug rash.

c. Dosage:

(1) Arthritis and painful shoulder - 300mg to 600mg daily in three or four divided doses initially, then decreased to the minimum level necessary to maintain relief. Maintenance dosage should not exceed 400mg daily.

(2) Acute superficial thrombophlebitis - 600mg daily for the first two or three days followed by a reduction to 300mg daily. Treatment with Butazolidin for any reason should not be continued beyond one week.

(3) Gout - 400mg, followed by 200mg q 4 to 6 h. Butazolidin should be reserved for patients intolerant or unresponsive to colchicine.

5. Codeine (Codeine sulfate 32mg):

a. Uses. Codeine, a narcotic derivative of morphine, is used for the relief of pain, as an antidiarrheal, and as an antitussive. The analgesic action of codeine is about one-sixth that of morphine.

b. Side effects. Codeine may be habit-forming. It should not be given to persons with history of allergy to codeine. It also causes constipation and drowsiness. Patients needing to remain awake and alert should not be given codeine.

c. Dosage. Usual analgesic dose is 32mg (1/2 grain) every three to four hours. The antitussive dose is from 5 to 10mg. Most frequently comes mixed with Elixor of Turpin-hydrate.

6. Colchicine (500mg):

a. Uses. Colchicine is used only for the management of gout in the acute stage. Response to colchicine establishes the diagnosis of gout.

b. Side effects. Toxic signs include severe abdominal pain, nausea, vomiting, and diarrhea. If these occur the dosage should be reduced.

c. Dosage. Usual dose of Colchicine is 0.5mg every hour until pain disappears or until toxic symptoms (nausea, vomiting, or diarrhea) ensue. After pain disappears, Colchicine is discontinued in favor of Butazolidin.

7. Darvon^{R} (Propoxyphene 32mg):

a. Uses. Darvon is a synthetic, non-narcotic, non-salicylate analgesic indicated for the reduction or amelioration of moderate pain. Darvon 65mg is about the same as codeine 32mg in potency. Alone, it possesses no anti-fever or anti-inflammatory properties. It is useful in the treatment of pain when aspirin is contraindicated.

b. Side effects. There are no definite contraindications or significant side effects other than an occasional GI upset.

c. Dosage. Usual adult dosage is 32-65mg every four to six hours prn. Large doses (above 600-800mg per day) usually produce cns and respiratory depression.

8. Darvon Compound^{R} (Propoxyphene Compound):

a. Uses. Darvon compound is Darvon 32 or 64mg, combined with aspirin, 227mg; phenacetin, 162mg; and caffeine, 32.4mg. Darvon provides anti-inflammatory and antipyretic (anti-fever) activity as well as analgesia. This combination is especially useful in the symptomatic relief of various inflammatory states such as arthritis and in those situations in which Darvon alone seems to be ineffective. (Darvon is frequently more effective when combined with aspirin.)

b. Side effects and contraindications. Same as those for Darvon, aspirin, phenacetin, and caffeine alone.

c. Dosage. Usual adult dosage is one or two capsules q3-4h (each capsule contains 32mg Darvon). Also available as Darvon Compound 65 which contains 65mg Darvon and the dosage is one capsule q3-4h.

9. Methyl Salicylate (Banalg^{R} Liniment, Panalgesic^{R}):

a. Description. This is a useful liniment which may be used topically only. Also called oil of wintergreen.

b. Dose. Apply two or three times daily as required.

c. Use. Myalgia, minor muscle aches and pains, and temporary relief from minor pains or arthritis and rheumatism.

d. Contraindications. Hypersensitivity.

10. Morphine (Morphine sulfate) 16mg Syretts, 5/pkg:

a. Uses. A potent narcotic used therapeutically to relieve pain. In addition, morphine possesses sedative action which aids in the relief of pain.

b. Side effects. In moderate doses, morphine produces euphoria, inability to concentrate, lethargy, dimness of vision, depressed respirations, and sometimes vomiting.

c. Contraindications. Asthma attacks, convulsive states, head injuries, and any case in which the respiratory capacity is seriously hampered (emphysema, pneumonia, and severe obesity), undiagnosed abdominal pains, and walking wounded.

d. Dosage. Average dose for the relief of acute pain varies from 8 to 20mg, usually 10mg (1/6 grain) for an adult. Doses above 1/4 gr do not increase the analgesic effect but may lengthen the duration of effect.

11. Parafon Forte^{R} (Chloroxazone, 250mg; acetaminophen, 300mg):

a. Uses. Parafon forte is a combination tablet containing a muscle relaxant, Chloroxazone (Paraflex) and a non-salicylate analgesic, acetaminophen (Tylenol). It provides some relief of painful skeletal muscle spasm associated with sprains, strains, and other traumatic muscle injuries.

b. Side effects. Parafon forte is well tolerated, but occasionally produces the undesirable side effect of mental confusion which disappears after withdrawal of the drug.

c. Dosage. Two tablets four times a day.

12. Phenacetin^{R} (Acetophenetidin 324mg):

a. Description. An analgesic and antipyretic drug whose uses are the same as salicylates. The drug is usually given in combination with aspirin and caffeine (APC tablets).

b. Uses. Used for relief of minor types of pain such as headache and for reducing fever.

c. Side effects. Continuous use for long periods of time has been shown to produce kidney damage in some individuals.

13. Penaphen^{R} (Phenobarbital, 15mg; aspirin, 150mg; hyoscyamine sulfate, 0.031mg; and phenacetin, 180mg, capsules):

a. Uses. Phenaphen is a combination capsule used for analgesia when a small amount of sedation is desirable as in tension headache and various muscle aches and pains.

b. Side effects. Phenaphen may be habit forming due to its barbiturate content. For other specific side effects see aspirin and acetophenetidin.

c. Dosage. One or two capsules every four to six hours as needed for relief of pain.

14. Pyridium^{R} (Phenazopyridine HCL 100mg):

a. Uses. An oral medication, pyridium acts to produce an analgesic effect on the urinary tract, which relieves symptoms of pain, burning, urgency, and frequency.

b. Side effects. An occasional patient may experience gastrointestinal disturbances. Pyridium will cause the urine to become orange-red in color and this must be differentiated from hematuria. The patient should always be warned in advance.

c. Dosage. The average adult dosage is two tablets (200mg) three times daily after meals.

15. Sodium salicylate (324mg):

a. Uses. Sodium salicylate is an analgesic and antipyretic used in the treatment of arthritis and muscle and joint pain.

b. Side effects. Overdosage produces salicylism characterized by anorexia, nausea, vomiting, headache, tinnitus, dizziness, thirst, and lassitude.

16. Tylenol^{R} (Acetaminophen 325mg):

a. Uses. Tylenol is a non-aspirin, non-salicylate analgesic and antipyretic.

b. Side effects. Side effects are rare.

c. Dosage. One or two tablets every three to four hours.

17. Zactirin^{R} (Ethoheptozine citrate, 75mg, and Aspirin, 325mg):

a. Uses. Zactirin is a combination of two analgesic drugs indicated for the relief of all common types of pain, but not in those severe types of pain which require narcotics.

b. Side effects. Same as aspirin.

c. Dosage. One or two tablets three or four times a day.

B. Anesthetics (local). Eugenol (extract from Oil of Cloves), one ounce bottles. Eugenol is a topical anesthetic and antiseptic. It is used for emergency dental conditions for symptomatic relief. Zinc oxide powder may be added to eugenol to make a paste which serves as a good temporary dental filling.

C. Antacids:

1. Aluminum Hydroxide Gel (Amphogel^{R}), suspension and tablets, 300mg:

a. Description. Milky white antacid.

b. Uses. Peptic ulcer, gastritis, esophagitis, and gastric hyper-acidity.

c. Dosage. 10-30cc at one to four hour intervals depending upon the condition under treatment.

d. Side effects. May lead to constipation in some individuals. If so, switch to an antacid containing aluminum hydroxide and magnesium (Maalox^{R}, Aludrox^{R}, or Gelusil^{R}). Gastrointestinal absorption of the tetracycline drugs is inhibited by all antacid preparations.

e. Contraindications. None.

2. Maalox^{R} (Magnesium aluminum hydroxide gel):

a. Dosage. Two to four teaspoons between meals and at bedtime or as needed.

b. Side effects. None.

3. Sodium bicarbonate (baking soda, powder or 600mg tablets). A systemic antacid used orally to treat hyperacidity of the stomach and also used intravenously to treat acidosis of the blood. For antacid dosage give 2gm up to four times daily P.O. and for acidosis give one ampule IV every five minutes for cardiac arrest, much less often for most other acidotic states.

4. Titralac^{R} (calcium carbonate, 9.42gm and glycine, 0.18gm). An antacid which contains calcium carbonate and glycine for its buffering effect, titralac is pleasant tasting and is available in tablet and liquid form. Dosage. One to two tablets or one teaspoon as needed every one to two hours for ulcer pain.

D. Antibiotics:

1. Bacitracin:

a. General. Bacitracin is a good topical antibiotic with a relatively good spectrum of action against gram positive bacteria, much like penicillin.

b. Uses. Topical use on pus forming skin infections especially Staphylococci.

c. Contraindications. Prior allergy.

d. Dosage. It should be applied sparingly, one to three times a day.

e. Side effects and untoward reactions are primarily allergic ones and are relatively rare when the drug is used topically.

2. Chloramphenicol (Chloromycetin^{R}). Chloramphenicol is a broad spectrum antibiotic and is bacterio-static in action. It is well absorbed from the GI tract and may be given P.O., IM, or IV. The drug appears to inhibit protein synthesis in the bacterial cell.

a. Uses. Gram negative, gram positive bacteria, rickettsia, and viruses of the psittacosis-lymphogranuloma venerum group.

b. Dosage. Usual dosage is 250mg q6h.

c. Contraindications. Anemia, hepatic disease, and prior allergic reactions.

d. Side effects:

(1) Aplastic anemia. All patients should receive a WBC and differential no less often than every two days. Therapy should be discontinued if the WBC falls below 4000 or the number of granulocytes (bands and polys) is below 40%. If this is done, complete bone marrow depression will not occur and it will regain its blood forming ability in about one week.

(2) Superinfection.

(3) Hypersensitivity. Skin rashes, fever, hemorrhage, and atrophic glossitis.

3. Cortisporin - Otic^{R} (See Otic drugs).

4. Erythromycin (Ilosone^{R}). This antibiotic is bactericidal to some organisms and bacteriostatic to others. It is well absorbed from the GI tract.

a. Uses. It has essentially the same spectrum of sensitivities as penicillin and is the drug of choice when an individual is allergic to penicillin.

b. Dosage. 250mg q.i.d. PO. The IM injection of 100mg is very painful and can be tolerated only by an exceptional individual. IV administration is followed uniformly by thrombophlebitis.

c. Side effects. They are few in number and incidence, but include fever, skin eruptions, eosinophilia, and hepatitis.

5. Isoniazid^{R} (INH, isonicotinic acid hydrazide, 100mg tablets). It is administered orally and is completely absorbed from the GI tract.

a. Uses. INH is effective only against mycobacteria and is used widely in TB prophylaxis. Treatment is 300mg/day for one year following PPD conversion.

b. Dosage. 300mg/day. (May be given singly or in divided doses.)

c. Side effects. Skin rashes, GI upset, and neuralgia.

6. Neosporin^{R} topical ointment (Polymyxin B, neomycin, and bacitracin). This ointment is similar to the ophthalmic preparation.

a. Use. Skin infections.

b. Dose. Apply three or four times daily.

c. Contraindications. Allergy to any component.

7. Neosporin^{R} *(ophthalmic)*. *See Ophthalmic Drugs.*

8. Penicillin. Penicillin may be given orally, IM, or IV. If given orally it achieves maximum blood concentration in 30-60 minutes. It is bactericidal and acts by inhibiting cell wall synthesis.

a. Uses. Gram positive and negative cocci, spirochetes, and gram *positive baccili.*

b. Dosage. See specific disease.

c. Contraindications. Hypersensitivity.

d. Side effects. Anaphylaxis and other allergic manifestations.

9. Polymyxin. This drug is not absorbed from the GI tract and must be given parenterally. It is also an important topical antibiotic.

a. Uses. Gram negative bacilli, especially pseudomonas.

b. Doses. 2.5mg/kg per day in four divided doses IM.

c. Side effects. Skin eruptions, transient neuralgias, dizziness, speech abnormalities, fever, apnea, loss of coordination, partial deafness, GI disturbances, superinfection, and kidney failure.

10. Streptomycin. Streptomycin is bactericidal and poorly absorbed from the gastrointestinal tract; therefore, the prime route of administration is IM unless a local effect in the GI tract is desired.

a. Uses. Gram negative rods, a few gram positive organisms, and the tubercle bacillus.

b. Dosage. One to two gm per day in two to four divided doses. In tuberculosis only the entire dose may be given at one time.

c. Contraindications. Hypersensitivity and internal ear damage.

d. Side effects. Anaphylaxis, skin rashes, stomatitis, and pain at site of injection.

11. Sulfacetamide (see Ophthalmic Drugs).

12. Sulfonamides (Gantrisin^{R}, etc.). They are bacteriostatic in their action and are well absorbed from the gastrointestinal tract. Topical administration is condemned because of the resultant high incidence of sensitization.

a. Uses. Meningococcal meningitis, baccillary dysentary, chancroid, and acute urinary tract infections.

b. Dosage. 4gm STAT, then 1gm q.i.d.

c. Side effects. Acute hemolytic anemia, crystal deposits in the urinary tract (good hydration protects against this), kidney tubule damage, serum sickness, fever, and skin rashes.

13. Tetracycline (tetracycline, oxytetracycline, chlor tetracycline). The tetracyclines are bacteriostatic in their action. They are effective orally, IM, and IV.

a. Uses. Gram negative rods and many gram-positive bacteria. They are also effective in treatment of rickettsial and viral diseases of the psittacosis-lymphogranuloma venereum group.

b. Dosage. 250mg q.i.d. This dosage may be doubled in severe infections.

c. Contraindications. Hypersensitivity and advanced renal failure.

d. Side effects. Anaphylaxis, glossitis, rectal itching, fever, nausea, vomiting, diarrhea, and thrombophlebitis (with intravenous infusions). The use of out-dated tetracyclines can lead to a diabetes-like syndrome.

E. Antidiarrheals:

1. Lomotil^{R} (Diphenoxylate HC 2.5mg, with atropine sulfate, 0.025mg):

a. Uses. Lomotil inhibits excessive gastrointestinal propulsion. Indicated in the treatment of diarrhea associated with: gastroenteritis, drugs, acute infections, ulcerative colitis, food poisoning, and the laxative action of water with high mineral content.

b. Side effects. Side effects are relatively uncommon, but occasionally individuals experience nausea, drowsiness, dizziness, vomiting, itching, or skin eruptions.

c. Dosage. Adults: two tablets four times daily. Children: 8-12 years, one tablet four times daily.

2. Paregoric (tincture of opium):

a. Uses. Helps provide relief of common non-specific diarrhea.

b. Side effects. Excessive doses may produce side effects common to morphine and can be addicting.

c. Dosage. One to two teaspoons four times daily for adults.

3. Polymagma^{R} (Dihidrostreptomycin and Polymyxin with Claysorb^{R}, pectin, and alumina powder, suspension and tablets). Both Dihydrostreptomycin and Polymyxin are poorly absorbed from the GI tract.

a. Use. Bacillary dysentery.

b. Side effects. Use for more than a few days may cause permanent ear damage or overgrowth of non-susceptible bacteria in the intestine.

c. Contraindications. Allergy to any component.

d. Dosage. Suspension (8 ounce bottle) four teaspoons (20cc) three to four times daily before meals. Tablets, two tablets initially, then two after each loose bowel movement.

F. Antiemetics:

1. Bonine^{R} (Meclizine HC 25mg). See section on antihistamines.

2. Combid spansules^{R} (Compazine, 10mg; isopropamide, 5mg). Isopropamide is a good antispasmodic to counter gastrointestinal spasm; therefore, combid rather than compazine is indicated when treating nausea with spasm.

a. Uses. Gastrointestinal conditions associated with nausea and cramping; i.e., peptic ulcer, gastroenteritis, and genito urinary spasm.

b. Side effects. Same as for Thorazine.

c. Dosage. One capsule every 12 hours.

3. Compazine^{R} (Prochlorperazine tablets, 5,10,25mg; Spansules, 10,15, 30,75mg, and Ampuls, 5mg/cc).

a. Uses. Same as for Chlorpromazine (Thorazine). Compazine is used primarily for its anti-nausea effects whereas Thorazine is used mainly for its sedative effects.

b. Side effects. Same as for Thorazine.

c. Dosage. Oral: 5 or 10mg three or four times daily. IM: 5-10mg every three or four hours as needed. Total IM dosage should not exceed 40mg per day.

4. Dramamine^{R} (Dimenhydimate 50mg). See Antihistamines.

5. Thorazine^{R} (Chlorpromazine HCL: tablets, 10,25,50,100, 200mg; Spansules, 30,75,150,200,300mg; Ampuls, 25mg/cc).

a. Uses. Thorazine is a major tranquilizer and a member of the class of drugs known as phenothiazines. Thorazine is used primarily for control of anxiety, tension, and confusion seen in psychiatric conditions; to control restlessness, anxiety, nausea, and vomiting; and to reduce, by potentiation, narcotic, sedative, and anesthetic requirements.

b. Side effects. Drowsiness may occur. Occasional dry mouth, nasal congestion, constipation, pupillary constriction, and increase in appetite and weight. Jaundice and agranulocytosis have been reported. Postural hypotension, tachycardia, fainting, and dizziness may occur when given by injection. Dermatological reactions of a mild type are sometimes seen.

c. Dosage:

(1) For tension, anxiety, or apprehension - orally: 10mg-25mg two or three times a day. IM: 25mg (1cc) may be repeated in one hour.

(2) Nausea and vomiting - oral: 10mg-25mg every four to six hours as needed. IM; 25-50mg every three or fours as needed.

(3) Hallucinations caused by psychosis - 50-100mg IM. Follow with 50-100mg three or four times a day.

G. Antifungal Agents:

1. Foot powder, fungicidal (Desenex^{R}). This powder contains 2% undecylenic acid and 20% zinc undecylenate. It retards fungus growth on the foot when used.

a. Use. Athlete's foot and for good personal foot hygiene.

b. Dose. Use one to two times daily dusting all footwear well with the powder. This foot powder ordinarily does not cure and must be followed up by a more specific antifungal agent.

2. Griseofulvin (Fulvicin^{R}, Fulvicin U/F^{R}, Grifulvin^{R}, Grifulvin V^{R}, and Grisactin^{R}). Griseofulvin is a systemic antifungal drug effective against common agents causing ringworm of the scalp and body, athlete's foot, and fungal infection of the nails.

a. Uses. If the drug is going to be effective, there is usually a decrease in symptoms within four days. For infections of all areas other than palms, soles, and nails, treatment should continue for at least three weeks. If the palms or soles are involved, treatment should be extended to about four to eight weeks; and if the nails are involved treatment should be continued for four to six months for fingernails. Toenails are not usually treated as they become reinfected nearly always.

b. Dose. Daily dose: children 30-50 pounds, 250 to 500mg; youngsters over 50 pounds, 0.5gm to 1.0gm; adults, 1.0gm. Daily dose should be divided into equal parts and given six hours after meals. Ringworm of the scalp in children is best treated by a single 3gm dose after a meal. Griseofulvin is supplied in tablets, 125mg; capsules, 125,250,500mg; and oral suspension, 250mg/5cc (teaspoon).

c. Side effects. Headache, stomach upset, allergic reactions, leukopenia, and photosensitivity.

3. Lidaform-HC^{R} - Otic (Lidocaine 3%, iodochlorhydroxyquin 3%, and hydrocortisone), 10cc bottle. This preparation is normally effective against fungal infections of the external ear canal.

a. Dose. Instill four drops q.i.d. or apply with a saturated wick of gauze which remains in the external ear canal.

b. Contraindications. Allergy, tuberculous ear infections, and viral ear infections.

4. Mycolog^{R} Cream (Nystatin, Neomycin, bacitracin with triamcinolone) ointment and cream. This combination is useful in the treatment of both fungal and bacterial skin infections. It also has some anti-itch as well as anti-inflammatory potency.

a. Use. Topical skin infections, especially those due to monilia and most types of bacteria.

b. Dose. Apply two to three times daily. Use ointment for dry lesions and cream for wet lesions.

c. Contraindications. Allergy, tuberculosis of the skin, and viral skin infections.

5. Mycostatin^{R} (Nystatin). The drug of choice in the treatment of infections due to Candida (Monilia). Also effective against other fungi.

a. Preparations:

(1) Ointment - 100,000 u/gm.

(2) Ointment containing nystatin, neomycin, gramicidin, and triamcinolone (a steroid) - Mycolog^{R}.

(3) Creams and powders - 100,000 u/gm.

(4) Tablets for oral therapy - 500,000 u.

(5) Tablets for vaginal use - 100,000 u.

(6) Flavored oral suspension - 100,000 u/5cc.

b. Uses. Infections due to Candida. Topical, apply t.i.d. Oral, 500,000 - 1,000,000 u. t.i.d. for adults and 100,000 u. three to four times a day for children; oral nystatin is useful only for fungal infections of the GI tract since it is not absorbed from the intestine to any extent. Vaginal, insert one to two times daily for one to two weeks.

c. Side effects. Uncommon. Nausea, vomiting, and diarrhea may occur temporarily with oral administration of the drug.

d. Contraindications. Allergy to the drug.

6. Tinactin^{R} (Tolnaftate), 1% solution in 10cc plastic bottles. A topical antifungal agent effective against a wide variety of fungal infections of the skin including tinea versicolor. It is much less effective against infections of the scalp and nails. It is not effective against Candida.

a. Uses. Ringworm of the body, athlete's foot, and tinea versicolor.

b. Dose. Two to three drops to the affected area (sufficient to cover an area such as the hand without leaving it wet) twice daily for two to three weeks is usually adequate.

c. Side effects. None (nonsensitizing). If patient shows no improvement after two to three weeks of therapy, the diagnosis should be reviewed.

7. Potassium permanganate. See Dermatology.

H. Antihistamines:

1. Benadryl^{R} (Diphenhydramine 50mg caps and injection 10mg/cc):

a. Uses. Diphenhydramine has antihistaminic actions which afford symptomatic relief from hay fever and other allergic entities. It has an antiemetic action, an anti-cough action, and reduces many tremors. Also it can be used as a sedative and a local analgesic. Principal use is in allergic disorders. Benadryl injection is indicated when local anesthesia is needed in patients allergic to lidocaine and novacaine. The amounts and injection methods are the same for Benadryl as with the local anesthetics. However, anesthesia is delayed until about 20 minutes after injection.

b. Side effects. Drowsiness is most common side effect. Dizziness, dryness of the mouth, nausea, and nervousness also result. It should not be given to patients with heart disease. Allergy occurs occasionally.

c. Dosage. Adults: 50mg three to four times daily is usually sufficient. Estimate: 1 mg/lb body wt/24 hours. Dosage governed by effect.

2. Bonine^{R} (Meclizine 25mg):

a. Uses. Antihistaminic properties especially effective for nausea and vomiting.

b. Side effects. Similar to Benadryl.

c. Dosage. Adults 25-50mg once daily.

3. Chlor-trimeton^{R}, Teldrin^{R} (Chlorpheniramine - 4mg, 8mg):

a. Uses. Allergic disorders and common colds.

b. Side effects. Similar to Benadryl plus drowsiness.

c. Dosage. Adults, 4mg three or four times daily (may try 8mg if 4mg is insufficient). Children, 1-2mg three or four times daily.

4. Co-pyronil^{R} (Pyrrobutamine compound). Contains methapyrilene, 25mg, a rapid acting antihistamine; pyrrobutamine, 15mg, a long acting antihistamine, and cyclopentamine, 12.5mg, a vasoconstrictor.

a. Uses. Allergic disorders and nasal congestion.

b. Side effects. Similar to Benadryl.

c. Dosage. Adults, one capsule every four to eight hours.

5. Coricidin^{R} (Contains chlorpheniramine, 2mg, aspirin, 390mg, caffeine, 30mg):

a. Uses. Similar to Chlor-Trimeton plus common colds.

b. Side effects. Similar to Chlor-Trimeton.

c. Dosage. Adults, one tablet every four hours, up to four tablets a day.

6. Dimetane^{R} (Brompheniramine, 4mg):

a. Uses. Useful in allergic disorders and common colds.

b. Side effects. Similar to benadryl; usually little drowsiness.

c. Dosage. Adults, 4-8mg three or four times daily. Children, 0.2mg/lb body wt/24 hours.

7. Dimetapp Extentabs^{R}. Contains brompheniramine 4mg (antihistamine), phenylephrine 5mg, and phenylpropanolamine 5mg (vasoconstrictor).

a. Uses. Same as Dimetane.

b. Side effects. Similar to Dimetane.

c. Dosage. One tablet twice daily in adults.

8. Dramamine^{R} (Dimenhydrinate, 50mg tablets, injection 50mg/cc):

a. Uses. Dramamine is only occasionally effective in controlling the dizziness, nausea, and vomiting of motion sickness and other clinical disorders. Dramamine belongs to the antihistaminic class of drugs although it is not commonly used for antihistaminic action.

b. Side effects. Drowsiness.

c. Dosage. Nausea and vomiting can sometimes be controlled in adults with a dosage of 50mg every four hours.

9. Ornade^{R} (Chlorpheniramine 8mg, phenylpropanolamine 50mg, and isopropamide 2.5mg):

a. Uses. Nasal congestion.

b. Side effects. Similar to Chlor-Trimeton. Less drowsiness, but more expensive than other antihistamines (may be increased to two capsules b.i.d. as with Dimetapp).

c. Dosage. Adults, one capsule twice daily.

10. Phenergan^{R} (Promethazine 12.5mg):

a. Uses. Wide spectrum of antihistaminic actions similar to Benadryl. Sedative action good. Phenergan is a phenothiazine (like Thorazine).

b. Side effects. Similar to Benadryl and Thorazine.

c. Dosage. Adults 12.5mg four times daily. Adjusted depending on response.

11. Temaril^{R} (Trimeprazine 2.5mg):

a. Uses. Itching from any cause.

b. Side effects. Drowsiness. Similar to Benadryl and rarely causes jaundice or nervous system reactions. Belongs to Phenothiazine class of drugs.

c. Dosage. 2.5mg four times a day. Can go as high as 80mg/24 hours in resistant adult patients.

I. Antimalarial Drugs:

1. Amodiaquine. This drug has action comparable to that of chloroquine which is given orally in the same regimen and dosage (not a standard item).

2. Chloroquine (Aralen^{R}, Avochlor^{R}, Nivaquine^{R}, Resochin^{R}):

a. Uses. In falciparum malaria the drug is very effective in controlling acute attacks most generally completely cures the disease. It is neither prophylactic nor always curative in vivax malaria. However, it can end an acute attack or suppress relapses.

b. Dosage. Available in 125 or 250mg tablets. Suppressive therapy, 0.5gm orally given on the same day of the week, continuing for six weeks after the last exposure in an endemic area.

c. Treatment. See Malaria.

d. Side effects. Transient headache, visual disturbances, gastro-intestinal upset, and pruritis. Prolonged treatment causes skin eruptions occasionally.

e. Contraindications. Should not be used in presence of liver disease. The drug should not be used during pregnancy except in treatment of malaria or amebic hepatitis when the indications may justify the risk of inducing fetal abnormalities.

3. Dapsone (DDS), 25mg tablets. This sulfone is effective both as a chemoprophylactic suppressant and as an adjunctive in the therapy of drug-resistant P. falciparum malaria with quinine and pyrimethamine to prevent recrudescence.

a. Dose and uses.

(1) Suppression, 25mg daily in addition to the weekly chloroquine-primaquine tablet.

(2) Therapy, 25mg daily from day 7 to day 34 of therapy.

b. Side effects. Methemoglobinemia; RBC hemolysis, and anemia in some individuals. CNS stimulation in toxic doses. The RBC's of patients on Dapsone may be altered so that routine staining does not reveal malaria parasites. It may be necessary to stop the drug temporarily in order to establish a diagnosis by direct smear.

4. Primaquine. Primaquine phosphate is supplied in tablets containing 26.3mg of the salt, equivalent to 15mg of base. The dosage is usually expressed in terms of the base.

a. Uses. Primaquine is highly active against vivax malaria and its clinical value lies in the radically curative treatment of vivax malaria. It has some value in the prophylactic role.

b. Dosage. Primaquine is always given orally. 15mg of primaquine base daily for 14 days for acute attacks of P. Vivax. Chloroquin should be given concomitantly.

c. Side effects. Mild to moderate abdominal cramps, mild anemias, and cyanosis (Methemoglobinemia). Blood dyscrasias may occur, but are rare. This is mainly exhibited as destruction of RBCs and is more common in Negroes and dark skinned people. Primaquine is contraindicated in acutely ill patient suffering from active rheumatoid arthritis.

5. Pyrimethamine (Daraprim^{R}, Malocide^{R}, tablets 25mg; elixir, 6.25mg/4cc):

a. Uses. Treatment of acute attacks of drug-resistant P. falciparum malaria in combination with quinine.

b. Side effects. Anemia (folic acid deficiency type) corrected by treatment with folic or folinic acid. Bone marrow suppression with anemia, granulocytopenis, and thrombocytopenia have been reported. Other toxic manifestations include ulceration of mucosa, skin pigmentation, and seizure disorders.

6. Quinacrine (Atrabrine^{R}, Atebrin^{R}, Mepacrine^{R}, 50 and 100mg tablets):

a. Uses. Suppressive treatment of malaria, Giardia Lamblia infestation, and tape worm. It is neither a radical curative nor causal prophylactic agent.

b. Dosage. Acute clinical attacks of malaria: 0.2gm with 1.0gm sodium bicarbonate and 200-300ml of water. This is repeated in four to six hours for five doses then 0.1gm is given three times a day for six days. For suppressive therapy the dose schedule is 0.1gm daily. Giardiasis, 0.1gm three times a day for five days. Tapeworm, 1gm orally, the dose may be divided to avoid vomiting, but must be given every 30 minutes (see section on Antihelmentics).

c. Side effects. Mild nausea, vomiting, abdominal cramps, and diarrhea. Enormous doses of quinacrine may be fatal.

7. Quinine (325mg tablets):

a. Uses. Quinine is effective both as a suppressive drug and in the control of overt clinical attacks of Falciparum malaria of the drug-resistant type.

b. Dosages. For acute attacks, 975mg, three times daily for two days, then for suppressive therapy, 325 to 650mg daily. When given parenterally, quinine must be given slowly in IV saline. If given rapidly, the heart rhythm may be upset; if given directly IV sloughing will occur.

c. Side effects. Hearing and vision may be disturbed, tinnitus, decrease in auditory acuity, and vertigo. Severe disturbances of vision and night blindness may also occur. Gastrointestinal symptoms are prominent; nausea, vomiting, abdominal pain, and diarrhea occur. Renal damage may occur with quinine toxicity.

d. Contraindications. Pregnant women near term should not be given quinine unless absolutely necessary. The drug should not be used in patients with optic nerve inflammation or patients with tinnitus (ringing in the ears).

J. Antispasmodics:

1. Atropine (tablets, extract, and injectable). Atropine is one of a number of Balladonna alkaloids. It is a parasympathetic blocking agent that decreases secretions and is an antispasmodic for smooth muscle.

a. Uses. Pre-anesthetic medication, renal or biliary colic, anti-cholinesterase (nerve gas) poisoning, pupillary dilation (Homatropine preferred), peptic ulcer, and gastroenteritis (Pre-Banthine preferred).

b. Dosage and preparations. Atropine sulfate, 0.5mg tablets, 0.4mg/cc injection; average adult dose, 0.5mg orally, Sub Q, or IV every six hours. Balladonne Tincture, 0.6cc (contains approximately 0.2mg of atropine) every six hours P.O. with water or juice. Topical 1% solution for pupillary dilation, one to two drops. Dosage for nerve gas poisoning, 2-3mg Sub Q at frequent intervals depending on severity of symptoms (up to 500mg total dose of atropine has been used in the past).

c. Side effects. Impotence and constipation, temporary. Central nervous system stimulation in toxic doses (over 5mg) including restlessness progressing to delerium and coma with higher doses. Cardiovascular system, rapid heart rate, pulse weak. Other, blurred vision, dry mouth, dry hot skin, and extreme pupillary dilation.

d. Contraindications. Patients with glaucoma and allergy to atropine or belladonna alkaloids.

2. Combid spansules^{R} (Compazine, 10mg; Isopropamide, 5mg):

a. Uses. Gastrointestinal conditions associated with nausea and cramping (peptic ulcer, gastroenteritis, genitourinary spasm).

b. Side effects. Same as for Thorazine.

c. Dosage. One capsule every 12 hours. Isopropanide is a good antispasmodic to counter gastrointestinal spasm; therefore, Combid rather than Compazine is indicated when treating nausea with spasm.

3. Donnatal^{R} (Balladonna alkaloids and phenobarbital). Each tablet or 5cc contains 16.2mg phenobarbital, hyoscyamine 0.1mg, atropine 0.02mg, and hyoscyamine hydrobromide 0.0065mg plus B-complex vitamins.

a. Uses. It is used as an anticholinergic agent to decrease gastrointestinal secretions and to decrease gastrointestinal motility.

b. Dosage. One to two tablets (5-10cc) t.i.d.

c. Side effects. Discontinue in cases of blurred vision, rapid pulse, or dizziness.

d. Contraindications. Glaucoma, advanced liver or kidney disease, allergy to any of the components. Phenobarbital may be habit forming.

4. Pro-Bathine^{R} (Propantheline), 15 and 30mg tablets; available with 15mg phenobarbital. An anticholinergic and antispasmodic drug which is more potent in inhibiting the gastrointestinal tract than atropine with fewer side effects.

a. Uses. Peptic ulcer, gastritis, mild diarrhea, biliary and renal colic, and acute pancreatitis.

b. Dosage. 15mg t.i.d. and 30mg prior to bedtime P.O. Patients with severe symptoms may require up to 30mg t.i.d.

c. Side effects. Varying degrees of dryness of the mouth, pupillary dilation and blurred vision, hesitancy of urination, and gastric fullness.

d. Contraindications. Patients with glaucoma and severe cardiac disease.

K. Biologicals:

1. Cholera vaccine. Cholera vaccine consists of a sterile suspension of highly antigenic killed cholera vibrios.

a. Dose. The basic series consists of two injections. The first is 0.5cc, the second 1.0cc given four or more weeks apart. They are given subcutaneously. Reimmunization is every six months (0.5cc).

b. Side effects. Local reactions consisting of redness, tenderness, and induration may appear at the site of injection in about eight hours. Some patients may have headache, malaise, and fever; systemic reactions are usually mild and subside within a few days.

c. Contraindications. Previous allergic reaction to this vaccine.

2. Influenza virus vaccine. Influenza virus vaccine is prepared from embryonated chicken eggs infected with the influenza virus.

a. Dosage. The initial dose for adults is 1.0cc IM.

b. Side effects. The injection of this vaccine may be accompanied by a stinging sensation for a short interval immediately after administration. It may also be associated with a mild localized reaction which generally does not last for more than 24 hours. Mild systemic reactions are frequent. Care should be taken not to inject this vaccine intravenously. General contraindications for vaccination such as tuberculosis, debilitating diseases, and other infections should be considered.

c. Contraindications. Persons who are known to be allergic to egg, chicken, or chicken feathers may have an allergic reaction to this vaccine. Immunization of such persons should not be attempted.

3. Plague vaccine. Plague vaccine contains killed plague bacteria.

a. Dosage. Primary immunization consists of two injections given IM. The first injection is 1.0cc and the second is 0.2cc given after four or more weeks. Booster injections of 0.2cc should be administered every six months to individuals remaining in a known plague area. The vaccine is only about 70% effective.

b. Side effects. Primary immunization may result in general malaise, headache, local erythema, induration, mild lymphadenopathy, and fever. Booster injections give an increased frequency of reactions. A few cases of sensitivity reactions manifested by urticarial and asthmatic phenomena have been reported.

c. Contraindications. None. It is advisable; however, not to give injections to patients with upper respiratory infections because more severe reactions may follow.

4. Tuberculin Purified Protein Derivative (PPD). The intermediate test strength is designed for use as a single test dose in detection of converters. Solutions of PPD are unstable and should be freshly prepared. In order to prevent deterioration, the mixed solution should be stored between 2 and 10°C (35°-50°F) for no longer than three days. Only the sterile buffered diluent prepared especially for use with Tuberculin-PPD tablets should be used for testing.

a. Dosage. 0.1cc intradermally with a 1.0cc tuberculin syringe. Care should be taken to avoid subcutaneous injection since this will produce no local reaction and may result in a general febrile reaction.

b. Interpretation. Reactions should be read 48-72 hours after injection. The reaction is reported in the number of millimeters of swelling (induration). (Do not report reaction in terms of "negative" or "positive".) Induration should be measured at its widest diameter. Greater than ten minutes duration is positive evidence of infection, but not active disease.

5. Polio vaccine (oral). Oral polio vaccine is a mixture of three types of polio viruses which have been propagated in monkey kidney tissue culture.

a. Dosage. This vaccine is to be administered orally. The dose may be administered directly from the dropper furnished in the package, or it may be mixed with liquids such as water containing no free chlorine, simple syrup, or milk; or it may be absorbed on solid substances such as bread, cake, and cube sugar. To assure proper dosage, the dropper should be held so that the opening at the tip is in a horizontal plane. The dose is two drops of the vaccine. Initial immunization consist of two doses of two drops each given at least eight weeks apart. Infants should receive a third dose about eight months later.

b. Storage. It is necessary to store this vaccine in the freezer compartment of a refrigerator. Once opened, a container must be used within a seven day period, during which time it must be stored at a temperature no higher than 45°F.

c. Precautions. Administration of the vaccine should be postponed in those suffering from any acute illness. Because the efficacy of oral polio vaccine depends upon multiplication of the virus within the intestinal tract, immunization should be postponed if there is persistant vomiting or diarrhea. The usual color of the vaccine when stored below 5°C is pink. If a multiple dose container of vaccine turns from pink to yellow after it has been opened, it should not be used since this may be an indication of bacterial contamination.

d. Side effects. Side effects of significance have not been reported.

6. Smallpox vaccine. Smallpox vaccine is supplied in liquid form in individual doses sealed in glass tubes which must be stored below 32°F and in dry form as Dryvax, dried smallpox vaccine, which needs reconstitution before use. Store at 35° to 50°F. Retains full potency for three months after being reconstituted. It is administered over deltoid region by multiple pressure technique.

a. Precautions. Prepare the vaccination site with acetone or ether, not alcohol. Allow it to dry. After vaccination blot off excess with clean dry cotton. The vaccination site should not be washed off for 24 hours.

b. Contraindications. Infants manifesting failure to thrive; individuals of any age with eczema or other open skin conditions, burns, or wounds; during pregnancy; and persons receiving therapy with x-ray, ACTH, or corticosteroids.

c. Reactions. Reaction to primary vaccination consists of formation of a pustule in two to three days. This progresses for about one week to 0.5 to 1.0cm in size with surrounding erythema, local heat, and pain. This is frequently accompanied by fever. This gradually subsides with formation of an eschar which drops off at about four to six weeks. Reaction to subsequent vaccinations is less severe and is rarely accompanied by systemic symptoms.

d. Interpretation. The vaccination site should be inspected six to eight days after vaccination and the response interpreted as follows:

(1) Primary vaccination. A primary vaccination which is successful should show a typical vesicle. If none is observed, vaccination procedures should be checked and vaccination repeated with another lot of vaccine until a successful result is obtained. Reactions will be recorded as successful or unsuccessful.

(2) Revaccination. Following revaccination, two responses are defined by the WHO Expert Committee on Smallpox. The use of older terms such as accelerated and immune will be discontinued.

(a) "Major Reaction." A vesicular or pustular lesion of an area of definite palpable induration or congestion surrounding a central lesion which may be a crust or ulcer. This reaction indicates that virus multiplication has most likely taken place and that the revaccination is successful.

(b) "Equivocal Reaction." Any other reaction should be regarded as equivocal. These responses may be the consequence of immunity adequate to suppress virus multiplication or may represent only allergic reactions to an inactive vaccine. If an equivocal reaction is observed, revaccination procedures should be checked and revaccination repeated one time.

7. Tetanus and tetanus-diphtheria vaccine. Tetanus and diphtheria toxoids combined is used for active immunization of children over eight years of age and for adults. Active immunization for tetanus is indicated for all adults. This product also takes advantage of the fact that repeated small doses of diphtheria toxin are capable of producing immunity to diphtheria. This is true whether they have had prior immunization for diphtheria or not, and does not lead to more than minor reactions.

a. Dosage. The basic immunizing course consists of two doses of 0.5cc given four to eight weeks apart followed by a third dose in six to twelve months. Injection should be given IM. A booster of 0.5cc should be given every six years. Upon exposure to diphtheria, an emergency booster dose of 0.5cc should be given. In the event of injury for which tetanus prophylaxis is indicated, a booster dose of 0.5cc of the tetanus toxoid is indicated.

b. Contraindications. An acute respiratory infection or other acute infection is reason for deferring elective administration.

c. Side effects. Local reactions consisting of erythema, induration, and soreness at the site of injection may occur in some patients. Systemic reactions are manifested by fever, chills, and malaise which may or may not be accompanied by local reaction. Reactions are apparently most often the result of hypersensitivity to the diphtheria toxoid. Reactions occur more frequently in individuals over the age of 40. Individuals manifesting significant local or systemic reactions should have their tetanus immunization continued with the single antigen, tetanus toxoid.

8. Typhoid-paratyphoid vaccine. Typhoid and paratyphoid vaccine is a combination of three intermediate stock vaccines containing Salmonella typhosa, Salmonella paratyphi, and Salmonella schottmuelleri. The vaccine contains the killed bacilli.

a. Dosage. Two injections of 0.5cc four or more weeks apart given sub-Q or IM. Boosters are given yearly. Guard against intravenous injection. Do not give to those who have a fever.

b. Side effects. Local erythema, induration, edema, and pain.

9. Typhus vaccine (louse-borne). Epidemic typhus vaccine is used for immunization against classic epidemic typhus also known as louse-borne or European type. It does not confer protection against endemic (murine, flea-borne) typhus of scrub (tsutsugamushi, mite-borne, Japanese-River) typhus. Typhus vaccine is indicated for persons exposed to epidemic typhus fever or to its vectors (human body lice).

a. Dosage. Two injections of 0.5cc Sub Q or IM at intervals of not less than four weeks. Reimmunization dose is 0.5cc. Shake well before using. Care should be taken not to inject the vaccine intravenously. Persons who are known to be allergic to egg, chicken, or chicken feathers may have an allergic reaction to this vaccine. Immunization of such persons should not be attempted.

10. Yellow fever vaccine. Yellow fever vaccine is prepared by culturing the yellow fever virus in the living chick embryo. The vaccine is frozen and dried. It must be reconstituted immediately before use. All dehydrated vaccine and containers which remain unused after one hour must be sterilized and discarded. Yellow fever vaccine is shipped in dry ice. Do not use vaccine unless some dry ice is present on arrival. Vaccine must be maintained continuously at a temperature below 0°C.

a. Dosage. Shake well before withdrawing each dose. The dose of 0.5cc is then given Sub Q at once. Children receive the same dose as adults. Immunity develops by the 7th day and probably lasts for many years. Reimmunization is required after six years.

b. Side effects. Approximately 10% of patients may have fever or malaise.

c. Contraindications. Proved sensitivity to egg or chicken protein.

L. Drugs Affecting the Central Nervous System:

1. The amphetamines (Benzedrine^{R}, Dexedrine^{R}, etc.) Amphetamine and dextroamphetamine, 5mg tablets. Amphetamine is a potent CNS stimulant having sympathomimetic effect. Addiction often occurs with amphetamines and tolerance almost invariably develops after utilization regularly for over one month. Patients seem to have an increasing need for larger doses in order to maintain improvement of mood.

a. Uses. The main use of amphetamine today is in the treatment of obesity because of its appetite depressant effects. The drug is also used as a mood elevator and for fatigue. The need for sleep may be postponed but it cannot be indefinitely avoided. The alertness benefit of the drug is usually paid for by excessive fatigue and depression after the medication wears off. It should not be used indiscriminately.

b. Dosage. Usually 5mg two or three times a day will provide therapeutic effect. The parenteral dose is 10mg subcutaneous.

c. Side effects. Restlessness, dizziness, tremor, irritability, and insomnia. Psychotic episodes such as hallucinations, panic states, and suicidal or homicidal tendencies may occur, especially in mentally ill patients. Cardiac arrhythmias, anginal pain, and hypertension may also occur.

2. Dilantin^{R} (Diphenylhydantoin, 100mg capsule; suspension, 100mg/4cc). Dilantin exerts anti-seizure activity without causing general CNS depression.

a. Uses. Grand mal epilepsy, dilantin may abolish seizures completely in 60-65% of patients and reduce their frequency and security in another 20%. It is commonly used in conjunction with phenobarbital for grand mal seizures. Diphenylhydantoin is also used in focal cortical seizures and psychomotor seizures. The drug has less effect in petit mal. In the emergency treatment of status epileptius, dilantin may not act rapidly enough to be of benefit.

b. Dosage. Several days are required to achieve adequate anti-convulsant levels. The initial dose is 100mg P.O. three times a day, gradually increased to 300mg or 400mg in adults. Children over six may be started on the adult dosage and individually adjusted. Each patient should have his medication adjusted individually because some require more than others to control seizures.

c. Side effects. CNS, loss of muscular coordination, nervousness, nystagmus, double vision, blurred vision, and slurring of speech. Deaths are rare from overdose. Gastric upset may occur, but may be avoided by taking the medication with meals. Hyperplasia of the gums is common but the condition does not require withdrawal of the drug.

M. Cough Preparations:

1. Benylin Expectorant^{R}:

a. Use. An anti-cough drug and expectorant for relief of coughs due to colds, other symptoms associated with colds, and coughs of allergic origin.

b. Dosage. Each 5cc of Benylin expectorant contains benadryl, 20mg, ammonium chloride, 125mg, sodium citrate, 50mg, chloroform, 20mg, and menthol, 1mg, in alcohol (5%). Adults, one to two teaspoons q.i.d. Children over one year, one-half to one teaspoon three or four times daily.

c. Side effects. See Benadryl in section on antihistamines.

2. Robitussin^{R} (glyceryl guaiacolate 100mg/5cc):

a. Uses. Glyceryl guaiacolate is an effective, long lasting expectorant which helps to liquify tracheobronchial secretions allowing them to be coughed up; thereby, decreasing the frequency of dry non-productive coughs. It is useful in treating coughs associated with head and chest colds, bronchitis, whooping cough, and influenza.

b. Dosage. Adults, one teaspoon every three to four hours. Children, six to twelve years, one-half adult dose. Children, three to six years, one-quarter adult dose.

c. Side effects. None.

3. Terpinhydrate, elixir (ETH):

a. Uses. An effective antitussive which acts through its effects as an expectorant. Can be used in the same conditions listed for glyceryl guaiacolate. Elixir terpin hydrate with codeine - also available. This combines the expectorant action of terpin hydrate with the potent anti-cough action of codeine (see section on Codeine in Analgesics). This preparation is especially good for the persistent dry "hacking" cough.

b. Dosage. One to two teaspoons every four to six hours.

c. Side effects. None.

N. Emetics ipecac (Syrup of Ipecac). This liquid is a good emetic. The vagal discharge caused by the CNS action of the drug causes vomiting and a temporary slowing of the heart. Dosage is 10-30cc P.O. which causes emesis in 10-60 minutes. 0.5-1cc P.O. q.i.d. may be used as an expectorant. It is used as an expectorant and emetic. Dosage should be limited in children. Syrup of Ipecac should not be confused with fluid extract of Ipecac which is several times stronger. It should not be used in its concentrated form.

O. Hematinics. Iron sulfate (ferrous sulfate 324mg). Ferrous sulfate is a hematinic which is used in the treatment of iron deficiency anemias such as are seen as a result of chronic blood loss, nutritional deficiency, pregnancy, or parasitic infestation. The cause of the anemia should always be known before treatment is begun. The usual side effects are gastric distress and diarrhea. The stools normally turn dark during the period of administration of the drug. Usual dose is 324mg three times a day with meals.

P. Hemostatis agents:

1. Gelfoam^{R} (sponge, absorbable gelatin):

a. Uses. Gelfoam is a sterile, absorbable, water-insoluble gelatin base sponge. It is indicated in the control of capillary bleeding and oozing.

b. Dosage. Gelfoam may be applied in amounts sufficient to cover the bleeding surfaces. It should first be moistened thoroughly with sterile isotonic sodium chloride solution.

c. Side effects. None.

2. Oxycel^{R} (cellulose, oxidized):

a. Use. Oxycel is a specially treated form of surgical gauze or cotton used in the control of capillary, venous, or small arterial hemorrhages. It exerts a hemostatic effect by the formation of an artificial clot and it is absorbable when buried in the tissue.

b. Dosage. Only the minimum amount of oxidized cellulose necessary to control hemorrhage should be used. It should be applied in the dry form.

c. Side effects. None.

Q. Laxatives:

1. Cascara sagrada, 250mg tablets and fluid extract, aromatic. A cathartic which acts by the slow liberation of irritant derivatives in the gut. Its action is mild. A therapeutic dose causes a solid or semi-solid stool in about eight hours. The usual dose is one tablet or 2ml at bedtime.

2. Dulcolax^{R} (bisacodyl, 5mg tablets). Dulcolax may be used whenever constipation is a problem. Administration results in increased peristaltic contractions of the colon. Usual dosage for adults is two or three tablets at night.

3. Magnesium sulfate ($MgSO_4$), crystals. Magnesium sulfate is a saline cathartic much like sodium sulfate and sodium phosphate. A full dose (15gm) causes a semifluid or water evacuation in three to six hours. It is used for poisoning (full dose) and constipation (5gm or more). Usual dose is 5-15gm orally. These salts should be used with extreme caution in patients with renal disease, cardiac disease, or edema.

4. Senokot^{R} (standardized senna concentrate, 275mg tablets). Indicated for the relief of functional constipation. Adults, two to four tablets at bedtime.

R. Ophthalmic Drugs:

1. Fluorescein dye (2% ophthalmic solution, Fluor-I-Strip applicators). Fluorescein dye has some antibacterial potency, but its use is most important simply because it is a diagnostic agent, revealing traumatized tissues in the eye.

a. Use. When a drop of 2% solution or a strip is applied to the eye, topically: ulcerated areas are stained green, foreign bodies are surrounded by a green ring, and loss of substance in the conjunctiva is indicated by a yellow stain. Ultraviolet light makes the stain stand out more brightly but its use is not mandatory for visualization of most injuries.

b. Side effects. Allergy has not been reported.

c. Contraindications. None.

2. Homatropine, 2% ophthalmic solution. It has only about one-tenth the potency of atropine. Used topically for pupillary dilation and in treatment of painful eye inflammation. Dosage is one to two drops, repeated every three to four hours as necessary. Contraindications are glaucoma and hypersensitivity to belladonna alkaloids. Significant light sensitivity and blurring of vision occurs while the drug is effective (up to four or five hours).

3. Neosporin^{R} ointment (one-eighth ounce tube, ophthalmic; solution, 10cc). Ointment contains Polymyxin B, Bacitracin, and Neomycin. Solution contains the same antibiotics except Gramicidin replaces Bacitracin. This combination should be used if more simple medications fail to be effective. Neomycin sometimes causes mild irritation to the eyes.

4. Ophthaine^{R} (Proparacaine Hcl), 15cc squeeze bottle. See Anesthetics.

5. Sulfacetamide drops (30%) and ointment (10%). Dosage is two to three drops or small amount of ointment t.i.d.

6. Tearisol^{R} (methylcellulose ophthalmic solution), 15cc vials. Methylcellulose ophthalmic solution is an isotonic soothing solution which closely approximates natural tears. Principal uses are contact lens fluid, irritative eye conditions, and after tonometry (measurement of intraocular pressure, mild eye infections for relief of discomfort only). Dosage is two drops in eye three or four times daily or PRN. There are no contraindications.

S. Otic Drugs:

1. Auralgan^{R} (Glycerin, antipyrine, benzacaine), 15cc bottle. This solution is indicated for relief of pain and reduction of inflammation in acute otitis media and otitis externa. Instill sufficient solution to fill the ear and prevent escape by inserting a cotton pledget previously moistened with the solution. Repeat q one to two hours PRN. It may also be used to remove impacted cerumen by instillation t.i.d. for two days followed by irrigation with warm water.

2. Cerumenex^{R} drops (triethanolamine condensate), 8 and 15cc bottles. This agent is unique for removal of impacted or excess cerumen. It is highly effective usually with a single treatment. Fill canal (tilting head at 45° angle) and plug with cotton. After 15-30 minutes, irrigate canal with warm water. Allergy has been reported.

3. Cortisporin^{R} ointment - otic drops (Polymyxin B and Neomycin with Hydrocortisone, 1%), 5 and 10cc bottles. Used for external otitis due to bacterial infection. Apply two to four times daily. Use cotton pledget to prevent leakage. Contraindication is allergy to any component.

4. Lidaform-HC^{R} - otic (lidocaine, 3%, iodochlorhydroxyquin, 3%, and hydrocortisone), 10cc bottle. This preparation is normally effective against fungal infections of the external ear canal. Instill four drops q.i.d. or apply with a saturated wick of gauze which remains in the external ear canal. Contraindications are allergy, tuberculous ear infections, and viral ear infections.

T. Steroids:

1. Cortisone acetate (cortone acetate 5mg, 25mg tablets; suspension for injection 25mg/cc).

a. Uses. Cortisone is a steriod which is obtained from the adrenal cortex and affects fat, protein, and carbohydrate metabolism. The drug causes hyperglycemia, glycosuria, and loss of body protein unless adequate protein is supplied. Cortisone causes some sodium retention and potassium excretion which can lead to electrolyte imbalance when large doses are given over a period of several days. Cortisone is used as substitution therapy in adrenal insufficiency, in arthritis, and in certain allergic states, acute asthma and some kinds of shock.

b. Dosage. Usual oral dose is 25mg four times a day. The usual IM dose is 100mg daily.

c. Side effects. Cortisone acetate is contraindicated in diabetes mellitus, congestive heart failure, active or latent tuberculosis, mental disturbances, and chronic hephritis. Side effects include Cushing's syndrome, petechiae, easy Bruisina, peptic ulcer disease, loss of minerals in the bones, and fluid retention.

2. Hydrocortisone acetate (Cortef^{R} tablets, 5,10,25mg; ointment 1% and 2.5%; injectable 50mg/cc).

a. Uses. This drug is less soluble in body fluids than hydrocortisone or cortisone and is used mainly for intra-articular injection in the case of inflamed arthritic joints.

b. Dosage. Intra-articular injection, 5-30mg depending on the size of the joint.

c. Side effects. Same as for cortisone but occurs less frequently.

3. Prednisone, 5mg tablets (prednisolone is equivalent in action and potency).

a. Uses. Prednisone has the same actions and uses as cortisone. On a weight basis prednisone has three to five times the anti-inflammatory activity of cortisone of hydrocortisone. Prednisone is of value in the symptomatic management of allergic states, especially intractable bronchial asthma, as well as severe contact dermatitis.

b. Dosage. For mild conditions, 5-25mg daily. For severe conditions, 30-50mg daily. For severe poisonivy type reactions or mumps orchitis give tab ii q.i.d. first day, tab ii t.i.d. second day, tab i q.i.d. third day, and tab i t.i.d. fourth day.

c. Side effects. The same as for the other steroids.

4. Solu-cortef^{R} (hydrocortisone sodium succinate injection, 100 and 250mg vials).

a. Uses. Due to its high solubility, this drug is used for parenteral administration in the management of emergencies amendable to intense corticoid therapy. The drug is used in shock-like syndromes resulting from acute adrenal damage, acute hypersensitivity reactions, severe bronchial asthma, and shock. It may be life-saving in treating acute cerebral edema such as occurs with injury or illness (i.e. malaria) of the brain.

b. Dosage. In emergency situations, 100mg (2cc) is given intravenously over a period of at least one-half minute.

c. Side effects. Same as those for cortisone acetate.

U. Tranquilizers and Sedatives:

1. Amytal[R] (amobarbital sodium 100mg/cc, parenteral form; amobarbital 65mg and 200mg capsules, oral form). This drug may be habit forming.

a. Uses. Amytal is a barbiturate of moderate duration of action. It may be used IV or IM for the control of convulsive seizures. Orally, it can be used in any condition requiring sedation for the relief of anxiety and tension. IV amytal must be given slowly. If given rapidly it may cause serious respiratory depression.

b. Dosage. The usual adult dose for daytime sedation is 30-50mg two or three times daily. The usual dose for night-sleep is 100-200mg. For convulsive seizures in adults the usual range is 250mg to 1gm IV slowly.

c. Side effects. Idiosyncracy, in the form of excitement, hangover or pain may appear. Hypersensitivity reactions may occur. Amytal may be habit forming.

2. Chloral hydrate (Noctec[R] 250 and 500mg tablets; elixir 50 and 100 mg/cc). The drug is used mainly as a sedative and is relatively safe. This drug can cause gastric irritation on an empty stomach. Dosage is usually 500mg to 1.0gm P.O. q h s for adults.

3. Compazine[R] (Prochlorperazine). For a discussion of this drug, see the section on Anti-emetics.

4. Meprobamate, 400mg tablets (Miltown[R], Equanil[R]).

a. Uses. Meprobamate is an antianxiety agent with muscle-relaxing properties. Meprobamate is indicated in the treatment of anxiety and tension states and in conditions in which muscle spasm is a factor. Side effects are drowsiness and allergic reactions such as hives, fainting spells, and bronchial asthma. Dosage is 400mg P.O. three or four times a day. May be habit forming.

5. Nembutal sodium[R] (pentobarbital sodium capsules, 30,50,100mg; injection 50mg/cc). This drug may be habit forming. Nembutal is a short acting barbiturate and is used in insomnia, anxiety states, hysteria, and tetanus. Side effects are the same as for amobarbital. Sedative dose, 25-50mg. Hypnotic dose, 100mg (for sleep).

6. Pentothal sodium[R] (thiopental sodium, 25mg/cc). Thiopental is an ultrashort-acting barbiturate. When injected IV it is a quick-acting, general anesthetic. Side effects are the same as for amobarbital. Dosage is intravenously, 2 or 3ml of a 2.5% solution is injected in about 10 or 15 seconds. If relaxation has not occurred in 30-35 seconds, an additional 2 or 3ml may be injected at the same rate as before.

7. Phenobarbital (Luminal[R]). Phenobarbital is classified as a long-acting barbiturate. The drug is used as a sedative, hypnotic, anticonvulsant, and antiepileptic. Side effects are essentially the same as those for amobarbital. The usual adult dose is 32mg (1/2 gr) given two to four times daily. Warning: may be habit forming. Duration, six hours.

8. Seconal[R] (secobarbital sodium, capsules, 50 and 100mg; injectable 50mg/cc). Seconal is a short acting barbiturate. It is used as a sedative, hypnotic, and pre-anesthetic medication. Duration, two hours. Side effects are essentially the same as for amobarbital. The hypnotic dose for adults is 100-200mg and the sedative dose is 50mg. Warning: may be habit forming.

9. Thorazine[R] (chlorpromazine). For a discussion of this drug, see the section on Anti-emetics.

V. Vasopressor Agents:

1. Aramine[R] (metaraminol injection), 10mg/cc, 1cc tubes, 10cc vials. Aramine is a synthetic hypertensive agent useful in the treatment of certain types of hypotensive states not due to blood loss.

a. Uses. Hypotension due to spinal anesthesia, reserpine overdose, myocardial infarction, anaphylaxis.

b. Dosage. IM or Sub Q, 2-10mg (0.2-1.0cc) IV, 15-100mg in 500cc IV fluid (D5W, D5S, NS, etc.), drip rate of IV adjusted as needed.

c. Side effects. Rarely, sloughling or abscess at injection site. The drug should be used cautiously in patients with known heart disease, thyroid disease, diabetes, and hypertension. It may provoke a relapse in patients with a history of malaria.

2. Ephedrine, tablets and capsules, 15, 25, 30, 50mg. An effective decongestant and bronchodilator with other, less important pressor effects. Used as a decongestant (colds, otitis media, etc.) and bronchodilator for asthmatics. Dosage is 15-50mg every three to four hours orally. Side effects are similar to epinephrine.

3. Epinephrine (Adrenalin^{R}). Epinephrine is a drug having significant effects on the heart and blood vessels. It causes a temporary increase in blood pressure, increased heart rate and strength, and most importantly, constriction of arterioles in tissues throughout the body. It also is a potent bronchodilator. It is supplied in 1:1000 aqueous solution, 1:100 aqueous solution, 1:500 epinephrine in oil, suppositories, and vaporizer (Medihaler - Epi).

a. Dosage and Uses. Bronchospasm, 0.3 - 0.4cc aqueous 1:1000 epinephrine Sub Q in adults repeated q 15 minutes. PRN. (0.5cc of epinephrine in oil will last several hours.)

(1) Severe allergic urticaria (hives). Same as above dose.

(2) Anaphylactic shock and acute laryngeal edema, 1.0cc 1:1000 aqueous Epinephrine IV.

(3) Cardiac arrest, using a long spinal needle, intracardiac dose, 0.5cc 1:1000 solution; IV dose, 1.0cc of 1:1000 solution.

(4) To prolong local anesthetic effect, mix 0.1cc 1:1000 aqueous solution with 10cc of plain Lidocaine to extend effect by one and one-half to two hours. (CAUTION: Do not use epinephrine in "ring" blocks of fingers, toes, or penis.)

b. Side effects. Restlessness, apprehension, headache, and tremors are transient effects after therapeutic doses.

c. Contraindications. Hyperthyroidism, hypertension, angina pectoris, and cerebral hemorrhage.

4. Neosynephrine^{R} (Phenylephrine), 20cc bottle intranasal solution. This drug is excellent for relatively short-term relief of nasal congestion due to allergy or infection. Adults, four drops of 1/4% solution q four hours Young children and infants, four drops of 1/8% solution q four hours. Generally no side effects. Systemic side effects such as tremulousness, insomnia, and palpitation rarely occur. "Rebound" swelling of the nasal mucosa may occur after use for more than three or four consecutive days. This can be avoided if the drug is discontinued for 24 hours every fourth day if prolonged use is necessary.

W. Miscellaneous:

1. Anusol[R]. Anusol is a preparation similar to Wyanoids-HC without Belladonna and ephedrine. Anusol-HC[R] is also available in boxes of 12 suppositories. Hydrocortisone is especially indicated for cases with significant itching.

2. Eurax[R]. Soothing cream. Use every six hours to prevent itching. Scabies, use twice.

3. Kwell[R] cream, lotion, shampoo (gamma benzene hexachloride). Cream, two ounce tube and one pound jar; lotion, two ounce and one pint bottles; shampoo, two and 16 fluid ounces. Kwell is a drug which is promptly curative in scabies and pediculosis. Often effective after only one treatment. Apply liberally to affected area after thorough cleansing of the affected area. If necessary, repeat after four days. Wash off in 24 hours. Side effect is irritation if it gets into the eyes.

4. Tedral[R] (each tablet contains: theophylline, 130mg; ephedrine, 24mg; phenobarbital, 8mg).

a. Use. This bronchodilator-sedative combination tablet is used in the treatment of bronchial asthma, asthmatic bronchitis, and other bronchospastic disorders. It may be used prophylactically to abort asthmatic episodes.

b. Dosage. Adults, one to two tablets every four hours. Children, 6 to 12 years, one-half the adult dose. Never exceed two tablets in a four hour period.

c. Side effects. Mild gastric distress, palpitation, tremulousness, insomnia, difficulty in urination, and CNS stimulation.

d. Contraindications. Allergy to any of the ingredients. Use with caution in patients with cardiovascular disease, hypertension, prostatic hypertrophy, or glaucoma.

5. Wyanoids[R]-HC rectal suppositories (box of 12). Each suppository contains 10mg hydrocortisone, 15mg belladonna extract, 3mg ephedrine, 176mg zinc oxide, and other soothing ingredients.

a. Use. Painful rectal hemorrhoids.

b. Dosage. One suppository inserted rectally bid for six days or as required. (Supplement with hot sitz baths.) Because of Belladonna content, these should not be used in patients with glaucoma or pyloric stenosis. They should be used with caution in prostatism, urinary retention, elderly persons, and children under six years of age. If eye pain occurs, the drug should be discontinued since this may indicate undiagnosed glaucoma.

6. Zinc oxide powder, one-quarter pound plastic bottles. This white powder is mixed with eugenol to form a paste which may serve as a temporary dental filling.

APPENDIX 28

FEATURES OF SOME INFECTIOUS DISEASES

DISEASE	AGENT V=Virus B=Bacteria R=Rickettsia H=Helminth P=Protozoa	TRANSMISSION	INCUBATION PERIOD	ISOLATION	CONTROL	TREATMENT (When there is a drug of choice it is indicated by a "1"
ADENOVIRUS INFECTION	V	Droplets, contact	2-10 days	None	Immunization.	Symptomatic.
AMEBIC DYSENTERY	P	Feces, water, food, flies.	days-months	None	Carrier control food, sanitation, water.	Tetracycline or Chloroquin and Tetracycline and emetine (recommended for secure or longstanding cases).
ANCYLOSTOMIASIS (hookworm disease)	H	Soil, skin contact.	2-10 wks	None	Sanitary disposal of feces wearing of shoes.	See appendix.
ANTHRAX	B	Contact, inhalation, ingestion of contaminated animal tissue.	1-4 days	Of lesions	Sterilization of animal tissue, hides, bristles, etc.	Penicillin. Alt: Erythromycin, tetracycline. (1)
ASCARIASIS	H	Feces to mouth	2 mos	None	Sanitation disposal of feces.	See appendix.

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DISEASE	AGENT	TRANSMISSION	INCUBATION	ISOLATION	CONTROL	TREATMENT
BRUCELLOSIS	B	Contact with infected animal ingestion of milk, etc.	6-60 days	None	Eradication of disease in animals. Pasteurization.	Tetracycline and Streptomycin. Alt: Chloramphenicol and Streptomycin. (1)
CHANCROID	B	Sexual contact	1-10 days	Modified.	Prevention of exposure.	Tetracycline. Alt: Sulfonamide, Chloramphenicol.
CHICKENPOX	V	Respiratory droplets.	2-3 wks	10 days after exposure until 1 wk after vesicles appear.	Isolation.	Symptomatic.
CHOLERA	B	Feces, vomitus, water, food, flies.	hrs to 5 days	Absolute.	Sanitation, hygiene, vaccination.	Fluid replacement and symptomatic, antibiotic-tetracycline, 3-5 days.
DENGUE	V	Bite of Aedes-aegypti mosquito	3-15 days (usually 3-7 days).	Screens until afebrile.	Mosquito abatement.	Symptomatic (analgesics and sedatives).
DIPTHERIA	B	Respiratory droplets from cases and corners.	2-5 days.	Strict until repeated culture neg.	Active immunization.	Penicillin and Antitoxin, Alt: erythromycin, cephalothin.

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DISEASE	AGENT	TRANSMISSION	INCUBATION	ISOLATION	CONTROL	TREATMENT
DYSENTERY AMEBIC		See "Amebic Dysentery"				
DYSENTERY BACILLARY	B	Infected feces, water, food, flies.	1-7 days	Strict until cultures neg.	Breaking transmission, chain Chemotherapy.	Ampicillin. Alt: Tetracycline, sulfonamides, cephalothin, or Chloramphenicol. (1)
FILARIASIS	H	Bite of infected arthropods.	1 mo-yrs	Impractical.	Control of vectors.	Hetrazan. (1)
GERMAN MEASLES	V	Respiratory droplets.	14-21 days	Exclude from school 10 days after exposure.	Exposure of girls before child bearing age.	Symptomatic. Gamma Globulin immediately after exposure if patient is pregnant.
GONORRHEA	B	Contact of mucus membrane with infected pus.	1-8 days	Modified.	Sex hygiene, treatment of cases.	Penicillin. Alt: Erythromycin, Cephalothin, tetracycline. (1)
GRANULOMA INGUINALE	B	Sexual contact.	8-12 wks	Modified.	Sex hygiene.	Tetracycline, Alt: Chloramphenicol, Streptomycin. (1)
HEPATITIS, INFECTIOUS	V	Fecal contamination. Contact? Water? Shellfish?	15-35 days	Stool isolation.		Symptomatic, high protein diet and rest.
HEPATITIS, SERUM	V	Blood or blood product transfusion, contaminated syringes, needles.	2-6 mos or longer.	None.	Disposable syringes and needles. Careful selection of blood donors.	Symptomatic. High protein diet. Rest.

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DISEASE	AGENT	TRANSMISSION	INCUBATION	ISOLATION	CONTROL	TREATMENT
INFLUENZA	V	Respiratory contact.	1-4 days	During acute illness.	Isolation vaccine.	Symptomatic.
LEPROSY	B	Personal contact.	Years	Modified.	Treatment of cases.	Requires years-evacuate.
LYMPHOGRANULOMA VEREREUM	V	Venereal contact.	1-6 wks	Modified.	Treatment of cases.	Tetracycline (1), Chloramphenicol.
MALARIA	P	Bite of female Anopheles mosquito.	Variable	Screens.	Mosquito control, personal protective measures. Chemoprophylaxis.	1st Chloroquin phosphate 1gm initially, 0.5gm six hours later, then 0.5gm daily x 2 days. 2d choice or if patient is gravely ill, use quinine 1gm t.i.d. for 2 days, then 0.65gm t.i.d. x 6 days. If drug resistance occurs, falciparum form is suspected. Then treat with: (1) Quinine as above except continue for 12 days. (2) Pyrimethamine 25mg 8 hours for first 3 days. (3) Dapsone (DDS) 25mg daily from 7th to 28th. day of therapy.

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DISEASE	AGENT	TRANSMISSION	INCUBATION	ISOLATION	CONTROL	TREATMENT
MEASLES (RUBEOLA)	V	Respiratory droplet or contact.	10-15 days	From 7 days after exposure to 5 days after rash starts.	Vaccination, isolation.	Symptomatic.
MENINGITIS MENINGOCOCCIC	B	Respiratory droplet or contact.	2-10 days	Strict.	Avoidance of over-crowding and fatigue.	Penicillin (1), Alt: Ampicillin cephalothin, erythromycin.
MUMPS	V	Respiratory droplet or contact.	18-21 days	Modified.	Isolation, vaccination.	Symptomatic.
PARATYPHOID FEVERS	B	Water, food, flies excrement.	1-14 days	Strict.	Sanitation, immunization.	Ampicillin (1), Alt: cephalothin, chloramphenicol.
PERTUSSIS (WHOOPING COUGH)	B	Respiratory contact, droplets.	5-10 days	Modified.	Immunization only in early life.	Ampicillin (1), Alt: tetracycline.
PLAGUE	B	Infected rodents, fleas, sputum, discharge from lesions.	2-10 days	Strict.	Rodent and flea control.	Streptomycin (1), Alt: tetracycline, Chloramphenicol.
RICKETTSIAL DISEASES:	R	Mites, ticks	3-7 days	Screen.	Proper wearing of uniform, insecticide, and insecticide impregnated uniform.	Tetracycline (1), Alt: Chloramphenicol.
ROCKY MOUNTAIN SPOTTED FEVER			?			
ENDEMIC TYPHUS			?			
Q FEVER			8-28 days			
EPIDEMIC TYPHUS			8-12 days			
SCRUB TYPHUS			10-12 days			

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DISEASE	AGENT	TRANSMISSION	INCUBATION	ISOLATION	CONTROL	TREATMENT
SMALLPOX	V	Respiratory droplet or contact with lesions.	7-16 days usually 12	Absolute until all scabs are off.	Vaccination, case isolation.	Gentle cleaning of skin. Symptomatic. Pencillin to control secondary invaders. Hyperimmune serum.
STREPTOCOCCAL INFECTIONS	B	Respiratory droplets.	1-5 days	None.	Treatment of cases.	Penicillin 1.2 mil units/ day for 10 days. Alt: Erythromycin, Cephalothin.
SYPHILIS	B	Venereal, transfusion, trans-placentae	1-6 wks (usually 3 wks)	Modified.	Case finding, treatment of cases.	Penicillin (1). Alt: Erythromycin. Tetracycline.
TRACHOMA	V	Contact with infectious discharges of eyes and nose.	?	Modified.	Hygiene, treatment of cases.	Topical (ophthalmic) (1) Tetracycline and oral Sulfanamides.
TUBERCULOSIS	B	Discharge from lesions, infected cowsmilk. Respiratory droplets.	Variable	Strict.	Case finding, treatment.	Isoniazid plus PAS and Streptomycin.(1). Cycloserine, Viomycin, Ethionamide.
TYPHOID	B	Water, food, contaminated with excreta of infected man.	10-14 days	Strict until 2 successive neg stool cultures.	Sanitation, immunization.	Chloramphenicol (1). Alt: Ampicillin, Cephalothin.
YELLOW FEVER	V	Mosquito bites.	3-6 days	Modified	Immunization, mosquito control.	Symptomatic.

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DISEASE	AGENT	TRANSMISSION	INCUBATION	ISOLATION	CONTROL	TREATMENT
YAWS	B	Contact with infected lesions fomites, flies	1-3 mos	Modified.	Prevention of contact. Insect control.	Penicillin (1). Alt: Erythromycin, tetracycline.

1. If concomitant roundworm infestation (ascariasis) exists or is strongly suspected, the patient should be treated with piperazine for roundworms before regular hookworm therapy is begun.

APPENDIX 29

ANTIHELMENTHICS OF CHOICE

I. Drugs for Roundworm Infections

Infecting Organism	Drug of Choice and Dose	Alternative Drug & Dose
Ascaris lumbrocoides	Piperazine citrate; single dose of 1-3.5gm, depending on body wt, daily for two days.	Thiabendazole; 20-25mg/kg bid for one or two days.
Trichuris trichiura (whipworm)	Hexlresorcinol (0.2% solution); 500ml by rectal retention for one hour.	Thiabendazole; 20-25mg/kg bid for one or two days.
Ancylostoma duodenale (hookworm)	Bephenium; 50mg/kg bid for one day, repeat in a few days if necessary.	Tetrachlorethylene[2]; single dose of 0.12ml/kg in gelatin capsules.
Necator americanus (hookworm)	Tetrachlorethylene[2]; single dose of 0.12ml/kg in gelatin capsules.	Bephenium 5mg/kg bid for 3 days.
Cutaneous Larva Migrans (Hookworm)	Thiabendazole; 20-25mg/kg bid for 2 days; repeat after interval of 2 days if necessary.	
Strongyloides stercoralis (Threadworm)	Thiabendazole 20-25mg/kg bid for one to two days.	Pyrvinium pamoate[3]; 50mg tid for 7 days.
Enterobius (Oxyuris) vermicularis (pinworm)	Pyrvinium pamoate[3] single dose for 5mg/kg.	Thiabendazole 20-25mg/kg bid for one day; repeat after 7 days.
Trichinella spiralis (Trichinosis)	Thiabendazole 20-25mg/kg bid for 2-4 days.	None.

II. Filariae

Infecting Organism	Drug of Choice and Dose	Alternative Drug & Dose
Wucheraria bancrofti	Diethylcarbamazine 2mg/kg t.i.d. for 7 days.	
Onchocera volvulus	Diethlcarbamazine 2mg/kg t.i.d. for 21 days.	

III. Tapeworms

Taenia saginata	Quinacrine: Four doses of 200mg each given 10 min. apart. Sodium bicarbonate should be given with each dose.	Aspidium oledresin 5.0gm for adults; for children 0.3gm per yr of age.
Taenia Solium	Same as Taenia saginata.	
Diphllobothrium Latum	Same as Taenia saginata.	
Hymenolepis nana	Same as Taenia saginata.	

IV. Flukes

Schistosoma haematobium Schistosoma mansoni (Blood flukes)	Stibophen, 5ml q 2-3d IM until a total of 4ml has been given.	
Schistosoma japonicum	Tartar emetic, 8mg of 0.5% solution IV increase dose 4ml q2d until total single dose of 28ml is given.	
Paragonimus westermani (Lung Fluke)	Emetine Hydrochloride; 1mg/kg subcutaneously daily for 10-12 days.	

SIDE EFFECTS OF ANTIHELMENTHICS

1. Piperazine citrate occasionally causes dizziness, visual disturbances and other evidence of neurotoxicity.

2. Tetrachloroethylene often causes inebriation and rarely, loss of consciousness. The patient should be kept at rest for four hours after the drug is administered. No alcohol should be taken before or for 24 hours after the drug.

3. Pyrvinium pamoate may cause nausea and vomiting; it turns the stool red.

INTESTINAL AMOEBAE OF MAN

Endamoeba histolytica



Trophozoite



Mature Cyst

Endamoeba coli



Trophozoite

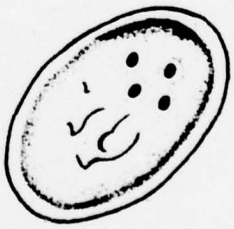


Mature Cyst

Endolimax nana



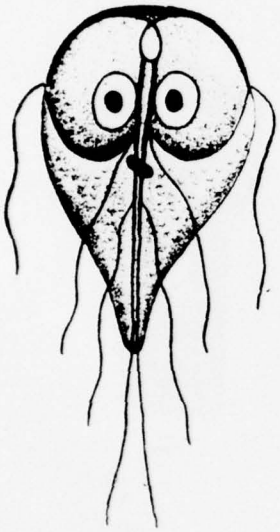
Trophozoite



Mature Cyst

INTESTINAL AND VAGINAL FLAGELLATES AND CILIATES OF MAN

Giardia lamblia

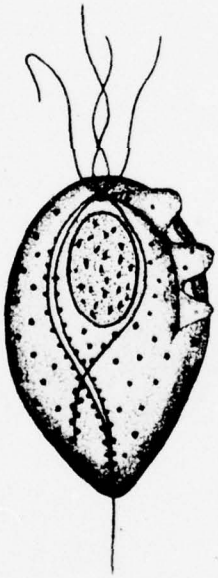


Trophozoite



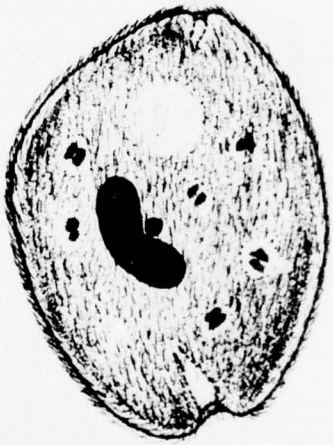
Cyst

Trichomonas vaginalis

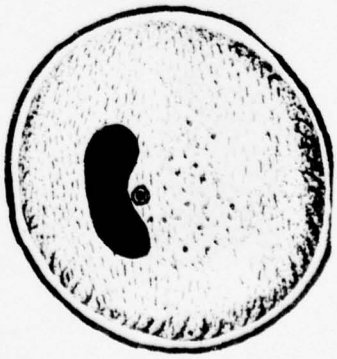


Trophozoite

Balantidium coli



Trophozoite



Cyst

CESTODES OF MAN (Tapeworms)

Taenia saginata



Head



Proglottid



Egg

Taenia solium



Head

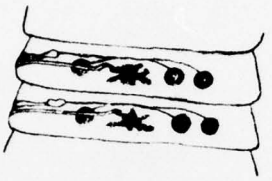


Egg

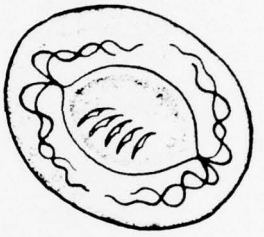
Hymenolepis nana



Head



Proglottid



Egg

TREMATODES (flukes)

Schistosoma haematobium



Egg

Schistosoma japonicum



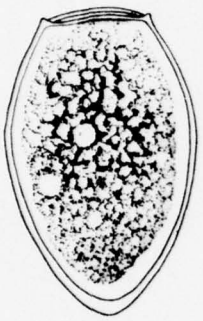
Egg

Schistosoma mansoni



Egg

Paragonimus westermani



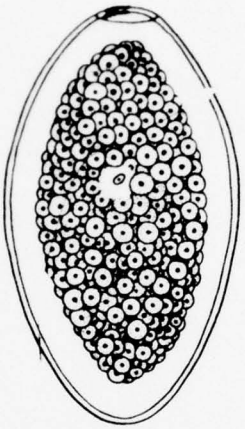
Egg

Clonorchis sinensis



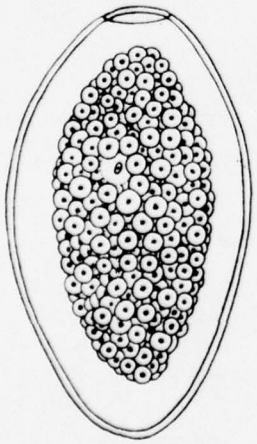
Egg

Fasciolopsis buski



Egg

Fasciola hepatica



Egg

Metagonimus yokogawai



Egg

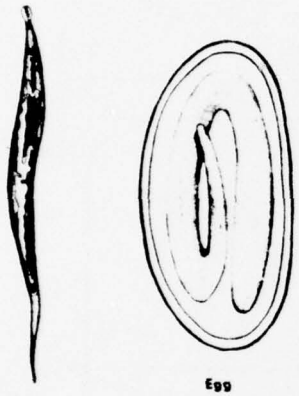
Heterophyes heterophyes



Egg

NEMATODES (roundworms)

Enterobius vermicularis (pin-worm)



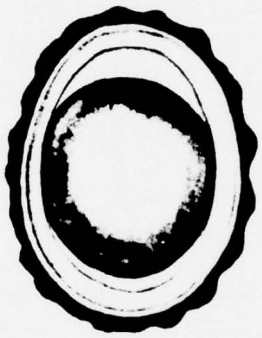
Adult Female

Egg

Ascaris lumbricoides
(large roundworm of man)

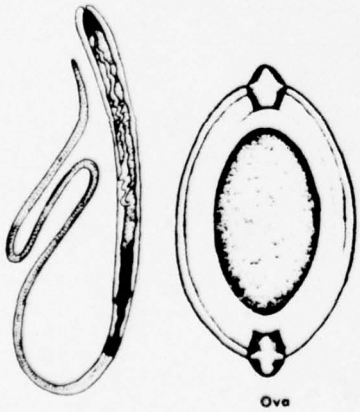


Adult Female



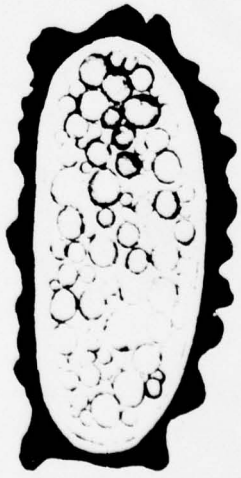
Normal Corticated Fertilized Ova

Trichuris trichiura (whip-worm)

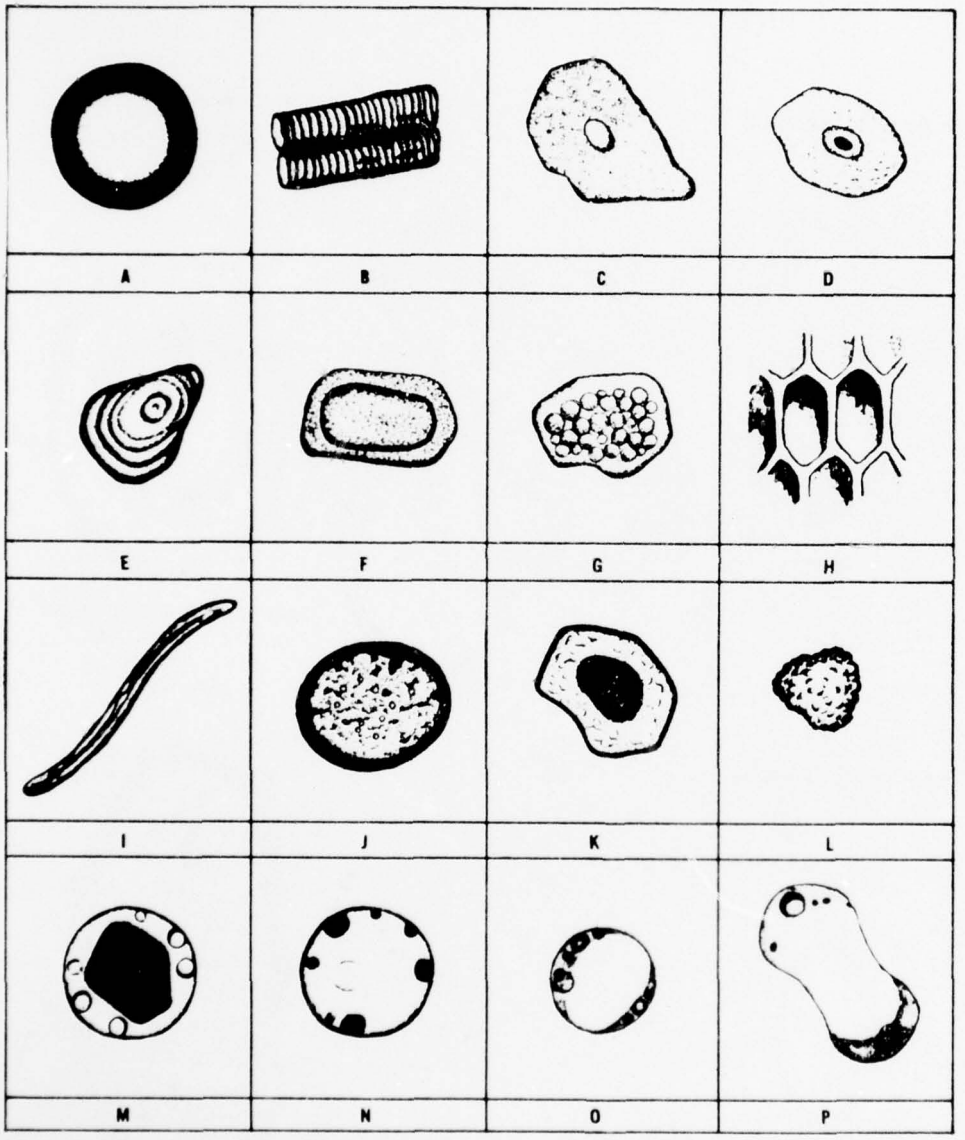


Adult Female

Ova



Corticated Unfertilized Ova



Pseudoparasites and Artifacts Commonly Mistaken for Intestinal Parasites.

A, oil glubule, B, partially digested muscle fiber, C and D, epithelial cells, E thru H, vegetable cells, I, plant hair, J thru L, pollen grains, M thru P, Blastocystis sp.

Necator americanus Ancylostoma duodenale (hookworms)



Head, Necator americanus

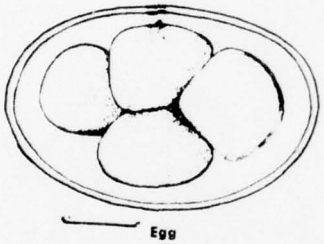


Head, Ancylostoma duodenale

Strongyloides stercoralis

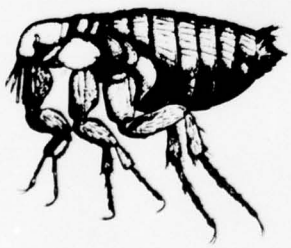


Larva



Egg

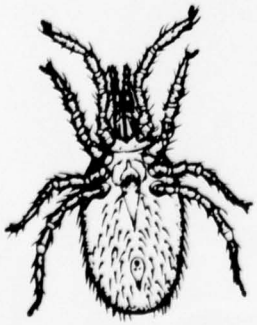
IMPORTANT ARTHROPOD VECTORS OF DISEASE



FLEA

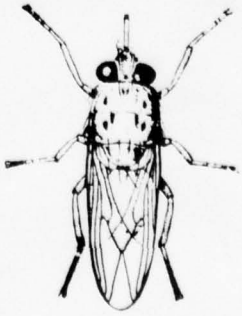
LOUSE





MITE

TSETSE FLY



Necator americanus Ancylostoma duodenale (hookworms)



Head, Necator americanus

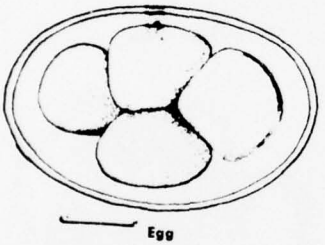


Head, Ancylostoma duodenale

Strongyloides stercoralis

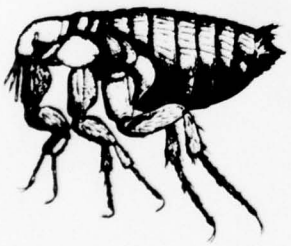


Larva



Egg

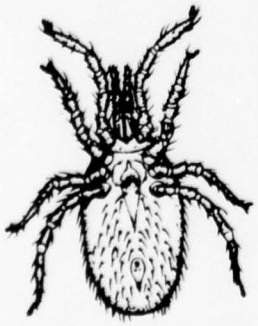
IMPORTANT ARTHROPOD VECTORS OF DISEASE



FLEA

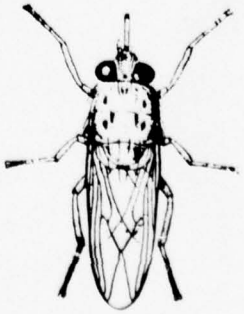
LOUSE





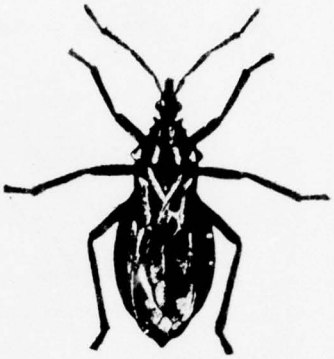
MITE

TSETSE FLY





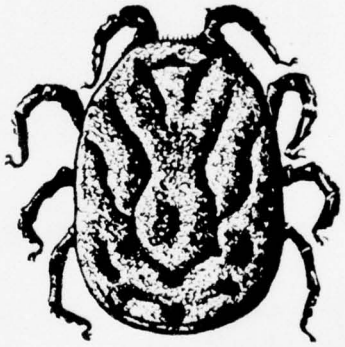
SANDFLY



ASSASSIN BUG



HARD TICK



SOFT TICK

VENOMOUS ARTHROPODS



CENTIPEDE



BLACK WIDOW SPIDER

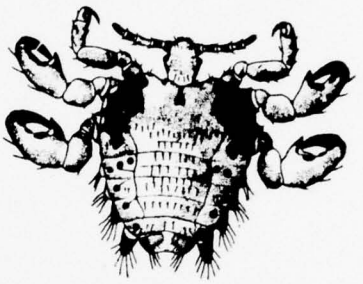


SCORPION

TRUE ECTOPARASITES



BEDBUG



PUBIC LOUSE



ITCH MITE

APPENDIX 30

ISOLATION TECHNIQUES

REC = Recommended NEC = Necessary PERMIS = Permissable ESS = Essential

Group I	Room	Cubicle	Open Ward	Mask	Gown	Hand Washing	Stool Precautions
Chickenpox	REC	PERMIS	NOT REC	NOT REC	ESS	ESS	NOT NEC
Diptheria	"	-	"	"	"	"	"
Encephalitis (viral)	"	-	"	"	"	"	"
Epidemic diarrhea of newborn	"	-	"	"	"	"	ESS
German measles	"	-	"	"	"	"	NOT NEC
[1]Infectious hepatitis	"	-	"	"	"	"	ESS
Measles	"	-	"	"	"	"	NOT NEC
Meningitis (all forms)	"	PERMIS	"	"	"	"	"
Pertussis	"	-	"	"	"	"	"
Pneumonias	"	-	"	"	"	"	"
[2]Poliomyelitis	"	PERMIS	"	"	"	"	ESS
Smallpox	"	-	"	NECES	"	"	NOT NEC
Staph Infections	"	-	"	"	"	"	"
Strep Infections (including scarlet fever, sore throat, erysipelas, puerperal fever)	"	-	"	"	"	"	"

Group I	Room	Cubicle	Open Ward	Mask	Gown	Hand Washing	Stool Precautions
TB, Primary	REC	PERMIS	NOT REC	NECES	ESS	ESS	NOT NEC
Plague	"	-	"	"	"	"	"

* Hand Washing: If possible use hexachlorophene or phisohex soap. Wash with heavy lather, rinse and rewash. Total time: 90 seconds.

APPENDIX 31

SURVIVAL KIT CONTENTS

I. Introduction. Personnel deployed to remote areas are supplied with survival kits. The kit supplied may be of two standard types: for hot-dry climates and for hot-wet climates. Each "kit" is actually two "packets". One is an operational packet and the other is the reserve packet.

II. Operational Packet. Each operational packet, FSN 6645-782-2822, contains items to be used to maintain health and well-being. Included are: salt tablets, anti-malaria tablets, antibiotics, diarrhea medicine, water purification tablets, insect repellent, fungicidal ointment, antiseptics, and bandages. There are also a flexible saw, a signal mirror, and a flare gun for emergency use. The medical items are standardized and most may be replenished at medical facilities.

III. Reserve Packet. The second packet is a "reserve" packet, FSN 6545-785-2823, and contains: additional antibiotics and medical supplies, a compass, a butane firestarter, a fishing kit, a razor knife, a mosquito headnet, a sewing kit, and information to assist in the use of the packet contents.

APPENDIX 32

SNAKEBITE TREATMENT GUIDE

I. GENERAL. Poisonous snakes of one type or another are found in most parts of the world. The species found varies in different geographical areas. The medic should familiarize himself with the kinds found in the area where he is working. One of the first concerns in treating snakebite is to obtain proper identification of the kind of snake. Treatment with antivenom involves a certain amount of risk and should not be given if the bite was from a non-poisonous snake. About one-third of the time a poisonous snake strikes it does not inject venom. Treatment is not necessary in these cases. The presence of fang marks and the development of pain, redness, and edema are indications that venom has been injected.

II. TREATMENT.

A. Immobilize the Bitten Area and Keep the Patient as Quiet as Possible. Do not let him walk or run. Do not give stimulants such as alcohol.

B. A Loose Constricting Band Should Be Placed Between the Bite and the Heart Until Definitive Therapy Can Be Started. One should be able to easily slip a finger under the band; it should impede lymphatic flow, but must not be so tight that it stops blood flow. It should not alternately be loosened and tightened as this pumps the venom into the system faster. Once other therapy has been started, the constricting band should be removed and left off.

C. If Seen Within the First 30 Minutes a Single Longitudinal Incision About One-Quarter Inch Deep and One-Quarter to One-Half Inch Long Should Be Made Over Each Fang Mark and Suction Applied. Crossed incisions or multiple incisions should not be used. If more than 30 minutes have passed since the bite, the value of incision and suction is of no value and should not be used. Sterile technique should be observed as much as possible.

D. Antivenin Is the Most Important Therapy in the Treatment of Snakebite. In North America the polyvalent antivenin made by Wyeth can be used for all but the coral snake. In many other areas of the world, specific antivenins are available for the snakes in the area. If the snake is a pit viper of any kind, the polyvalent antivenin will probably be of benefit. Antivenins are all made from horse serum. Since some people are highly allergic to

horse serum, a skin test should be done before administering the antivenin. The skin test is performed as follows: inject intracutaneously (as with PPD skin test) 0.02cc of Normal Horse Serum or Antiserum, raising a small wheal. A control test with normal saline should be done nearby to make judging the results easier. A positive reaction occurs within 5 to 30 minutes and is manifested by a wheal and surrounding redness. In general, the shorter the reaction time to the test, the greater the degree of hypersensitivity. Note: An extremely sensitive individual may suffer a severe or even fatal reaction from the test dose alone. If the skin test indicates that the person is allergic to horse serum, desensitization should be carried out by the directions given in the antivenin kit. The total dose of antivenin given may be from one to five or even ten vials depending on the severity of symptoms. Children, in general, require more antivenin than adults. The antivenin is normally given intramuscularly, but particularly in severe cases may be diluted in 250cc normal saline and given intravenously. Local infiltration of antivenin in the area of the bite should not be done.

E. Antibiotics Should Be Given Because the Puncture Wounds From the Fangs Are Often Highly Contaminated by Bacteria From the Snakes Mouth. Broad spectrum antibiotics are preferred (tetracycline, ampicillin, etc.).

F. Persons Being Treated For Snakebite Should Be Given a Booster Dose of Tetanus Toxoid. If they are previously unimmunized for tetanus it will be necessary to use tetanus antitoxin.

G. The Bite of a Poisonous Snake is Very Painful Requiring the Judicious Use of Analgesics. Intravenous administration of whole blood, Dextran, or saline solution may be required to combat shock. Vasopressors such as aramine may be necessary to maintain blood pressure.

H. The Desensitization Technique is Important Enough to Cover in Detail. Prepare in separate sterile vials 1:100 and 1:10 dilutions (in normal saline) of antiserum. Inject subcutaneously using a tuberculin type syring 0.1, 0.2 and 0.5cc of the 1:100 dilution at 15 minute intervals. Repeat with 1:10 dilution, and finally the undiluted serum. If no reaction occurs after the 0.5cc of the undiluted serum has been administered, continue doubling the dose at 15 minute intervals until the entire dose has been injected.

APPENDIX 33

PRIMITIVE MEDICINE IN A SURVIVAL SITUATION

I. OBJECTIVE: To provide the shortest possible course on Primitive Medicine in a Survival Situation.

II. INTRODUCTION: This article is based upon Dr. Lam's personal experiences and first-hand observations in Korea. Major Gene M. Lam, United States Army doctor, is very often quoted in survival training school lectures.

You may not remember the greater portion of this article half an hour after you read it, but, if you are on the ground behind enemy lines or even in a desolate area of friendly territory, some of this will come back to you. If it helps save the life of even one man, then this article will have been well worth the effort on our part to reproduce it for dissemination to the aircrews assigned to this wing.

"You must learn basic first aid - what to do for fractures, cuts, burns, etc. If you go down, you are supposed to have all kinds of things with you - a survival kit, a first aid kit, and printed instructions about using them. Let's assume, however, that you land with only the clothes on your back - it happened just that way to lots of men in Korea. You then must know how to get along with what you have; to make do.

God gave you two important things - your head and your hands. If you think and intelligently use what you have, you can take care of yourself.

That's why I believe everyone should be taught to survive under the worst possible circumstances. Then if he is in a less strenuous situation, he can get along well; if he has aids for survival, they're so much gravy.

III. SURVIVAL FIRST AID. When you learn first aid and study survival medicine, you must assume that there will be no one but you to practice it. In survival and evasion there probably will not be anyone else except perhaps men from your own crew. All six doctors captured with me were put in one PW camp, but few USAF doctors are apt to be captured and you may be in a camp of only Air Force prisoners. You may not have a trained medical corpsman - you should not expect to have one.

When most of these observations were made, there were five doctors in the camp with me. Thanks to all of them - including the three who later died - I can tell you these things, not as my own isolated findings, but as our group opinions.

Immunization helps, don't avoid shots. You can save your life by keeping your immunization record up to date. No man died in Korea of any disease for which the armed services gave immunization shots.

IV. NOT ADVANCED SCIENCE - BASIC PRINCIPLES. All of us - patients and doctors alike - depend today upon the wonder drugs, fine laboratories, modern medical equipment. We have too easily lost sight of the "country doctor" type of medicine, of the things men always have that can save them - determination, common sense, and a few primitive techniques. Some of these remedies were practiced by the Greeks, Romans and Arabs long before the birth of Christ. They are still good today when no other means are available. It's amazing, but man can and does live without penicillin for every ache or pain.

V. REGARDLESS OF WHAT IT IS - EAT IT. One basic principle of survival medicine is to eat. After you have been down a few hours, you get hungry. If you can, find something edible and eat it. If you are captured, someone soon will bring in a bucket of slop and, after your stomach has flipped from the sight and the smell of it, you may say: "I can't (or won't) eat that stuff."

You'd better eat it because that's all you'll get and it may get progressively fouler and skimpier. Here "will" comes in. Say to yourself, I'll eat everything they give me and the nourishment will help me to get through." You must eat everything you can get - issued rations, things you can steal, things you procure from the environment.

We ate dogs, cats, rats, weeds, maggots. For a while we got only ground field corn, boiled for half an hour. It is tasteless, but it will keep you alive. In fact, we were living it up when we got that corn mash.

Most PWs in Korea ate dog but it was hard to do. Dogs are a delicacy in that area and we weren't issued luxury items, but once in a while a stray could be shanghaied. The town we were in had a stray cat. Pussy didn't wander long. It was quite delicious, rather like squirrel.

It helps not to be able to identify a strange dish the first time it's served but after the first time, the ingredients don't really bother.

It was difficult to down rats but they were edible. I strongly recommend cooking them because raw they can carry several diseases.

Snakes, of course, are eaten the world over and some varieties are delicious. Just chop off the head, skin the rest, cook, then eat what's left. Even poisonous varieties are edible.

Maggots are something else. Once we were issued rotten fish loaded with maggots. Our English cook protested and wanted to scrape them off. Afraid that some of the fish would be lost, I insisted that he cook fish, maggots and all. We ate the results, which were really quite good.

In May 1951, every PW in camp was swollen like a balloon from severe beriberi. Since spring weeds were beginning to appear, we figured we could boil them as a cure but there wasn't a weed in camp. However, some of us were taken almost daily to a river for wood and other supplies. The criterion for success soon became not how much wood but how many weeds we could bring back. We didn't know what kinds of weeds they were, but we picked them, boiled them and ate them. Our beriberi disappeared.

You will be revolted by food given you as a PW, but if you miss one meal as a prisoner, it will take you weeks to regain your lost strength. You can't afford to miss a single bite when you are on a bare subsistence diet. If you're going to live, <u>eat</u>. If you plan to escape, you must have the strength to do it.

VI. YOUR RETURN TICKET - YOUR OWN FEET. Your two feet are the other half of the round-trip ticket. The importance of caring for your feet cannot be overemphasized. Men walked barefoot for miles over snow and ice when the Korean weather was 45 to 50 degrees below zero. Those who took proper precautions got neither trench feet nor frozen feet.

The precautions are simple. If you have shoes and socks, periodically take them off and rub your feet for five or ten minutes. You won't get frostbite.

If you have two pairs of socks, put one pair next to you skin to keep it dry. Change to the dry pair at least once a day. When you bed down at night, take your shoes off. Any man who gets frostbite is guilty of neglect amounting to misconduct.

In order to land safely after bailout, to walk and protect your feet, you must have proper boots. Those men who landed in North Korea with lowcuts will back me up on this.

Incidentally, if you remove the steel arch support that is in most boots, and sharpen it on a rock, you will have an excellent surgical knife.

VII. DYSENTERY. Dysentery becomes a problem in enemy territory to most men - be they evaders or prisoners of war. The risk of dysentery can be greatly lessened if you have and properly use halazone tablets or iodine, or if you boil water. But there will be times when you cannot possibly take such precautions. Also, men have gotten dysentery from nothing more than just being scared.

What is dysentery? In our camp we set up an arbitrary standard: 25 stools per day. Eight to ten was normal and 15 was merely simple diarrhea.

What can you do about dysentery? You will lose water which you must replace. If possible, replace it with boiled water, but at any cost drink quantities of liquids. You must also eat, even if that means choking down food.

Charcoal can help. Take any partially burned piece of wood, scrape off the charred portions and swallow them. How much? Oh, about a handful.

Bones - any kind of bones - can help. They are best if burned and ground into ash, but you can grind bones between rocks to a powder. Just swallow the powder.

The Communists, anxious to "educate" every prisoner of war, usually have lots of chalk around for writing on the "wonders" of Bolshevism. Steal some ordinary schoolroom chalk, powder it and swallow it. It, too, will help cure dysentery.

Pull bark from trees, preferably oak trees, but any kind will do. Boil it from twelve hours to three days. As the water evaporates, add more. The resulting brew will be so black, so vile tasting and so evil smelling, that it will choke you. But boiled bark contains tannic acid and that will help to cure your dysentery. It also can help further the healing of burns. Boiled bark is so terrible to choke down that we were never really sure whether people willed their dysentery to quit rather than swallow the medicine. We joked that the cure was worse than the disease - but it was a cure. (I remembered this remedy because my grandfather had used tree bark to cure deer hides and I figured that something with enough tannic acid to cure hides probably contained enough to cure dysentery.)

Tea is another dysentery cure because it, too, contains tannic acid. Men who'd had chronic dysentery for two or three years were cured when we got enough tea. Strong tea solutions which contain tannic acid in concentration have also been used for centuries for burns.

VIII. HEPATITIS. In the summer of 1951, when the Communists talked mildly about bacteriological warfare, we laughed it off as impossible. We still joked about it when they innoculated us against this ridiculous "threat". There was a bottle of Soviet-made serum, one syringe and one dull needle for 110 PWs. The first man in line had hepatitis. Within a week 35 others had it.

Hepatitis, or yellow jaundice, is a liver disease. When you have it, you don't want to eat but you must. We force-fed men to keep them alive - pushing rice or anything else available down their protesting throats. We also tried to keep them off duty as much as possible for about six weeks after the jaundice had subsided.

The loss of appetite from this disease is terrible. I know because I had hepatitis twice. The other doctors kept me alive by force-feeding me. At the time it was rugged and I hated them for it - but today, needless to say, I am grateful.

IX. LICE. As a prisoner of war you will get to know many representatives of the animal kingdom, among them the louse. This six-legged insect can kill you. There are some 5600cc's of blood in the body of a normal man of average size. A single louse sucks one cc of blood a day. A louse-covered man soon dies.

In Korea no PW died of any louse-borne disease. I credit this to immunization. Do keep your shots up to date. However, lice can bleed you to death unless you pick them off every single day. Never fail to do this even though you are cold, tired and sick, whether you are a PW or evader.

One PW complained of being weak and tired. In our makeshift hospital, next to the equally makeshift morgue, I unbuttoned his jacket and shirt and pulled up his undershirt. He was a mass of moving grey bodies. Lice were so thick I could not see his skin. That man was literally being bled to death.

You must pick lice off frequently, for they breed faster than rabbits. Regardless of how cold it is, you must inspect your entire body and every seam of every garment at least once a day, picking off every single louse. Louse hunting does more than just keep the bug from killing you. It not only provides diversion and entertainment of a sort, it also keeps you busy. Purposeful occupation is important beyond measure if you are an evader or a PW.

X. WORMS. You will get worms - all kinds, round, hook and plate worms. They will come from the food you eat and the dirt and filth where you live. Some will look exactly like angle worms five times enlarged. Although there are other symptoms, positive proof that you are infected is when a worm crawls out of your nose. That undoubtedly will shake you up a bit. It always does.

Personal hygiene is the best preventive measure against parasitic infestation. You may not be really clean from the day you go down until you get out, but there are things you must try to do. Wash your body and clothes as often and as well as you can. And above all, pick lice off at least daily.

Depending upon supplies, there is a worm remedy: Swallow a couple of tablespoons of kerosene or gasoline. Kerosene is more effective but gasoline will do. Either will make you a bit sick, but will make the worms a lot sicker.

XI. PNEUMONIA. You will encounter diseases and your resistance to them will be low. Pneumonia is probably the most common, especially in winter and it makes you extremely sick. You will have no penicillin, no tetramycin, not even old-fashioned sulfa. (In Korea, I had 250 sulfanilamide tablets for more than 2000 men.)

When a man has pneumonia in primitive circumstances, there is only one thing you can do for him, even though it is not in any medical book - keep him on his feet. You should not keep a sick man on his feet 24 hours a day but don't let him lie in a corner, pull something over his head, and roll over to face the wall. If he does this, he will die. You must keep him alert and interested, or he will not live.

Some men with severe cases of pneumonia lived because of this treatment and their own will. Others with bad colds got frightened, laid down, gave up, and died within 24 hours.

XII. BLEEDING. Here I want to make a plea: If you are bleeding, DO NOT put on a tourniquet. I believe more men lost arms and legs as a result of tourniquets than from any one type of war wound. A tourniquet destroys tissue, gangrene sets in, and it is often impossible to save the injured member.

Just apply heavy, constant pressure - that alone will stop 90% of all bleeding. If blood is spurting out, stick your finger down on the wound and hold it there.

XIII. BURNS. Suppose you are burned. The book says to wash out the burned area and to cover it with a sterile dressing. What, you ask, can you wash it with when there is no water or none that can pass in the dark as sterile? Well, every man has his own supply of one of the most sterile liquids you can find - his own urine. This is just one of the small bits of knowledge you may be able to put to good use. Trying it under extreme circumstances will not hurt you and may save your life.

As you read earlier, tannic acid is good for burns, as well as dysentery. There is tannic acid in strong boiled bark and tea solutions.

XIV. THE WATER CURE. Hot water probably saved the lives of more prisoners of war in Korea than any other measure or remedy. We used hot water to treat men with everything from headaches to athlete's foot.

For awhile men came in and gave us long lists of symptoms, before asking, "what do you suggest?" Our prescription was usually, "Go soak it in hot water". After awhile they began to say, "Doc, I've got thus and so. Now I know you're going to tell me to go soak it in hot water, but I just want you to know about it anyway."

Maybe hot water didn't help in every case, but soaking kept the patient busy doing something that seemed reasonable and purposeful. A man who sits for two or three hours soaking a toe or hand, usually doesn't dwell on his unfortunate situation. He's too busy thinking about the cure he's effecting, or how much better his toe or hand feels. (For stomach aches, we might use a variation: Heat a brick and put it on your tummy.)

XV. WOUNDS AND SURGERY. There are three treatments for a wound under extreme conditions: Clean it out if possible with hot water; wash it out with urine; and/or pick out all foreign matter. The book says never to stick your fingers in a wound. If you have nothing else and if there are pieces of metal or bits of clothing in the wound, pick or dig them out with your finger.

Maggots were an accepted treatment for infected wounds during World War I. Maggots eat only dead tissue and will clean out a wound better than anything else except surgery. How, you ask, do I get hold of maggots? That's easy if you are anywhere in Asia - just expose the wound, the maggots will find it.

If surgery of any kind is required, remember that the area of the wound is dead. When you realize there is no feeling in a wound, it is easier for you to stick a needle into it, to cut, or to do whatever is necessary. (We had to amputate a few toes as a result of frostbite. For the first six months we had a little ether, but later there was no anesthetic.)

You may never have to use a knife to lance boils, cysts and the like; but if you do, soak the area in hot water for a couple of days and then, if it is still necessary, open it up.

A most successful hemorrhoidectomy was performed in our camp. A Major had a terrible hemorrhoid that bothered him dreadfully. He limped about for days, soaking it in hot water as often as possible. When the condition failed to improve, he came to me. As he bent over for me to examine him, four trusty colleagues grabbed him. I whipped out my trusty surgical knife, patiently sharpened to a razor's edge on stones but originally a steel arch support from a boot. Out came the offending hemorrhoid despite the patient's belligerent screams and profane threats. The operation was extremely successful. The patient not only lived, he lived in considerably greater comfort.

XVI. MEDICAL SUMMARY. You of course, know all the basic first aid the Air Force has exposed you to. And, of course, if possible, you will have with you a standard first aid kit, as well as your own special one (having such kits is a real luxury). In addition, you must face the possibility or even the probability that emergency treatments may extend far beyond those normally covered by peacetime, ZI first aid. You must also face the very real probability that you may be the only person available to perform such treatments. Under such circumstances you must use what God gave you - your head and your hands.

Men with chest wounds - open, sucking wounds - have stuffed them with handkerchiefs or torn shirts and kept going. Men have broken their backs when they bailed out or hit the ground. After regaining consciousness, they have rolled around for a stick or board, strapped it to them in a fashion and moved on. Men with severe wounds have amputated a limb, whittled a crutch, and kept going. Many things are possible to those with will and determination.

XVII. THEFT. In a prisoner of war camp you learn not only to scrounge, but also to steal proficiently. When I got back to the States, it took me a long time to learn to keep my hands in my pockets when I walked through dime stores.

Sometimes you steal because an object is useful to you. More often you steal things you know you can't use. We figured that everything cost the Communists money or effort, so that we made additional money or effort necessary when we stole any item. Also, thievery built up our morale.

One enlisted man in our camp was a professional thief who perfected his calling at the Communists' expense. The Chinese camp commander eventually became so enraged that he caliedin our man. When the PW returned, we were curious about what had happened. He explained that he stood stiffly at attention while the commander chewed him at length (and in Chinese) about his thefts. "He was so hot about it, that he impressed me. In fact, I think I ought to take back his watch and pen that I just lifted."

In the camp known as "Death Valley", we stole a complete building. The Communists had let us build a little hospital, had given us two 55 gallon drums for a stove, but wouldn't give us any wood for it. Nearby there was a wooden building, with mud plaster on the outside. Over a period of two weeks, we surreptitiously took board after board from that building until only the thin plaster shell remained. One night we finally knocked that down, removing the last boards and every piece of straw. The Chinese didn't realize the building was gone for two weeks, and by then we had burned the evidence in the hospital stove.

I was called in for questioning as to what had happened to the people's building. I could only reply that there was no such building. When they looked at the place where the building had been, there was only a bare spot. How could they accuse me of stealing a building? It was too ridiculous!

You may occasionally get caught in such thefts, but usually it's worth it. Through such activities you can pay the enemy back for his harassment. Sometimes your thefts may even cause your captors to cease harassing activities. In any event, you have a lot of fun outwitting them.

XVIII. KEEP A SENSE OF HUMOR. Humor is important in a prisoner of war camp. Even though everything around you is tragic, you must laugh to sustain your will to survive. You have to consciously work to retain a sense of humor, a sense of the ridiculous. If the Communists tie you up for some reason, you must be able to find humor in the fact that you can tie better knots than two or three of them are doing.

I actually laughed at men dying. There were symptoms you could assess without being able to describe them: a listlessness, a look, turning from reality. When these symptoms appeared in various degrees and varying combinations, you could estimate very closely how long a particular man you had come to know well would cling to life. Another doctor and I had a running bet on life expectancies. Even though I made money on the deal, I hope never to have to face such a situation again.

We used our sense of humor rather effectively in a perverted sort of counter-harassment. Americans are the most unpredictable people in the world - and methodical types like the Chinese Communists were unstrung when they could not anticipate what we would do next. We encouraged this by deliberately moving along in one direction for awhile and then without warning making a complete 180^{o}.

Such activities seemed to us our little contribution to the war effort, that we had a mission of some sort. Our PW camp was our "front", a small but active area of combat. Although we had no orthodox weapons, we inflicted what damage we could to the enemy we encountered.

Some camps had one guard for every two or three prisoners. Primarily because they couldn't figure us out nor anticipate our actions, we had two guards for every PW. A small contribution to the total war effort? Perhaps, but it gave us a sense of accomplishment and it did tie up a number of Chinese.

It's hard to say which we enjoyed more, our pleasure in a prank for our own sake or the confusion we could create by it. For example, the Commies had a 50-foot pole lying on the ground, ready to be raised as a flag. We stole the pole, sawed it up and burned it. One PW got 30 days solitary for it but, after all, somebody had to be punished and the antic was well worth it.

Right in the midst of the big germ warfare campaign, we caught a rat. The rat acquired a parachute and a USAF tag before being hung on a bush by the front gate. The chief commissar, dainty air-fairy type, found it. He jumped four feet in the air, did three double flips and raced hysterically back to his headquarters. Then the officials came to investigate, and to take pictures for their files of "proof" about bacteriological warfare! We roared with glee, to their complete confusion. That spoof had us laughing for weeks and such laughter kept us alive.

One PW calmly walked up to a guard, socked him in the nose, grabbed his gun, tossed it over the fence into a rice paddy, and just as calmly walked away. It was marvelous because the guard could do nothing without risking punishment himself.

In every group there are characters. Look for them and encourage them to dream up stunts to make the group laugh and to confuse your captors.

XIX. SUMMARY. You chances of survival can be extremely good, even as a prisoner of war, <u>if</u> you do these things:

*Exercise your leadership responsibilities.

*Maintain military and self-discipline.

*Keep up your own and others' morale.

*Recognize and control fear.

*Keep on your feet, keep going.

*Eat everything you can get hold of.

*Nourish your sense of humor.

*Keep your immunizations up to date.

*Practice survival self-aid and preventive medicine, using common sense and your surroundings.

*Keep up your will to survive.

Training such as is given at the USAF Survival Training School helps tremendously. It especially helps you over the first shock of being an evader or a prisoner. You should learn what the possibilities are and face them. You must master the basic fundamentals of hygiene, survival sanitation, first aid, preventive medicine, and survival nutrition, including securing natural foods and the nutritive values of native foods. Training greatly increases your chances of survival.

However, of all the things I've discussed, none is as important as your own will to survive. Regardless of where you are, how miserable your circumstances, what the enemy does to you, MAKE UP YOUR MIND THAT YOU WILL LIVE THROUGH IT. Men who should have been dead, simply refused to die. Their secret? They had this one idea and they kept it despite everything: "I'm going to live!"

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