DON'T BE A SICK MISSIONARY

A GUIDE TO SPRITUAL, MENTAL AND PHYSICAL HEALTH IN THE MISSION FIELD

Introduction

As the interest and participation in short- and long-term medical mission activities has increased over the past several years, so has the need for guidance in making preparations for such activities. Although some very excellent academic training is being offered by various institutions, many medical professionals do not feel that they can take the time to go back to school, especially if theirs is to be a short-term trip. This book has been written with this in mind in an effort to help equip, at least to some degree, such candidates.

Maurice Hood, MD, retired professor of thoracic and cardiovascular surgery at the New York University School of Medicine, has made numerous working trips to West Africa, and is keenly aware of the need for this book. He has witnessed the arrival of a few totally unprepared workers on the field, who, in some cases, did more harm than good. Although Dr. Hood has authored a number of medical textbooks and has contributed chapters and articles to numerous scholarly books and medical journals, he is equally qualified, due to his involvement throughout the years as an elder and spiritual leader, to compile this book, which is of an entirely different nature.

Topics have been selected, which Dr. Hood feels are essential, both for short-term workers and long-term missionaries. He has also selected writers who have, in various ways, qualified themselves to write on their particular topics.

This material is presented in the hopes that some aspiring long-term missionaries, and some who are planning to make periodic short-term medical mission trips will read and profit from it. If only a few blunders are prevented, and if only minimal help is rendered by this material, then the project will have been worthwhile.

As editor and compiler of this book, Dr. Hood hopes that servants of God, following in the footsteps of Jesus, will be somewhat more effective in their service to others. To this end, the book is presented.

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Preface

This presentation is directed to those serving or planning to serve as missionaries in third world countries. While not necessarily limited to Africa, Centra America and the tropical areas of the Pacific, the emphasis will be on the problems common to these areas. The physical and mental health of expatriates who travel to these countries is of critical importance to themselves and their families and also to the work they are engaged in.

Some people, regardless of motivation, are ill-prepared or unsuited to work and live in a poverty stricken area in a culture alien to that which they are accustomed to. Culture shock is a very real entity and can be disabling and destructive if not recognized and dealt with properly.

There are a number of misconceptions that exist about how to live and work in the tropics. Some of these will be discussed in depth.

There are real dangers to missionary personnel if they fail to observe basic rules for the prevention of infectious and parasitical diseases. One has to only look back to the first quarter of the century to see the cost in human life among missionaries who did not have the knowledge of tropical disease that we have today. The author visited the Scottish Presbyterian Manse in Calabar, Nigeria a few years ago. There is a cemetery in the compound containing over 200 graves of missionaries who died there. Many of these died within a few months after their arrival. Among the graves is that of Mary Slessor a legendary nurse from Scotland who served for many years under the most primitive circumstances and died of an amebic abscess of the liver. Albert Schweitzer had repeated illnesses as did his wife, which impaired and interrupted their work on many occasions. In fact, the life expectancy of a missionary in West Africa at the turn of the century was about six months if he ventured out of a city. West Africa was termed "the graveyard of the white man." Certainly, there have been many changes, but the diseases–except for small pox and yellow fever–are still there and the risks remain for the unwary and the foolish.

Most missionary families in the third world find themselves operating a backyard clinic whether or not they had this in mind. People who are desperate will come seeking help even thought neither the missionary or his wife are doctor or nurse. There are a number of medical problems that can be diagnosed and treated by non-medical people. The approach to this kind of care and the supplies needed will be discussed. Even simple medical help which brings relief or saves lives will show the love and concern that we all should have for those who are poor, unfortunate or ill.

Efforts to minister to people of another culture are made more difficult by a lack of knowledge of that culture. Ineptness in language and cross-cultural communication add to the difficulties. These problems will be addressed at length.

A number of health problems and tropical diseases will be set forth in some detail, hopefully, simply enough so as not to bewilder the non-medical reader. A basic knowledge of each of the infectious or parasitical diseases will be supplied so that the worker can face these problems without fear.

This book is written as if there will be no doctor or nurse to provide help or consultation.

A number of medical students, nursing students, doctors and nurses in practice go to the mission field for short term service. They will find that, although well educated, American schools do not provide instruction in public health, tropical disease, and parasitology so that they do not have even basic knowledge in these fields. It is one of the goals of this text to provide enough information to enable them to recognize and manage most of the diseases and problems that they will face.

All missionary personnel have varying degrees of fear of illness. This is based upon the facts of being away from home and medical help and knowing that there are serious diseases where they are working. They need to know how to protect themselves and their families and not be in constant fear.

One of the books that the author has, is a very large volume about three inches thick, limited to the subject of tropical medicine. A small book such as this can hope to be no more than a primer in this field.

Our purpose is to serve God and our fellow man. This goal cannot be met by sick, disabled or disillusioned missionaries. If this book helps some of those serving in tropical areas to maintain their health and avoid preventable illness or death, then it will have served its purpose.

Acknowledgments

There are a number of illustrations in this book which appeared in the volume, *Where There is No Doctor* edited by D. Werner. This volume is not intended to be a publication for profit and the editor is grateful for the ability to use these illustrations.

The artistic work of Glover Shipp helps to illustrate and to inject a bit of humor into problems which are not humorous.

The editor is very grateful to Belinda Clare who provided typing, proofing, editing, and formatting services.

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Health Considerations for Prospective Missionaries to the Third World

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Most of the comments in this section are directed at those who intend to become long-term missionaries rather than those who plan to stay only a few weeks. Many prospective people are just completing training in a Christian university or in a school of missions. Here they are surrounded by highly motivated and enthusiastic instructors and they are understandably caught up in the enthusiasm and tend to think only of the evangelism and the need of the field. They may overlook their own health as a consideration and in doing so determine that their tour will be a failure because of preexisting health problems that are not compatible with life in an underdeveloped, tropical country.

There are a number of facets of health evaluation to be considered before committing themselves and their family to a major change in environment and life style.

Age alone need not be a deterrent. Historically, some of the best-known missionaries have been over 45 before preparing themselves for the mission field. Albert Schweitzer was among the medical missionaries who was over 40 when he began his medical education. Mary Slessor was another who was mature before becoming a missionary. David Livingston was not a young man when he began his history making exploration and evangelism. In the author's own experience, Sonny Parkhill, a 72-year-old retired mason and severe diabetic, came to Nigeria and worked for two years. He made some real contributions to the work at the Nigerian Christian Hospital. An individual of mature age actually has some advantages over younger colleagues. Among these are maturity, seasoned judgement, and the wisdom of experience. They are frequently more stable emotionally, have fewer interpersonal problems and are not so prone to hasty decisions.

Men and women beyond the age of 60 may have less energy and stamina depending on the degree of wellness and physical condition. There are, however, numerous examples of missionaries of mature age who seem to tire less easily and are able to work harder than their younger associates. There is one career missionary, John Becklof, who is over 65 and can outdo most of the other mission personnel at the Nigerian Bible College, Ukpum, Nigeria.

It is a fact that most people who come to a tropical climate fatigue more easily and require more rest than they do in America.

Health evaluation is a basic necessity before committing one's self to a long term tour in a strange land. This evaluation may take different courses depending on age and sex. A detailed medical history should be taken by a physician, followed by a comprehensive physical examination. The doctor should be knowledgeable not only of the patient but of the country in question and the risks of that area, as well as the medical facilities of the country. The examination should be supplemented by chest x-ray, electrocardiogram (if over 45), stool examination for blood, blood sugar, and cholesterol as well as routine blood count and urinalysis.

For those over 40, sigmoidoscopy or colonoscopy should be considered. Also, in this age range, a stress test is in order. Women in this age group should have a pelvic examination, pap smear and mammogram.

The purpose of an examination this comprehensive is to discover current illnesses or health problems heretofore unknown and which should be evaluated in the light of the destination and deprivation of good medical care. The author is familiar with three missionary women who apparently had undiagnosed cervical cancer before going to the mission field. In each, the disease was in an advanced stage when finally discovered and proved fatal to one.

Common diseases that may become major problems need to be identified and the significance discovered. A brief discussion of some of these follows.

Hypertension is one of the most frequent diseases of American people. It is not a single disease but may have any of several causes. Blood pressure levels consistently over 150/90 is very significant and warrants investigation. Many older people, due to the decreasing elasticity of the arterial system, develop mild systolic hypertension with pressures from 140-160 mm and the diastolic pressure remaining normal. This is relatively benign and requires little therapy other than weight reduction, cessation of nicotine and caffeine intake and perhaps a mild diuretic. More severe hypertension with the diastolic pressure above 100 mm and systolic usually over 170 mm is a serious problem and left untreated will be contributory to stroke, coronary disease, and kidney damage. This requires continuing medical management. The pressure must be continually monitored and medication altered accordingly under a physician's direction.

Severe, uncontrollable hypertension in young people may be due to congenital or acquired stricture of the arteries leading to the kidney. Also, a rare tumor of the adrenal gland may cause severe uncontrollable hypertension. Therefore, severe hypertension in young people should result in aggressive and extensive investigation.

If the patient has severe hypertension and requires close physician management and if the proposed mission point does not have any medical personnel nearby, it is dubious if service in the mission field is wise. Those who have mild or stable moderate hypertension and require a low level of antihypertensive drugs are probably at minimal risk. They should take with them a blood pressure device, which are available at moderate cost. They should take at least a year's supply of the medications required to treat their disease.

Coronary artery diseases are very common in men over 40 and less prevalent in women. Unfortunately coronary disease often remains asymptomatic until a major heart attack (myocardial infarction) occurs and in this event nearly half do not reach the hospital alive. The symptom of angina pectoris is a pain or discomfort over the cardiac region radiating to one or both arms or to the epigastric area which occurs with exertion and is relieved by rest. Those who develop this symptom are in a way fortunate for they have a warning and the opportunity to have diagnostic studies and appropriate surgical or medical therapy before major damage is done.

The fatal episode in many patients is the sudden onset of ventricular fibrillation which is an arrhythmia that stops all cardiac contractions. If it does not terminate spontaneously or is converted by electroshock within three to four minutes, fatal brain damage will ensue even though there is no serious damage to the heart.

The electrocardiogram will detect abnormal rhythms and will show any damage that has already occurred but will not diagnose coronary artery disease. Therefore, a stress test should be done for all over 40 before they consider going or go into the mission field. An abnormal test will indicate the need for coronary arteriogram. Only in this way can an accurate diagnosis be made and the need for intervention be made known.

The patient with angina, and the one with known coronary artery disease, is at risk of a major heart attack or sudden death at any time. These should not undertake foreign mission work. The coronary intensive care unit simply does not exist in the Third World and competent cardiologists are extremely rare. Therefore, it follows that if a myocardial infarction does happen, the chances of survival are greatly reduced. Those who have had successful coronary artery bypass or angioplasty are probably at minimal risk in the mission field.

There are many forms of heart disease other than coronary disease. There are congenital problems and acquired diseases of the aortic or mitral valves which may not be known to the patient until a careful examination is made. Any significant heart murmur or arrhythmia should be studied completely.

In people over 55, vascular disease other than coronary disease is common. The carotid arteries are common sites of obstruction by arteriosclerosis which can result in strokes. It is quite easy to identify this problem by non-invasive methods. Also, in the same age group, arterial disease of the aorta can produce aneurysms (ballooning of the vessel) which are dangerous and should be searched for in the physical examination. Occlusive disease of the terminal aorta and the arteries of the lower extremities cause discomfort or pain on exercise (intermittent claudication) which, if present, should be studied. This entity can cause deterioration and even gangrene of the extremities. This is also easily diagnosed.

Diabetes is a common disease of both young and old. Juvenile diabetes begins in childhood and is a permanent disease—at least at this time. This form requires insulin given by injection daily and requires daily testing of the urine for glucose and acetone and occasional measuring the blood glucose level. A relatively rigid diet is necessary. Neglect of good management may result in the disease getting out of control with the blood glucose rising to very high levels and the blood acidity rising to dangerous levels. Unless managed rapidly, this situation may result in coma and death. Another factor is that other illnesses or trauma may make control temporarily impossible. If the patient takes insulin but has an inadequate caloric intake, insulin shock may occur with the possibility of skeletal fracture or dislocations of joints.

There is another form of diabetes which has its onset in middle age. It may be hereditary in part but is also influenced by diet and obesity. The disease is not as severe and can be usually controlled by diet and oral drugs.

The problem in the mission field is that insulin of the proper type may be unavailable and refrigeration is problematic. The quality and potency of insulin purchased in a Third World country are always in question. Trying to maintain a diabetic diet in the tropics is quite difficult. Another consideration is that if a major diabetic crisis occurs, and even if a doctor is present, the lack of a good laboratory and regular insulin places the patient at further risk.

With these facts in mind it would seem unwise for the insulin dependent diabetic to serve in an area remote from medical care. If they go, they should take a large supply of insulin and blood and urine testing supplies with them. Supplies of bottled sugar solution, candy bars and ampules of 50% glucose for injection should also be taken.

Various gastrointestinal diseases represent another area of concern. Several common ones will be mentioned. Diverticulosis is very common in people over 50 and is usually undiagnosed until infection (diverticulitis) or bleeding happens. There are often multiple diverticula in the left colon. These little sacs are prone to get impacted with bowel contents and infection then develops. A special diet is necessary and infection requires prompt

antibiotic therapy. This is not a contraindication to travel, but the diet cannot be ignored and antibiotics must be available. A bulk laxative such as Metamucil should be taken twice daily.

Peptic ulcer disease, once a very common disease, is becoming less prevalent. At the same time, it has become much easier to manage than at any time in the past. The newer drugs that almost completely control acid secretion have changed the significance of this entity. People with a history of a peptic ulcer should consult their gastroenterologist about the advisability of an extended tour overseas. In general, one should not have to worry about this disease otherwise.

Gallbladder disease and gallstones are very common in any environment. These patients are usually on low fat, low cholesterol diets which are difficult to maintain in the tropics. Acute infection of the gallbladder (cholecystitis) is a threat to those who have had previous attacks and to those who have gallstones in the gallbladder. An episode of cholecystitis can be serious if early aggressive treatment is not possible. Gallstones can enter the bile duct and obstruct the flow of bile with resultant jaundice and liver impairment. If gallstones are known to be present, or if there is a history of previous attacks of cholecystitis, a gastroenterologist should be consulted as to the advisability of travel and of possible surgical correction before travel.

Colon cancer is so common in people over 40 that one should be assured that there is no problem before traveling. This is best managed by rectal examination, sigmoidoscopy (examination of the lower left colon by direct vision), and possibly by colonoscopy if any polyps are found. As mentioned above, examination of the stool for occult blood must be done. A positive test mandates further examinations.

Men over 50 should have the prostate gland evaluated, first by having a PSA test designed to diagnose cancer. Older men often develop urinary obstruction from enlargement of the prostate. If there are symptoms of difficulty in initiating urination, small stream, and urgency, a urologist should be consulted before committing oneself to travel.

Patients with chronic kidney disease, particularly if there is any measurable impairment of renal function are not candidates for long term service overseas.

Asthma may begin in childhood and be a lifelong disease. Recently there has been a great increase in the development of asthma in middle-aged individuals. The disease may be allergic in origin but in the majority of victims there is no allergic component. It has been the author's observation that people with preexisting asthma have much more difficulty in West Africa than at home. Asthma in severe, acute episodes can be serious and require

aggressive therapy. Respiratory infections often bring on attacks of asthma or complicate asthma. It is the writer's opinion that those with asthma requiring continuous therapy or who require periodic steroid treatment probably should not go to the mission field.

In West and Central Africa there is a dry season from December to March. During this period, fine dust from the Sahara desert fills the air continuously. During the "harmatan," it has been the experience that asthmatics in the native population have much more difficulty. Many develop asthma during this period who do not have it at any other time. The incidence of pulmonary infections also increases during this time.

Chronic bronchitis affects many people and, again, if they require continuous treatment or frequent antibiotic treatment, probably should consider carefully before going. There will be no respiratory therapy equipment available.

Chronic anemia of any origin may pose problems unless it is a simple iron deficiency anemia. It has been the observation of doctors in the tropics that women of the white races have a higher incidence of anemia than while in America. When the author was stationed on Guam this was certainly true. Considerable investigation failed to demonstrate a cause. Certainly, any significant degree of anemia should be diagnosed and corrected prior to travel.

Final Preparation and Check list

Allow at least one month and preferably six weeks for health evaluation and planning. Take all necessary immunizations in their proper sequence.

Those with significant medical problems should obtain a letter from a physician stating the problem and treatment recommendations. Carry a card or have a bracelet indicating special medical conditions, including allergies.

Obtain a full supply of the medications that are regularly required. These should be carried in the carry-on luggage. Take copies of all prescription drugs and other medical supplies. If glasses are worn, take an extra pair and a copy of their prescription.

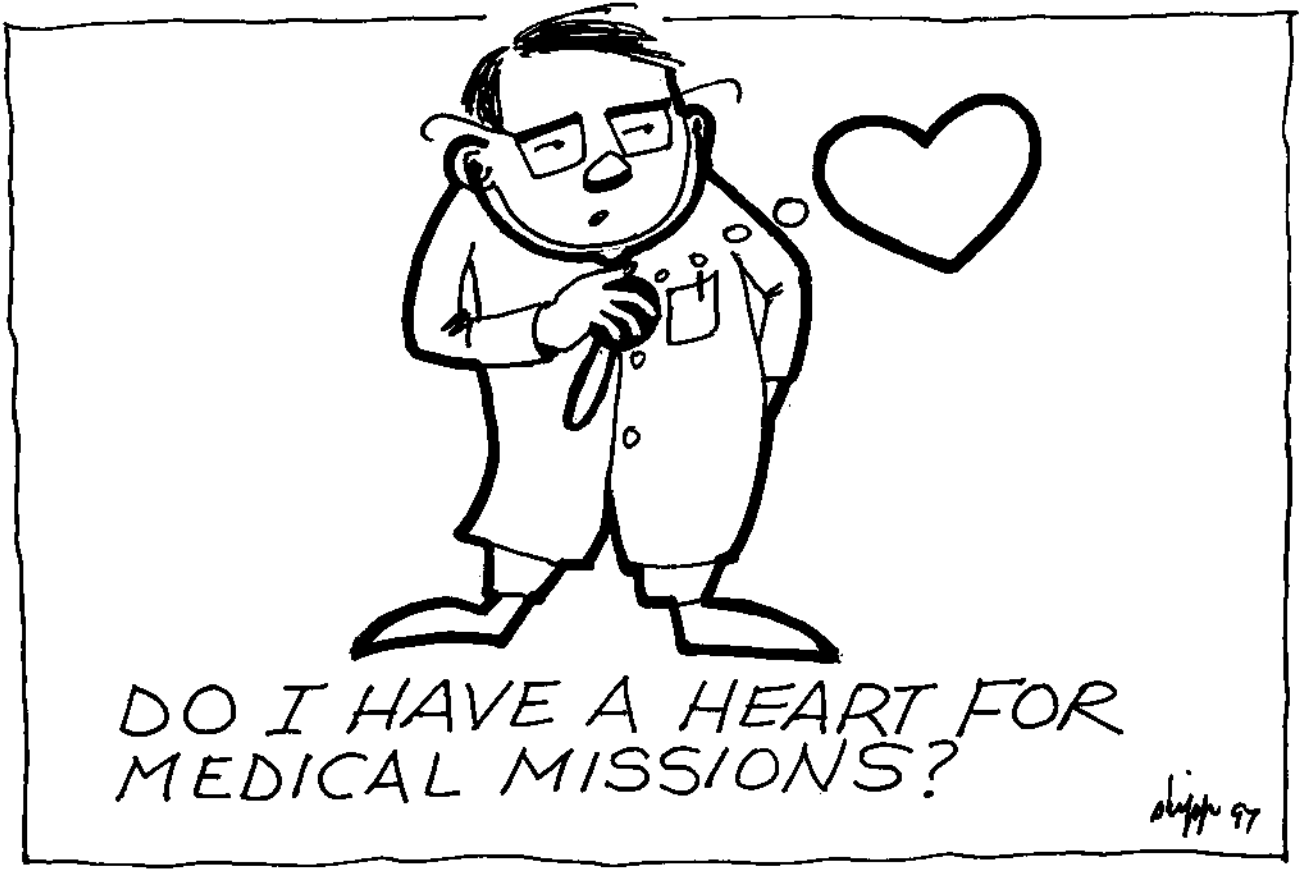
A traveler's first aid kit and drug list will be found at the end of this book.

Check with your health agency or insurance company to see if there is overseas coverage. Foreign hospitals and doctors will not accept insurance as payment, therefore carry sufficient funds with you to cover emergency expenses. You can file with the insurance company at a later date. If your insurance is not effective overseas, obtain at least a temporary policy for this purpose. Medicare does not cover medical expenses incurred outside the country.

The foregoing material has not been designed to frighten prospective missionaries, but rather to cause him or her to look at their state of health realistically. There is no use in committing to a long term mission endeavor only to find yourself seriously ill with a preexisting condition or unable to carry out the strenuous activities required because of physical limitations not considered. In some fields, it is relatively easy to arrange transportation home in case of illness; however, in West Africa it may take two to three weeks just to arrange travel and if the patient is seriously ill, the airlines may refuse to permit travel unless there is a doctor in attendance.

The financial impact of illness in the mission field is a major problem and the necessity of emergency travel is an extremely expensive event.

For these reasons the writer hopes that prospective missionaries will consider their health as one of the factors involved in their decision making.


DO I HAVE A HEART FOR MEDICAL MISSIONS?

Chapter 2

Psychological Factors in Missions

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A significant percentage of those who go to the mission field do not return after their first trip home, and many come home before they have fulfilled their agreed upon time. Dr. Stanley Lindquist, professor of psychology at California State University, and president of the Link Care Foundation (a group which gives psychological help to missionaries), estimates a failure rate of 20% to 50% for first term missionaries.[1] A similar problem appears to face companies who send personnel overseas. An article in the Wall Street Journal claims that 25% of persons sent abroad by their employers, return home early. The article states, "Whatever their problems were before they went over will probably get worse overseas."[2]

Additionally, there is the problem of the missionary who is unhappy, maladjusted, homesick, burned-out, convinced that he/she made a mistake in going to the mission field, but who is determined to remain for the contracted time.

Whether they remain doggedly on the field, or go home prematurely, these missionaries may return bitter and disillusioned, filled with doubts about themselves, and sometimes even doubting God. At the outset, they were dedicated servants of God with a mission, enthusiastic and optimistic about what they were about to do. What happened to bring about this change? The reasons appear often to be more psychological than spiritual, and point to inadequate preparation in some very important areas.

Much of the success on the field will depend upon the quality of motivation, and candidates need to be encouraged to honestly assess their reasons for wanting to do missionary work. Some unacceptable motives would include: not successful in work at home and hoping it will be different on the mission field; unresolved personal problems which it is felt may be resolved through missions; as an effort to escape certain problems in the church; going to the foreign work in an effort to find a personal faith; going to please someone else; going legalistically out of a sense of duty; or doing some missionary work as a stepping stone to some future work or position.

Acceptable motivation tends to be the logical and natural outcome of the spiritual growth of the missionary candidate. Those who have worked long and successfully in the field have indicated some combination of the

following motives: a love for the lost; the Lord said go; a matter of practicing what you preach; a sense of duty growing out of love for the lost and for the Lord; a realization that the gospel is for all; the results of certain experiences which enabled the candidate to see a particular need toward which he/she felt drawn and responsible; the result of the influence and example of others who had gone to the mission fields of the world; and as the outcome of a pioneer spirit (like Paul's) which created a desire to preach the gospel where it had not been previously presented.[3]

In addition to injury which may be done to missionaries who withdraw prematurely from the field, there may be injury done as well to the mission enterprise with which they are involved. Negative aspects may include the bad press given to missions, the negative influence on other workers, discouragement of the nationals, and of course the tremendous financial cost. However, it should be said that those persons who conclude that they have misread God's call, should in fact be encouraged to return home. In the long run it will be less expensive to the sending agency, and less painful to the persons involved.

All of the above raises the issue of missionary selection! Is there some way that missionary failure can, if not be eliminated, at least be lessened? One researcher did an extensive examination of missionary dropouts over a ten-year period, as experienced by a national sending agency. The pertinent factors included: the location of the field (it was much higher in South East Asia than in other parts of the world); the amount of education (students who had done graduate study were more likely to stick); and family composition (those with two or more children were more likely to remain on the field). In this study, factors which seemed to have little influence on the staying power of missionaries included: grade point average, age at entry to the field, the length of time since conversion, and the length of time engaged in domestic church work before going overseas.[4]

There are many other things that can be done to improve the selection process, and also to give needed help once the missionary is in place. It would be good to take a close look at the track record of the missionary candidate. How well has he or she performed in prior church service? What has been the quality of the personal life and social adjustment of the candidate? What have been the honest evaluations given regarding the candidate on the part of those who know him or her well (including spouses and children)? Does an appropriate psychological test turn up problems that would predict major difficulty on the field?[5]

Sending churches can improve the lot of their missionaries and help them stay happily on the field by developing a better acquaintance between the supporting church members and the missionaries. This may involve the

missionary candidates spending time with the sending church before going to the field. It also helps to depressurize the working situation by having a well thought out and mutually agreed upon job description for the missionary.

Once the missionary is on the field, extensive and regular prayer support should be offered by the sending church. Journals, books, tapes, videos, and letters sent to the worker on the field by the congregation can be of great benefit and encouragement. As much as can be done should be done to create a sense of partnership (see Philippians 4:15) in the missionary effort. The missionary's schedule should be monitored to ensure that regular days off are taken, as well as occasional breaks for rest and relaxation. Trips home at agreed upon intervals are very necessary, with care taken that the missionary is not worked to death during the home stay! An occasional refresher course should be provided, either at home or on the field.

Regular visits by church leaders will be beneficial if they are more intent upon seeing the work and encouraging the worker, than being led about as tourists! If the nature of the work so indicates, special programs and campaigns which bring members to the field from the supporting church for brief periods of work will both encourage the missionary, and increase the sense of enthusiasm and participation on the part of the members.

Sending agencies should be alert to potential problem areas on the field and be ready to help through personal counsel, or by making available needed specialized personnel. These might include: stress related to adjustment to strange standards and cultural norms, the sense of isolation that comes from being separated from one's ordinary support groups (family, church, friends), personality problems (sometimes previously unrecognized, but which surface on the field), family matters, the gap between expectations and on the field realities, role confusion, problems of personal motivation and spirituality, moral issues, legal matters, financial difficulties, and relationships with fellow workers. These will now be dealt with briefly in the remainder of this chapter.

All missionaries will agree that the mission field, notwithstanding its many rewards, is a typically stressful place. Efforts to effect personal adjustment and good relations with co-workers may be thwarted by stress. Some important stresses are: communication difficulties (especially where a foreign language is involved), a sense of isolation and loneliness, and a feeling of estrangement (you are the foreigner!).

There are many emotional problems involved in attempting to acquire a new language. It is difficult to describe the feelings of one who is suddenly stripped of the most primary means of social interaction, or is reduced to a level of communication like that of a child two or three years old. In addition, one becomes aware of levels and means of communication which are new

and may be difficult to adapt to (hand and body communication, volume, differing views of the meaning of time, the approved speaking distance). The problem of communication is further complicated by the differences in formal and informal address, issues that may be so complicated that the learner is often unsure as to exactly what form he should use in addressing another person.

Stress often results in hostility which in turn frustrates efforts to work together with others in the missionary enterprise. A study undertaken at Fuller Theological Seminary examined the manner in which missionaries express hostility. It is interesting that for the general modes of hostility expression (assault, irritability, resentment, suspicion, verbal hostility), the missionaries in the study scored lower than the norms. However, in two areas they did not differ significantly from the test norms. The factors in question were indirect hostility and negativism. In their discussion of these variables, the researchers suggested that missionaries appear to feel free to use the more indirect means of showing hostility. One form that hostility might take would be oppositional behavior (passive noncompliance), and general negativism. Note the following statement:

The data suggests that the style of hostility expression most acceptable to the missionary may be one which relies on indirect means of dealing with one's anger. Such a style is potentially destructive in relationships. Combined with a pretense that nothing is wrong, it is extremely difficult to deal with interpersonally. It consists of a subtle undermining of relationships, angry or sarcastic undertones, criticism, etc. It creates an atmosphere of generalized, undefined unhappiness.[6]

A sense of isolation, loneliness and homesickness should typically be either occasional, or a developmental stage that one goes through. There are a number of things that will help one resist these debilitating forces. Relatives and friends at home should be encouraged to be supportive and upbeat in their communication with the missionary. The missionary must dominate the tendency to compare field things to things at home. It is also a mistake to allow oneself to spend much time daydreaming and imagining what it would be like to be at home. A great deal can be achieved by developing close friends on the mission field, particularly among the nationals. Every effort should be made to buy local products, rather than compassing land and sea to find "US made" products. Forcing oneself to take an active interest in the history, music, art, sports, customs, and places of beauty in the host country will prove most helpful. Paul's admonition that God's servants should make it their aim to become all things to all people is certainly germane (I Corinthians 9:19-23).

It is only recently that a scientific approach has been used to evaluate personality variables of missionaries. One of the problems consists in the fact that no one can establish exactly what personality characteristics a missionary must have to be successful. The Bible gives spiritual models (Matthew 5:1-6, Galatians 5:22, II Peter 1:5-11), but these do not touch on many important facets of personality development.

Research done at Trinity Evangelical Divinity School examined personality traits of 827 evangelical missionaries. They found that missionaries tended to project very positive personal appearance; that females were more reality oriented than males, and more rugged in handling difficult situations; missionaries were more worry-prone than the average population, and tended to struggle more with their present reality. They were found in this study to be visionary, somewhat impractical, good at getting back up from emotional problems, and were typically dominant, independent leaders.[7]

Various studies have attempted to pinpoint the personal qualities of the successful missionary. Cureton reported on a study involving forty-four mental health professionals, missionary leaders, and persons with missionary personnel experience. Their list included: powers of persuasion, ability to gather and classify information, the ability to operate necessary machinery, math ability, possessing language skills (verbal, written, interviewing, and reading comprehension), organizational ability (problem solving, dealing with numerous variables, dealing with ambiguity), emotional maturity, willingness to relate to others, and flexibility.[8]

Britt's study involved 111 male and female adult overseas workers. He found that the "good missionary" is controlled (good work habits and controlled emotions, good at organizing, dependable at getting things done), not moody, first born, socially adept, insightful of self and others, tends to group cohesion more than stating opinion, younger (optimal age for beginning 25-30), relates well with others, tends to question authority and struggle with directives (not rebellious but more assertive with superiors), lower on social poise (thus less traditional socially, and freer to adapt), has ability to persevere through difficulties, tends to struggle more and pray more when things do not work out as expected (perhaps showing more realism and honesty), and had less father absence in the "growing up" years.[9]

Problems may occur either in the overseas portion or the home portion of the family. Unfortunately, Christians sometimes have the mistaken idea that they either should not have family problems, or they should be able to handle them. As a result, they often wait so long to seek help, that their difficulties may have compounded to the point that remedy may either be complicated and time-consuming, or beyond peaceful solution.

The fact that one is a dedicated missionary laboring sacrificially in sometimes difficult surroundings for the Lord, does not make that person immune to family problems. Some of these may occur among family members that have been left behind. In such case, there will be a sense of frustration and helplessness, coupled often with a deep longing to be at home to aid in whatever way possible. It helps to have prepared one's mind for such an eventuality before departing for the field. Those who have experienced such crises have found a greater reliance on prayer and in other spiritual supports including the comfort of fellow-workers. If the issues in question can be benefitted by the counsel of the missionary, this can still be offered by letter, or by telephone. FAX possibilities offer increased advantage for immediate and extensive written communication. If the emergency is sufficiently great, short trips home are possible. In the instance of bereavement, many field-workers have found themselves in situations which did not permit their physical presence to grieve with and comfort their loved ones, and have had to do this from a distance.

Problems may erupt within the immediate family of the missionary. Missionary failures are often family failures. These may be occasioned by conditions or happenings that occur on the field, or they may represent issues that were smoldering below the surface which have been compounded by, but not caused by, the stress of missionary work. It is also possible that a missionary may be so concentrated on doing well in the external work of the church, that insufficient attention is given to doing well in the internal work of the church in the family. Children of missionaries have sometimes remained bitter about their experiences on the field because of their feelings of abandonment and of having been emotionally shortchanged by their parents. Missionaries as well need to be reminded that they have no higher priority than the basic spiritual and physical responsibilities they have to their own families. A well-known scripture may be paraphrased, "What does it profit a man if he gain the whole world and lose his own family?"

One sure sign of mounting problems is the breakdown of communications. Good lines of communication must be maintained within the family if negative emotions are to have an opportunity of surfacing and being positively dealt with before they fester and cause severe damage. Every effort should be made to reach the deepest levels of communication with one's spouse and children, proceeding from the more superficial kinds of exchange that have to do with things and events, to the discussion of persons, ideas, feelings, and ultimately, to self-revelation.

Although it is hard to be objective about one's personal problems, a great deal can be done through self-help approaches. There are many good books and articles available that deal with the typical kind of challenges

that come up within families. In addition, help may be available through the intervention of fellow workers on the field. While it is difficult to admit to peers that problems have arisen which are beyond the solution of the parties involved, missionaries should be aware that a sense of shame or foolish pride can complicate solution and lengthen the recovery process. Sponsoring churches can also be very helpful. It is not unusual for appropriate professionals to be sent to the mission area to offer more technical assistance. In extreme cases, the family may be brought home in order that intervention can occur immediately before irreparable harm is done. If the therapy that is demanded is extensive, it may be best that the family involved be encouraged not to return to the missionary situation.

It may be true that missionaries tend to be idealistic. The very nature of faith seems to create a very positive expectancy in life. Persons who go out bearing the message of Christ believe they are led to do so, and that good will come from their efforts. In many instances, their expectations will far exceed outcomes. They may find nationals to be not noticeably happy that the missionary is there in the first place. They may be turned off by the motivation of some who initially seem eager to learn about Christ and His gospel, but later prove to have much more earthly and immediate aims in mind. They may expect to make much better progress in the language and in cultural assimilation than in fact proves to be the case. They may be deeply disturbed about their homesickness, and what appears to be a much more superficial faith than they had previously recognized in themselves.

This gap between expectation and reality will almost always be there, and must be dealt with. It helps to remember that God has made Himself responsible for results (I Corinthians 3:6), and He has promised that His word will accomplish what it is intended to do (Isaiah 55:11). It is not always clear in the missionary endeavor as to the exact nature of the work being done. If the missionary expects to reap a harvest where the Word has not yet been sown, disillusionment will surely result. As noted above, the Apostle Paul was often involved in planting, while the watering was done by someone else. It is also true that stones and stumps may have to be cleared out before anything can be planted. One missionary worked 17 years in Paraguay before achieving his first convert.[10] The challenge to realistically come to grips with one's situation in the mission field can be an important spiritual step for the missionary.

The problem of one's role in missions can be most challenging. The missionary is told to identify, but to be careful not to over-identify (some have gone native and ended up joining the opposition!). The mission task demands that new converts be brought to independence in Christ as soon as possible, but missionaries are warned not to abandon them prematurely lest

they die. On the other hand, missionaries are not to become perennial "parents" who make themselves so necessary to the mission effort that new members find their own initiative stiff led and that they are doomed to be spiritual babes forever. The gospel is to be adapted to the culture, but care must be taken against compromising the message. There will no doubt be some adjustments required in one's view of a role, and of role implementation as experience is gained. Missionary theory looks good on paper, but remains of unknown quality until tried in the fires of practical experience. The manner in which a role is developed will also vary from person to person in terms of the place, experience, talents, learning, and the nature of the people with whom the missionary is working. Of one thing the missionary may be sure—the task is always the same. The task is to work oneself out of a job and leave as soon as it is safe to do so. The real quality of missions consists in that which remains when the foreign worker has left!

Many missionaries also report strong feelings of guilt. This sometimes comes as a result of culture shock. It may come because of slow progress in the language, in adaptation to the culture, or in the progress of the work itself. Guilt may also relate to personal discoveries that may be chilling to the missionary. It may be discovered in the mission situation, remote as it is from the lifelong props of family, strong local church, friends, and sheltered environment, that one does not have the spiritual maturity and strength that he or she had thought to possess. The missionary may demonstrate this immaturity by behaving childishly over simple things like traffic patterns, throwing temper-tantrums over bugs or dirt, projecting blame on others for personal failures, and becoming upset over changes that are required in the course of the mission work. The missionary may also feel guilty about the original motivation that led to the mission field. Perhaps the exotic nature of missions, or the lure of travel, or the desire to get away from someone or something had more to do with going to the field, than did the more acceptable spiritual aspects of motivation. Guilt may bear down on the missionary to such an extent, that the field will be abandoned. A better solution is to deal with the guilt.

None of the things mentioned above will be unique to a particular missionary, nor are they necessarily fatal. Facing up to these issues can be the key to maturity and growth. Missionaries can change to more acceptable motivation, just as the people of Samaria told Jesus originally they had believed in Him because of what the woman at the well had told them, but later they believed because of having personally experienced Christ (John 4:39-42).

Problems of a legal nature are not unknown on the mission field. The Apostle Paul, of course, had his share! Throughout history missionaries have been arrested, jailed, killed, expelled, had buildings closed (in the 1950s this writer was in three church buildings in Italy when they were closed by

police action), plus a variety of other legal entanglements. In a more benign vein, achieving legal status for the mission workers, procuring property, or handling tax matters may all require expert legal help. As much as possible should be learned about such matters before leaving for the field, and once there, it is good to at least know where to go for expert advice or legal assistance. This information may be obtained from other missionaries, from local friends, or through United States agencies such as consulates or embassies.

Moral issues do arise in the lives of missionaries and their families. Some have so compromised themselves morally, that their effectiveness has been ruined. Many factors will help decide whether or not a specific moral lapse can be dealt with on the field without interrupting the service of the missionary, or should be considered sufficiently severe to end the mission activity of the party involved. Of course the best solution is to defend oneself against such an eventuality ever occurring. A good procedure will involve: realizing that one is not invulnerable, staying away from circumstances of temptation, keeping an open life-style with a lot of people contact, surrounding oneself with safe company (being alone can be lethal for some), plus being spiritually girded with prayer and constant meditation on, and study of, the Word.

Financial difficulties are also common with church workers on foreign fields. These may occur because of improper budgeting or impulsive spending. Occasionally, workers have gone to the field without adequate knowledge of the real costs involved. At times, workers have lost support after arriving at their missionary destination (some congregations appear to identify very little with the plight of the missionary who is depending on their support when that support is summarily withdrawn!). Whatever the source of the financial problem, the missionary involved will find it hard to keep a proper focus on the missionary task. Fellow workers are usually willing to share for the short term, but this of course cannot be a long term fix. Supporters should be fully apprised of the nature and cause of the financial difficulty, and provided with good documentation. If a solution is not found, the missionary may need to return home and seek supplementary support.

It may seem contradictory, but missionaries occasionally find themselves drained dry spiritually, and in genuine spiritual crisis. "Physician, heal thyself" is not necessarily a bad indication for the missionary. Frequently, so much time is spent studying for the benefit of others, that the missionary forgets to go to the Word for his or her own spiritual needs. Prayer may be so indicated to the needs of others, that the necessary time for reflection upon one's personal spiritual needs is not taken. This can be avoided by seeing that a routine of personal spiritual discipline be practiced. This will include adequate time for personal contemplation of the Bible, seasons of fasting

and prayer, times of break from one's work for the purpose of spiritual renewal, and seeking out retreats and special meetings designed to refill the missionary tank. More will be said in a later chapter which deals specifically and at greater depth with this issue.

It is sad to say that one of the most perplexing problems in missionary work is found in the challenge of living and working together with other missionaries. Studies have repeatedly shown that the inability to get along together is a major issue among overseas workers of the church. This is not a new problem! (See Mark 9:33-37, Luke 9:46-48, Matthew 20:20-28, Philippians 4:2.) While the Lord has shown that he can work through people who fuss, it is also true that when stress levels are reduce, the work proceeds better. Therefore, it is important to understand why groups of people who are dedicated to the Lord, sincere in their sense of purpose, and willing to make whatever sacrifices necessary in achieving their goals on the field, may end up at each others' throats, almost hating each other.

While most people think themselves to be objective observers of what is going on about them, and tend to see problems as "out there," the truth of the matter is that people often project their inner situation into the external situation with which they are dealing. Consequently, an understanding of ones own internal condition is most important in assessing the interpersonal situation. The unwary person can easily project personal confusion, frustration, lack of role, sense of failure, discontent, homesickness, guilt, and feelings of inadequacy upon the group, thereby incredibly complicating whatever issues may be involved.

In group activities it is easy to be threatened by persons of greater or diverse talents. This may result in feelings of hostility which may be turned inward, resulting in depression; or turned outward resulting in envy and jealousy.

Unfortunately, some persons who end up in groups have a previous track record of working alone. This is often the case with ministers. Ministers frequently have to work independently with little or no supervision. They may be very free to decide, project, execute, and to come and go very much as they please. They may become such loners and become so afflicted by the "do your own thing" philosophy, that it is very difficult (if not impossible) for them to fit compatibly within a group. For this reason, it is good if groups can spend extensive time together before going to the mission field in order that "group fit" can be measured. Group work is much like a marriage!

Some missionaries are psychologically isolated, remote, aloof, cold, formal and polite, unknown and unknowing to the extent that group functioning for them is very problematic. Being a member of a close group in a foreign work place is not a good situation for a person determined to hold others at a distance and maintain a high degree of privacy.

Rigid persons have a hard time functioning in a situation where shared decision making (often requiring compromise) is mandated. For such an individual it is easy to see right (his or her view), and wrong (the view of the others), in every situation. It is also easy for opinion to become principle (if not Scripture!). In addition, if this person is defensive, there will a tendency to be reactive to the rejection of ideas or suggestions, confusing this with personal rejection by the group.

A possible irritant in groups consists in the fact that they are made up of persons of varied habits and life styles. Some are early arrivers, while others always get there a little bit late. Some are spontaneous (impulsive) who make decisions on the spur of the moment, while others are highly organized and plan ahead. Some are content to "just get by" to meet a minimum demand, while others are perfectionists and want everything to be done at the highest level. Some get up in the morning and are zombies until about the middle of the afternoon. If they had their choice, they would sleep in every morning, and stay up late at night. Others like to get up early and hit full stride immediately, but begin to wilt when the sun goes down. The list goes on and on! Obviously, it is not easy for such diverse persons to patiently accept each other (warts and all) and work compatibly together.

Input in a group (or with another person) is like ammunition. A given individual has only a limited amount. If their ammunition (input) is used indiscriminately or carelessly, such a person may frequently be in a situation where his or her input is needed but can no longer be received because all available ammunition has already been used. There are those who try to be heard in every situation, who try to criticize, correct, suggest, or otherwise have decisive input in everything, and eventually have no influence at all. Or they may be deeply resented, and considered dictators. Others carefully measure their ammunition, using it when and where it really is important and will count the most.

The very nature of missionary work requires people who are highly talented. However, there is great variation in both the gifts possessed, and the rate of progress that is made on the part of missionaries. It can be very upsetting to labor alongside a fellow worker who is more gifted than you are linguistically, adapts more easily to the new culture, or has achieved a more open and ready acceptance by the nationals. If one is not careful, depression or jealously may result.

By way of solution, group members often need to learn a better way to respond to what may be perceived as negative stimuli. While it is very easy to allow others to more or less set the agenda by just reacting to whatever they do or say, there is a better process called "reinterpreting the stimulus." This allows one to look beyond the words and actions of others and try to

understand what lies behind them. In this manner it is possible to direct one's response in a constructive manner. Christ did this on the cross. As he looked out at the mob which had put him there, he could have just reacted by having fire come down from heaven to consume them. After all, look at all he had done for them, and now look at how they had responded. Instead, he looked beyond their actions at their ignorance and confusion and prayed "Father, forgive them for they know not what they do." (Luke 23:34) A fuller understanding of why others act as they do arms a person to be more on target in response, and a different kind of response will frequently disarm others and set a more positive tone for mutual work and communication.

It would be beneficial for every person who intends to function in a group, to take a course in group dynamics. A review of Biblical passages, that touch upon group functioning is of course mandatory. Note the following thoughts from the New Testament. Group members should be humble (Romans 12:3, Galatians 6:3, James 4:6,10), so devoted to each other that they seek to give honor to others (Romans 12:10), empathetic (Romans 12:15, I Corinthians 12:26), not haughty or wise in their own eyes (Romans 12:16, I Corinthians 8:2), and not vengeful when wronged (Romans 12:17,19). Group members function best when they promote peace (Romans 12:18, James 3:17-18), let love be their only debt to each other (Romans 13:8, I Peter 1:22, 3:17, I John 2:7-11, 3:16-17), avoid judging or putting up stumbling blocks (Romans 14:13), avoid using personal liberty destructively (Romans 14:16, I Corinthians 6:12, 8:9-13, 10:23, Galatians 5:13, I Peter 2:16), and work to build each other up (I Corinthians 12:25, I Thessalonians 5:11). They should follow Christ's example in supporting the weak and in not pleasing themselves (Philippians 2:1-4), in being of one mind and accepting each other (I Corinthians 1:10, Romans 15:5-7), by agreeing together and avoiding divisions (I Corinthians 1:10, 3:1-3), and by not being arrogant, as all that one has was given from above (I Corinthians 4:6-7, II Corinthians 3:5).

Members of a group should be willing to suffer wrong rather than become a spectacle before the world (I Corinthians 6:7, I Peter 2:19-20). They are also urged to not be grumblers (I Corinthians 10:10, Philippians 2:14-16, Hebrews 12:15), realizing they will not be tried beyond their ability to endure (I Corinthians 10:13). It helps to realize the Spirit works in each for the common good (I Corinthians 12:17, 14:5,12,17,26,31), and also for good order (I Corinthians 14:33,40, Colossians 2:5). Those under Christ's control have a love which helps avoid selfishness (II Corinthians 5:14-15), and permits them to do all things for and in love and be subject to one another (I Corinthians 16:13-16, Ephesians 5:21, Hebrews 13:17). Let one's boast be in the Lord (II Corinthians 10:17-18), do not make comparisons among yourselves (II Corinthians 10:12, Colossians 3:23-24), and love each other rather than biting and devouring one

another (Galatians 5:14-15). Correct gently those who are to be corrected, being careful not to sin in the process (Galatians 6:1), bear one another's burdens (Galatians 6:2), speak truth in love, not anger (Ephesians 4:25-27, Colossians 3:8-15, James 1:19-20,26), watch your speech avoiding malice while practicing forgiveness (Ephesians 4:29-32, Colossians 4:6, Titus 3:1-3, James 3:1-18, 4:11), and make every effort to walk in a manner that is worthy of your calling (Ephesians 4:1-3).

Group members are to live in harmony (Philippians 4:2), working to present each other complete in Christ (Colossians 1:28-29), each working hard and minding his or his own business (I Thessalonians 4:9-12), while not getting tired of doing good (II Thessalonians 3:13, Galatians 6:9-10), giving special attention to showing hospitality (Hebrews 13:1-3,16, I Peter 4:9), and recognize that the main source of temptation and inducement to evil comes from within (James 1:13-15, 4:1-4). Do not play favorites (James 2:1,9,13), confess your faults to each other, and pray for one another (James 5:16), watch out for jealousy (I John 3:11-12), cover each others' sins with your love (I Peter 4:8), practice patience (Ephesians 4:2, Philippians 4:5), and pray for each others' forgiveness (I John 5:16-17). Care must be taken to resist love for the top spot (III John 9), and in everything, practice the Golden Rule (Matthew 7:12).

It is very important that group members provide for an atmosphere of open and respectful exchange in which problems and plans can be dealt with in a loving and patient manner. They are also wise to arrange group meetings on a regular basis specifically for the purpose of group maintenance. In 1985, this writer spent a week in Haiti in a group dynamics session with a medical mission team of the churches of Christ. In the course of that week, this group formulated the following ground rules for group meetings:

1. All available members should be present for each meeting.
2. No problem involving an absent member should be discussed during his or her absence.
3. No gang tackling.
4. As much as possible, discussion of either group or individual problems should be confined to the meetings.
5. If a problem erupts between two persons, it should be settled between them if possible, and not brought before the group.
6. When the primary parties cannot resolve whatever issue exists between them, it should be brought before the group. Each person should be allowed to speak without interruptions. If there are two persons involved, each should be allowed to speak before the group gives a response.
7. As a general rule, feelings and facts should be discussed, rather than there being an attack on persons.

8. Each should be free to express feelings, but not forced to share more than he or she is comfortable in sharing at the moment.
9. Accept the validity of each individual's feelings.
10. Statements should be specific and to the point.
11. No garbage dumping—do not bring up past events that have already been dealt with.
12. Every effort should be made to leave each meeting without bad feelings toward other members of the group.
13. Group meetings should not be limited to, or even primarily oriented toward negatives. This should be a "buildup" time.
14. There should never, under any circumstances, be verbal abuse.
15. In each meeting, spend time reading scripture—begin and end each session with prayer.
16. Matters of opinion are to be left as such rather than becoming mandates for the group.
17. Every effort should be made to resolve a particular problem within a given session. The group should pray about the resolution before proceeding.
18. Occasionally, group processes may be facilitated by the inclusion of an outsider. Such inclusion should be rare, and the outsider should be oriented as to the group procedures.
19. In all instances, the Golden Rule should be applied.
20. Keep in mind that each has made a commitment to God, to the work, and to the group.
21. Regular times should be set, and clearly advertized to all group members.
22. A decision should be made by the group as to a leader or a moderator.
23. Allow time for confession and prayer.
24. Each should work on becoming vulnerable, a necessary step in building trust.
25. Never come to the meeting loaded to get your pound of flesh. Remember the Biblical injunction—Those who show no mercy will receive no mercy!

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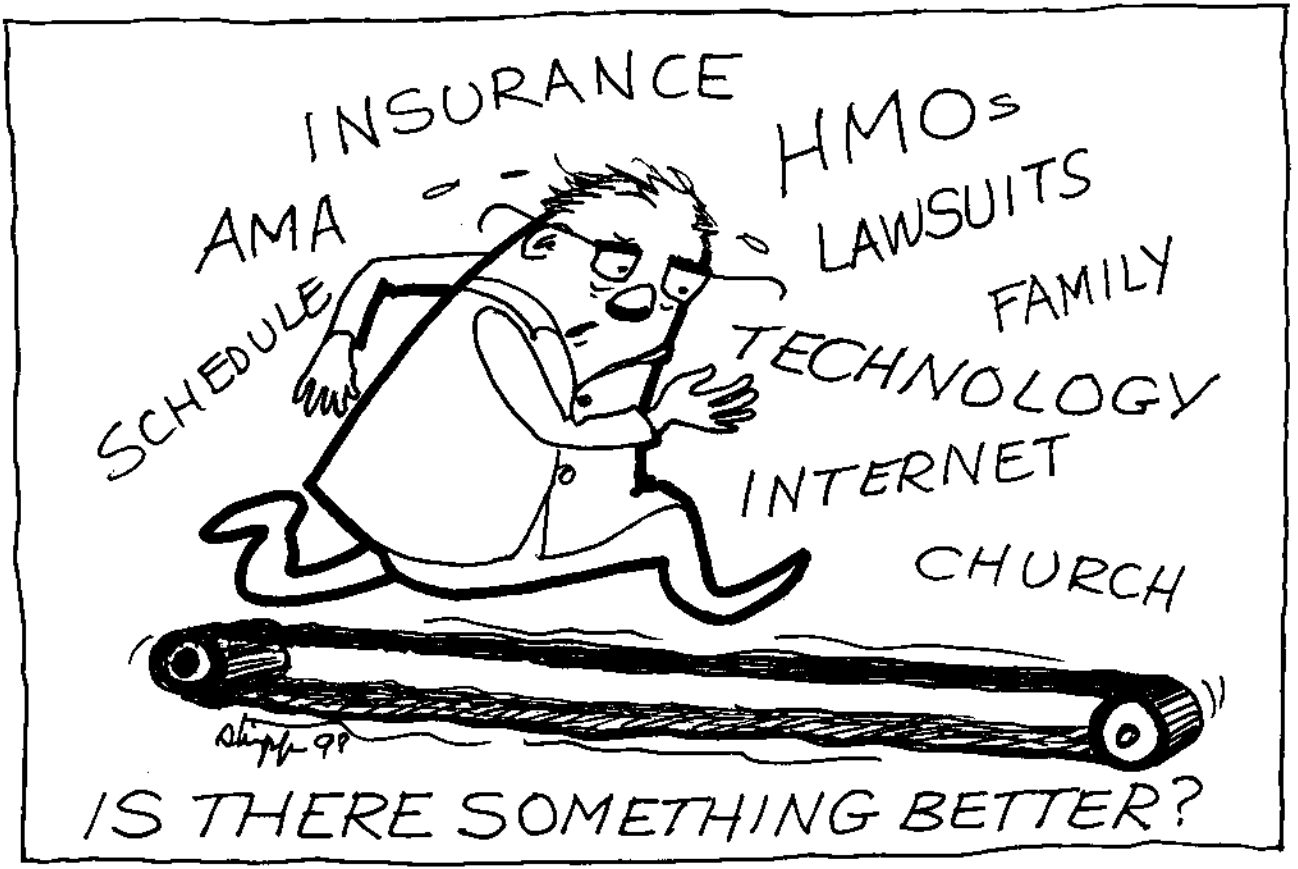
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Chapter 3

Health Evaluation and Final Preparation Prior to Entering the Mission Field

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The preceding chapters outlined some of the physical and medical considerations that need to be made before deciding on a long term stay in the mission field. The statements in this section are directed to those who have made the decision to go. Please refer to Dr. Mitchell's chapter on psychological evaluation since this chapter will not discuss that area.

A passport should be applied for at least six months prior to travel. Begin the process of obtaining a visa at least three months before travel. Obtain advice and help so that denial of a visa is less likely.

First, one should contact an experienced missionary or one of the schools of mission and learn as much as possible about endemic diseases, water supply, sewage, insect control, and climate of the area. Contact your physician or HMO at least two months ahead of travel time and explain in detail the trip, destination and any health problems that you are aware of. It is wise to contact your health insurance carrier and see if it is effective in the country to which you are going or even outside the USA. If not, you should obtain a policy that is effective anywhere.

A comprehensive physical evaluation should be requested which should include a detailed physical examination including a rectal examination and a pelvic examination for women. The laboratory studies should include: chest x-ray, electrocardiogram, hemoglobin and hematocrit, white blood cell count and differential count, blood chemistry screening, PSA in males and cervical cytology in women. Mammograms in women over 40 should be done if they have not been done in the past two years. Additional studies may be indicated depending on the doctor's findings and facts derived from the medical history.

This type of evaluation will not be covered by any form of health insurance or Medicare and will require an expenditure of $300 - 400 but it is money well spent.

An international health booklet should be obtained from the health department or from a clinic that has a travel clinic. The health department can tell you what immunizations are required. Some of these must be initiated a month or so in advance so do not wait until the last moment. In addition to

the required immunizations, the author recommends hepatitis B immunization and rabies. Typhoid and tetanus immunizations should be current. It is also recommended that in African countries 4 cc (adult) of immune globulin should be taken. This will provide passive immunization to hepatitis A for about three to four months. Hepatitis A vaccine is now available. If this is taken, the immune globulin will not be necessary.

The health department, your doctor or a missionary who has been in the area can tell you whether malaria prophylaxis will be necessary and if so what drug should be used. Generally, Chloroquine (Aralen) is used and should be started two weeks ahead of travel. In an area where P. Falciparum is predominate, resistance to Chloroquine may determine that mefloquin may be used. Alternate drugs are available if there are specific allergies to these drugs. Aralen, if it is to be used, should be obtained in quantity because it is enteric coated and is tolerated much better than the plain tablets available overseas. Insect repellent containing DEET 30% should be obtained in enough quantity to last one to two years.

Copies of original prescriptions should be obtained for all prescription drugs. Drugs that are vital should be obtained in quantity for many will not be available in the field. Do not depend on drugs being mailed to you for they are unlikely to get to you at all. Refer to the "Missionaries Medicine Chest" in the Appendix or to Chapter 5, "Arrival on the Mission Field" and buy all of the drugs and supplies that are listed. Be certain that they are all properly labeled in airtight containers and, if possible, in a single container.

Those individuals requiring special foods or nutritional supplement should get at least a six-month supply. It is helpful to make arrangements with someone to send you what drugs and special supplies you may need by other travelers and not depend on any form of mail service, for most items will be stolen.

If there is any significant disease, ask your doctor to prepare a detailed summary including all drugs and treatments for you to carry with you. Also make a list of your doctors' and pharmacists' telephone numbers and addresses and obtain an international telephone calling card so that in the event of illness you may be able to communicate with them.

Any medicines that are expensive or vitally necessary on a daily basis should be carried in your carry-on baggage rather than in checked luggage.

Some general recommendations: Take copies of your birth certificate, medical or nursing diplomas and licenses, take several copies of your passport pictures, documents from the country where you are going, with an invitation to come to that country, and documents that allow you to carry various materials. You may wish to take a certification for your camera if it is an expensive one to show that it originated in America.

Never let any of your documents out of your possession at any time except to give your passport to the passport officer. Even then keep it under observation. Avoid those at the airport who offer to clear your documents, get you a boarding pass, or any other service. This is usually illegal and you may lose your documents. Take sufficient funds with you in the form of cash and avoid traveler's checks – at least in Africa. Exchange only such funds that are needed at the time. One can always find a way of exchange at your destination. Do not carry or display large amounts of money where it can be seen. Unlike American and European air terminals, foreign terminals are generally unsafe. If you arrive too late to get a domestic flight and have to wait overnight, do not leave the airport unless you have made previous arrangements at a hotel and know where it is. If you need a taxi be sure to agree on the charge before entering the taxi and do not turn your luggage over to anyone except one porter that you have selected.

Assume that water at airports is unsafe and depend on bottled water which you carry or purchase bottled beverages.

All of the above may seem like overkill to the prospective missionary but is not. Detection of disease prior to travel may save your life and prevent a medical disaster in an area where there is little or no medical care available. We all know of many mishaps with passports and other documents and instances where travelers have lost large sums of money due to ignorance and carelessness. As previously stated, a sick missionary is a liability to himself or herself and to the mission work.


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Chapter 4

Intercultural-Interpersonal Communication on the Mission Field

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The Spiritual Component of Communication

Communication involves mutual stimulus and response. Communicators relate to each other in significant ways, share common experiences and ideas and mutual relationships. Communication implies sharing, including a dimension involving social relationships joined with ideas of fellowship and social ties.

Implicit in the Greek term *Koinonia* is mutuality and reciprocity. It involves both giving and taking. As one receives, he is obligated to give. Paul says (Romans 15:27) that sharing in another's spiritual blessings entails the necessity of sharing one's material possession.

Another critical idea embedded in the term *Koinonia* is the concept of inner relations. The behavior expressed by the formation of *Koinonia* (fellowship) springs from the internal relationship of the believer with Christ. Before one can have true fellowship with believers, he must first have union with Christ. The nature of one's relationship with Christ through his Spirit does not just reside within the individual. It pours out into the relationship with other believers. This is the wellspring of the reciprocal relationship involved in communication. The fellowship of the Spirit (II Corinthians 13:14 and Philippians 2:1) unites all believers, both to Christ and to each other simultaneously. "If we live by the Spirit, let us also walk by the Spirit. Let us not become boastful, challenging one another, envying one another." (Gal. 5:25,26) "For all of you are sons of God through faith in Christ Jesus for all of you who were baptized into Christ have clothed yourselves with Christ. There is neither Jew nor Greek, there is neither slave nor free man, there is neither male nor female; for you are all one in Christ Jesus." (Gal. 3:26-28)

On almost every page of the New Testament we can read of intercultural-interpersonal relationships that can help one to learn how to behave in our contacts with fellow workers and nationals on the field. We will establish and enhance these contacts as we are able to allow the "and of the Spirit" to control us rather than the "mind of the flesh." As Paul

admonishes us, ". . . walk by the Spirit, and you will not carry out the desire of the flesh. For the flesh sets its desire against the Spirit, and the Spirit against the flesh; for these are in opposition to one another, so that you may not do the things that you please." (Gal. 5:16,17)

The study of Scripture will keep us aware of the need to "bring every thought into captivity to the obedience of Christ." (II Cor. 10:5) The great commandment: "Thou shalt love the Lord thy God with all thy heart and a second like unto it, thou shalt love thy neighbor as thyself" leads naturally to the great commission: "Go ye into all the world and preach the Gospel to every creature, baptizing them into the name of the Father, Son and Holy Spirit, teaching them to observe all that I taught you and lo I am with you until the end of the world. The Christian, desiring to share his faith with others becomes a "Missionary." What he wishes to share is a message not of his own creation but one from the God of the universe who sent his Son Jesus Christ to die for fallen man.

The passage of Scripture in II Cor. 5:17-21 strengthens our sense of relationships in God, Christ, and the Christian person. "Therefore, if anyone is in Christ, he is a new creation; the old has gone, the new has come! All this is from God, who reconciled us to himself through Christ and gave us the ministry of reconciliation that God was reconciling the world to himself in Christ, not counting men's sins against them. And he has committed to us the message of reconciliation. We are therefore Christ's ambassadors, as though God were making his appeal through us. We implore you on Christ's behalf. Be reconciled to God. God made him who had no sin to be sin for us, so that in him we might become the righteousness of God."

Christian messengers must be led by the Spirit in order to *do* the work as ambassadors (messengers) of Christ. Paul instructs us: "You my brothers were called to be free. But do not use your freedom to indulge your sinful nature, rather, serve one another in love." The entire law is summed up in a single command: "Love your neighbor as yourself." If you keep on biting and devouring each other, watch out or you will be destroyed by each other.

So I say, live by the Spirit, and you will not gratify the desires of your sinful nature. For the sinful nature desires what is contrary to the Spirit, and the Spirit what is contrary to the sinful nature. They are in conflict with each other, so that you do not do what you want. But if you are led by the spirit, you are not under law.

The acts of the sinful nature are obvious: sexual immorality, impurity, and debauchery; idolatry and witchcraft, hatred, discord, jealousy, fits of rage, selfish ambition, dissensions, factious and envy; drunkenness, orgies and the like. I warn you as I did before that those who live like this will not inherit the kingdom of God.

"But the fruit of the spirit is love, joy, peace, patience, kindness, goodness, faithfulness, gentleness, and self control. Against such things there is no law. Those who belong to Christ Jesus have crucified their sinful nature with its passions and desires. Since we live by the Spirit let us keep in step with the Spirit. Let us not become conceited, provoking and envying each other." (Gal. 5:13-26)

The Christian who would win others must be under the guidance of Christ through the Holy Spirit. We must be the examples of Christian behavior that we would teach others to become through submission to Christ.

Intercultural Communication

Any individual, couple or family who plan to enter a new culture should avail themselves of a good course in Interpersonal Intercultural communication using a good textbook. Some of these books will be listed at the end of this chapter.

Recognizing the need for study.

When young individuals and families move from one culture into another they will inevitably experience a need to understand and adapt to differences between the two cultures. In their efforts to communicate with individuals in the new culture, they will find that their previous experience is inadequate to provide necessary clues to comprehension of the new culture.

Understanding various aspects of the new culture is a prerequisite to developing good intercultural and interpersonal communication skills. Whether you live in Kansas City or in Burundi or in any place culturally different from that of your birthplace you will encounter various cultures that have to be dealt with before effective intercultural communication can occur. This paper will first present aspects of intercultural communication necessary to be understood if one wishes to develop good interpersonal communication, aspects of which will be the second concern of this paper. There no doubt will be special consideration of both areas that will concern the Christian as a communicator since we are ambassadors of Christ.

Within all cultures there are subcultures which require to be taken into account in order to define the entire culture in a comprehensive fashion. These factors include race, religion, geography, economy, language, ethnic origins, and age differences. Other factors may influence how we talk to other people, how they feel about themselves, and how successful they are in dealing with one from a different subculture. Among factors of the subculture with which one must deal are social class, education, group membership, rural-urban, regional (geographical) perceptions (Southern, Eastern, Western, etc.), male-female, interracial, etc.

Carley H. Dodd's book *(Dynamics of Intercultural Communication,* 2nd Ed. 1987) says that "Research in intercultural communication has revealed eight axioms or basic assumptions about intercultural relationships and interactions (p. 26)." These eight axioms are paraphrased in the following paragraphs.

1. Differences between cultures exist. People do not immediately share norms, thought patterns, structures, and systems. Differences may become positive motivation to create skills to work through and overcome misunderstanding and poor communication. We must recognize differences as resources.
2. The person with whom we are communicating affects how the message is interpreted. Messages alter relationships. For example, we probably feel friendlier toward a co-worker who compliments us than toward someone who constantly criticizes.
3. A communicator's style affects intercultural communication. Some people have a dominant and some people a submissive style. Some are warm and caring; Others are cold and unfeeling. Other styles may be characterized as being friendly, being a mediator, a counselor, a critic, question asker, opinion giver, and so on.
4. There is always some ambiguity and uncertainty in our relationships with other people. Greetings and leave-takings have their accepted cultural rules which help us to feel comfortable in relationships. Interaction with someone of a different culture, however, means that we do not necessarily share the same communication rules. Thus, the ambiguity-uncertainty increases dramatically.
5. Cultures inherently contain communication systems. Communication and culture are inseparable. Cultures have communication styles that are typical of that culture. In some cultures, interpersonal communication is marked by flowery language, numerous compliments and profuse thanks. Other cultures are marked by friendly and warm style. Americans are often regarded as informal, uninhibited, confident, and loud. Britons may be reserved, understated, and controlled in their style.
6. Intercultural effectiveness involves intercultural communication success as a goal: improved relationships, effective management, friendship, training, conflict reduction, and sharing of technical information. Intercultural success is based upon a cultural awareness model that "task needs" and "people needs" work together.
7. Intercultural communication is successful in proportion to our ability to adjust to new cultural environments. A number of methods of modifying culture shock and adjustment have been identified and will be enumerated later in the chapter.

8. You may utilize certain suggestions for improving your skills in processing intercultural challenges. Examine your assumptions behind your ideas. Reasoning, looking for facts, analyzing facts, synthesizing, and offering critiques are important skills in intercultural communication.

In intercultural communication we must explain our meanings in more than one way. Describing our feelings, thoughts, and behaviors in more than one way can help to improve our skills.

Become a "people person" as well as a person capable of performing tasks.

Practice linking persons who have not met. By simple introductions, emphasis on their commonalities, we can serve an important liaison role. Practice building relationships. When we recognize cultural differences, we may create in ourselves a desire to understand those differences and to communicate effectively with those from differing cultures.

Learning to appreciate unique features of cultures to which one is newly exposed can help one to recognize and to adjust to these differences and co-communicate with representatives of the new culture.

Certain elements common to all cultures have been identified (Dodd, p. 40). Among these elements are the history and personality of the culture.

The different roles played by material elements of the culture are usually very noticeable. Food, water, clothing, housing, health, and technology often demand our attention and may cause us to overlook interpersonal behaviors, language, artistic expressions, etc.

Nonverbal elements of a culture are also prominent features which affect intercultural communication. Facial expression, gestures, touch, and eye movements are important elements of communication which, when misinterpreted, can cause significant breakdowns in intercultural communication.

The assumption of an attitude of superiority of one culture over another is also a source of potential intercultural communication conflict. Ethnocentrism has led to wars, conflict between urban and rural culture, and other negative behaviors.

Other important elements of intercultural communication systems have been identified (Dodd, pp. 37-62) and should be studied by the serious students.

We may assume that all wish to be better performers in intercultural contexts. The following strategies may help us add to our skills and to our understanding of the principles already discussed (Dodd, pp. 236-7).

How can you perform better in intercultural contexts? Perhaps the strategies that follow will add more skills to your understanding of the principles already introduced in this chapter.

1. Work to emphasize areas of similarity with others. To the extent that you can, underscore commonality, generally the better the interpersonal relationship.
2. Try to accept differing opinions. In this way, you can remain open and receptive. Dogmatism has a way of blocking intercultural communication.
3. Make your verbal messages consistent with your nonverbal messages. Listen to yourself and try to see yourself talk. Discrepancies between the verbal and nonverbal send a mixed message that in the long run discredits you.
4. Avoid dominating conversations. Listen to how much time you spend communicating while in a group. You may be dominating others in the group, and it may not be long before they find you a bore. Listening to others, inviting their explanations, and showing genuine interest are communication suggestions.
5. Avoid being submissive in conversations. Although domination can prove to be harmful, if you are overly submissive, people may decide that you have nothing to contribute, a condition that leads to intercultural relationship demise.
6. Be an affirmer. You do not have to be a back slapper or act obsequiously to be confirming in your communication behavior. Your intercultural counterparts will appreciate your attempts at being understanding rather than critical.
7. Practice communication clarity and conflict resolution. Consider these brief examples as potential beginning points for better intercultural effectiveness:

Condition	Sample response
Need for clarity	"Did I understand you correctly, Hassan, when you said_____?"
Certainty that message was understood	"Would you mind going over that in your own words and let's see if we're thinking the same thing."
Conflict	"Thu, I wouldn't upset you for the world." (As Thu speaks, listen carefully and be willing to respond positively toward the person, despite any disagreement over the issue.) "I think I see what you mean. Let's see if we can work this out. Perhaps there's another viewpoint we haven't considered."

Communicator Credibility

In order for our messages to be believed we must be seen as credible sources. Studies have identified a dramatic relationship between communication sources and receivers which causes listeners to believe or disbelieve a message.

Five categories are generally recognized as elements of communications credibility. These are authority, trust, co-orientation, charisma, and dynamism. Dodd (pp. 258-266) has defined these qualities:

1. Authority refers to such adjectives as reliable, informal, qualified, intelligent, valuable, and expert.
2. Trustworthiness is identified as honesty, unselfishness, virtuousness, and character. To the extent that we see that a speaker is trustworthy, we tend to see that speaker as credible.
3. Co-orientation is the identification of those with whom we communicate as having similar values, goals, and group loyalties. Thus, establishing identification with a person or group from another culture, makes a significant step in effective intercultural communication. When we create a perception of co-orientation with our new cultural contacts, we form an intercultural bridge between two cultures.
4. Charisma is a type of leadership arising from a leader's power to use special gifts to solve problems. Charismatic leadership relies upon a foundation of perceived power in the leader.
5. Dynamism or enthusiasm or personal involvement, is another aspect of charisma. Dynamism may be described as a communicator's aggressiveness, activity, and energy.

These five factors strongly affect the believability of the communicator. He will do well to consider his message in light of these communication variables.

Interpersonal Communication

The following ideas from a paper by Dr. Patrick Garner given to the Speech Communication Association in Miami, Nov. 1993, will serve as an introduction to some basic assumptions about the basic nature and importance of interpersonal communication.

In the Latin translation of the New Testament, the concept of mutual sharing is embodied in this family of words from which our English term *communication* has its origins. The Greek equivalent of this Latin family is represented by *koinos* and its derivatives. For example, in I Corinthians 10:16 when Paul is discussing the nature of idol feasts as contrasted with the Eucharist, he says, "Is not the cup of thanksgiving for which we give thanks a *communicatio* in the blood of Christ?" This term is translated in

the Greek as *koinonia.* The concept of *koinos* is not one that is strong in the Old Testament writings. But the idea is expressed in the notion of the common property and in that which is held to be "common" rather than sacred. In the New Testament, *koinos* is used to express the common religious bond among members of the early church that led them to forego their rights of ownership (Hauck, 1967). In order to grasp the nuances of this varied concept, consider the several variations of this root term used in the New Testament.

The group of Greek terms represented by the term *koinonia* are used mainly by Paul in Ephesians, I Timothy, and I and II Peter. The three other forms of *koinos* that are of significance are *koinoneo, koinonia, koinonos.* All of these terms can be defined in noun form with such synonyms as common, partner, companion, fellowship, participation, community or their verbal phrase equivalents (Hainz, 1981). Two critical communication concepts can be gleaned from this word group. First, implicit in the notion of *koinonia* is mutuality. The relationships expressed by this term demands reciprocity. It involves both giving and taking. If one gives, he is able to receive. If one receives, he becomes obligated to give. This fellowship or partnership is expressed in the New Testament in the relationship between the Jerusalem church and outlying churches and in the relationships between a teacher and the one taught (Hainz, 1981). Paul's statement in Galatians 6:6 embodies this concept, "Anyone who receives instruction in the word must share all good things with his instructor." Paul also extrapolated this *koinonia* to the churches he established as they shared in his support spiritually and financially (Philippians 4:15). He also says that the sharing in another's spiritual blessings entails the necessity of sharing physical possessions (Romans 15:27). So the development of *communicatio* or *koinonia* involves the same type of mutuality or reciprocity implicit in modern notions of true communication.

A second critical idea embedded in the term *koinonia* is the notion of inner relations (Hauck, 1967). The behavior expressed by the formation of fellowship (*koinonia*) springs not from a sense of legal obligation, even though this term has its roots in this area. Rather, it grows out of the internal relationship of the believer with Christ. Before one can have true fellowship with believers, he must first have union with Christ. Paul also notes that as believers share in the essence of Christ, they will also share in his suffering (Philippians 3:10). And Peter adds that they will also share in his glory (II Peter 5:1). But the nature of this relationship with Christ through his spirit does not just reside within the individual. It pours out into interrelationships with other believers. This is the wellspring of the reciprocity mentioned above. The fellowship of the spirit (II Corinthians 13:14 and Philippians 2:1) unites all believers to both Christ and each other simultaneously. This is the inner relationship that serves as the foundation of the internal *koinonia-*

communicatio which further manifests itself in the external acts of fellowship known in more modern parlance as communication. And from this spiritual base spring the communication behaviors associated with acts of kindness and fellowship in the church throughout history.

Thus to the Christian there are "inner relations" that result in outward expressions in communication experiences and expressions.

As humans we generally have learned to aspire to achieve satisfactory relationships with other human beings. There is an increased need for a sense of personal justice. Other persons have the right to be heard, not just a need to be informed, inspired, or persuaded. All of the transactions we engage in have certain elements in common. We may be a sender of a message, a receiver of a message, or both a sender and a receiver at once. Our messages may be verbal or nonverbal. We usually think first of the messages as verbal. Words mean different things to different people. Words depend on their meaning from the experiences, reactions, feelings, and contexts of those who use them. Messages have effects, mental, physical, or emotional. Even silence is an effect.

Interpersonal communication may be distinguished from other types of communication.

It usually invokes two or three persons. It may occur within a larger group. It involves feedback. It doesn't always involve words, nonverbal messages include facial expressions, posture, gestures, voice inflections, etc.

Physical circumstances affect our communication in various ways. Each situation has its own set of variables which determine the emotional response which may be friendly and warm or cold, hostile or tense.

Those who have chosen to associate themselves with a group of people on a mission field have inevitably chosen to learn interpersonal skills that will strongly affect the effectiveness of the goals of the mission. Interpersonal relationships in families or among two or three persons on the team may make for success or failure of those individuals' efforts and of the general effectiveness of the team.

All of us have ample reason to improve our skills in interpersonal communication. We should actively reach out for new relationships rather than shy away from them. Relationships within families will be different because of the challenges of new living quarters, new foods, new associations, new cultural challenges, etc.

Expect the challenge to grow into new relationships. Different social settings make new demands upon us. Work relationships, traveling, shopping, eating, worshiping, all can help us to understand feelings and motivations that can help us to build relationships patiently. Discuss how communication is developing.

Develop openness to change, which is an inevitable demand upon those who are involved in a new culture. Be receptive to what is going on around you. Develop sensitivity to small details that affect your family and associates.

Try to improve the accuracy of your communication. This is a skill that can be developed. Try to detect when meaning is being distorted among those with whom you are talking. Take corrective measures to be sure your message is understood the way you meant it.

The development of our concept of self (who I am) is a starting point for improving interpersonal skills. I need to learn the importance of disclosing that self to others. All of us have an idea about how intelligent, attractive, and successful we are. We get these ideas from interactions and feedback from our family, our social contacts, and our professional associates. Some of our beliefs about ourselves are realistic, but some are wishes about what we would like to be rather than what we actually are. The self concept is developed over a long period of time. Friends, family, and associates reinforce our feelings about ourselves.

If you have a positive self-concept, you can accept as normal, your negative feelings and behaviors. Undesirable traits can be changed. No one has totally negative or positive self concepts. It would be desirable for all of us to be aware of negative self concepts and to be able to change them to positive ones.

Another aspect of interpersonal communication is the need and ability to disclose ourselves to others. Allowing others to see ourselves as we really are, can be a very satisfying experience. They need not, but may, be intimate disclosures. We don't want to share feelings with those we don't trust. Trust is usually the basis for self-disclosure.

To engage in self disclosure is the key to discovering yourself. To engage in productive worthwhile self-disclosure requires interaction with other people.

Anticipating and Coping with Interpersonal Conflict

Even healthy interpersonal communication is not conflict free. It may be constructive or destructive. Chances are that it is inevitable so we should manage it in order to get the maximum benefit.

Culture shock may make interpersonal conflict on the field inevitable. Observers have discovered some common stages of culture shock. The euphoric stage, or honeymoon stage, sees everything as lovely and delightful and may last from two weeks to six months when it turns into the "everything is awful" stage. This may last from a few weeks to several months. It may be a reaction to poor transportation, difficult shopping, bargaining devaluation of the dollar, or different or unavailable food.

Expatriates may cope in four ways (1) fight, (2) flight, (3) filter, (4) flex. The fighting mode will cause one to reject expatriates as inferior, thus decreasing contact with nationals. If flight is our response, we decide to return home, withdraw from the new culture, avoid learning and speaking the new language, and avoiding all contact with nationals. We may decide to use various filters: We deny the reality of differences. "They are just like us." We may glorify home, forgetting its imperfections, or we may go native, attempting to adopt all aspects of the national culture: drink their water, avoid using malaria prophylaxis, etc. We should learn early on that we will never totally assimilate their culture. Lastly, we can learn to be flexible in trying to understand their culture, try new things, new foods, etc.

The last stage is the "everything is okay" stage in which we view their culture from both negative and positive viewpoints in a balanced manner.

It has become a truism that the most common and most difficult problems on the mission field is conflict with other missionaries. This conflict is the result of poor interpersonal communication.

Openness, cooperation, and empathy are at the center of success in communication. Conflict arises when we attempt to change the attitudes of others. Even Christians, yes even Christian missionaries, face a certain amount of unpleasantness, hostility, defensiveness, egocentrism, stubbornness, and other types of anti-Christian behaviors in our relationships.

What do we do about our interpersonal conflicts?

We can try to ignore them.

We can deny that they exist.

We can accept them as inevitable parts of life.

We can allow our mission to crash and return home.

We can provoke others to return, causing their mission to crash.

We can learn to cope with them.

Improving Skills

(No guarantees they will work or that we can always choose how to handle them)

1. Define the conflict—narrow the cause of the conflict; be specific; identify the cause, its size, its type.
2. View the conflict as a joint problem. You can view it as "win-or-lose" or as a joint problem. The admonition in scripture to "go to the other person" sees the conflict not as "win-lose" but as a joint problem.
3. State the problem. "When you criticize me publicly I get angry. When you dominate the conversation, I feel put down. When you don't consult me on decisions, I feel rejected." Thus we take responsibility for our feelings by using "I" language rather than "you" language.

4. Check your perceptions. Was our message received accurately or misunderstood, misquoted, misinterpreted? Paraphrase the other person's responses before answering, "Do I understand you to say _____?"
5. Generate possible solutions. What is needed; what can I do; what can you do; what can we do together; a joint cooperative solution is more likely to work.
6. Reach a mutually acceptable solution. It won't be totally satisfactory to everyone; need for cooperative interaction; how it will require us to work together. Be sure everyone understands what was agreed on by paraphrasing and summarizing the solution. If no agreement is reached, STOP; try again later; get away from the problem for awhile; gain new insights.

We act best when we are well informed. Find out all we can about the problem—to realize that there usually is more than one way to solve a problem.

Problems with information may develop in three ways:

1. Communication overload. Trying to listen to a classroom lecture when we have just heard some upsetting news. Our emotional responses won't allow us to comprehend a new "load" of information.
2. Manipulative communication. Communication breakdown may occur when we feel that information is being offered to manipulate us—with the intent of using or controlling us.
3. Ambiguous communication resulting from too little communication—too abstract.

An approach for managing stressful conflict will put a high priority on coping creatively and maintaining a favorable view of self. We can work to improve our interpersonal communication skills, but the only guarantees that they will work come from submission to Christ and to one another. Some practical steps toward solutions are suggested in this paper.

Solving interpersonal communication conflicts is basically a case of problem solving.

The problem can be solved if we are willing to confront the problem, pray fervently, and work cooperatively for a solution—not my solution or your solution—but the best solution considering all of the best information.

Sources and Additional Reading

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I TAKE IT POWER FAILURE IS COMMON...
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Chapter 5

Arrival on the Mission Field

Henry Farrar, MD
Lebanon, Tennessee

Driving a Land Rover from Chimala to Mbeya in Tanzania, a visiting medical student exclaimed, "There are no warnings about terrible road conditions!" True, there do not seem to be any warnings about road hazards or for any hazards. Barriers to keep you from driving into road construction are not soft—they are often big concrete blocks. In the good ole USA, we have learned to expect warnings of danger. In the Third World, you must watch out for dangers for yourself. This applies to health hazards and road hazards as well. Nothing is more *apropos* for a person visiting a mission field than Jesus' advice, "Watch and pray."

Before I went to Nigeria in 1964, the U.S. Government, missionaries on the field, and Pan American Airways all warned me about malaria. In fact, as our Pan Am jet landed at each airport in West Africa they sprayed the plane for mosquitos and told us again about the dangers of malaria where I was landing and even offered me Chloroquine tablets. When I arrived back in the States, I was given a paper telling me what to do in case of chills, fever, and rashes. The missionaries who met me at the airport told me how to avoid insect, water and food borne diseases. At this writing, the United States Department of Transportation has a sign in all US airports warning that security precautions in the Third World are not satisfactory. They started putting up those signs in about 1990. We laughed a bit, because nobody had ever said that security was satisfactory at any time.

Rule #1. Watch and pray. Keep your eyes open to the world and your heart to God.

"Lord, be with the Travelers."

When we arrived in Africa, it seemed that those words were included in every Nigerian prayer. After we had traveled about some, we could see why. There are no wreckers if your car breaks down. On an especially bumpy road near Makurdi in 1972, we broke a rear axle. I rode into town in a big truck, a distance of about ten miles. We were lucky to find a mechanic who had a used rear axle with a universal joint. He and two helpers went out and took off the broken one and put on the used, but unbroken one. They did it all by kerosene lantern light out there, and drove it to us. The next day, they took the axle off. The owner of the axle demanded an outrageous price to

put it back on. We left the car there, and Grace, our three children and I hired a big truck to take us three hundred miles home. Our driver, Friday, went back to Makurdi with the parts to get the car fixed and drove it back to us three weeks later.

Camping to and from Yosemite National Park, Grace, the children and I stopped at Reno, Nevada where we worshiped on a Sunday morning. I guess we looked a bit bedraggled. We had been sleeping in a tent. A wonderful African-American preacher prayed for us, "Father, be with Brother Farrar and his family. May they be delivered from wicked and evil men, for not everyone has faith."

That scriptural prayer from II Thessalonians 3:2 was one I seemingly had not realized was there. I have prayed it often since then.

Run Without Undue Regard to Personal Safety

When Jesus commissioned His Apostles to go into *all the world*, he did pre-answer their fears about personal safety. There is a natural fear of strange, foreign places. "I will be with you always even to the end of the world." Knowing that Jesus is right there with me helps. Fearing to run the Christian race because I am afraid of what might happen to me personally could keep me from obeying the great commission. The early Christians took risks when they obeyed Jesus Christ. I must take risks for Jesus. And, by the way, there is no risk-free place on earth.

While I am willing to risk personal safety to share the gospel with those who do not have it; I should *not* take undue risk. We speak of a calculated risk. Paul said, "I reckon that the sufferings of this present time are not worthy to be compared with the glory which shall be revealed in us." (Romans 8:18) Note the word "reckon." NIV uses the word "consider." He carefully thought about it. Serving Jesus in dangerous places is necessary at times. Can I sing, "Anywhere with Jesus I can safely go!"

The pell-mell, uninhibited, single-purpose-in-mind attitude of the race runner is the picture the Bible gives of running the race of the Christian life. See Hebrews 12:1-4.

Rule #2. Calculate, reckon and consider the risks.

Malaria (Latin for "Bad Air")

If you get this disease, which is hyper-endemic in many Third World countries, you will appreciate the Latin name. There is little reason to suffer this disease if you are careful to use anti-mosquito measures like nets, repellents, staying inside houses with screened windows at night, and taking anti-malaria medicine. The malarial mosquitos do their dirty work after the sun goes down, resting near the ceiling until 7-10pm when they come down to get your blood.

When I go for night rounds at the hospital, I like to liberally use insect repellent on exposed skin surfaces. I have seen experienced missionaries neglect simple anti-malaria precautions and get malaria. It is not often a fatal mistake, but it does make them awfully tired! These daring brethren are a bad influence on new workers, who have no immunity and may get a very debilitating and scary disease.

Malaria and intestinal infections are typical of diseases in the Third World that one can eliminate by being careful. It is kind of like smoking cigarettes or eating high fat foods in America. I am amazed to see people in the USA throw caution to the winds because they like to smoke or eat very fat foods. Fortunately, there is good medical care at home to bail out these risk-takers. In the Third World your risk taking to be "indigenous" is not as trouble free where medical care is not as available to rescue you.

I will not be a wimp and refuse to go out at night because the "mosquitos might get me," or refuse to eat offered food. I use my repellent and go out if necessary. I choose something well cooked from the offered food, or ask for a banana or an orange still in their nice yellow or orange skins, which are excellent germ barriers.

Rule #3. Do not dare the mosquitos or your intestine.

"Good morning" not "Give me"

Third world country etiquette *requires* me to recognize as a person the person I am speaking to with a greeting. It's not like the US where I meet someone and he expects me to state my business or my request without a "Good morning!" At the post office or at a service window, I have to show my friendliness first then make a request. No matter how busy I am, I must not try to get away quick. These people think Americans are trying to run over them or treat them as unimportant. They are right. If we think a person is important then we will want to spend time with them – not rush away.

Hotel soap, religious tracts, ball-point pens or small New Testaments are nice ice-breaking gifts. I like to carry a small 2 x 3 inch zip-lock bag with ecotrin tablets to give away for headaches. People you meet on the road are potential Christians! Give them a little time and friendliness. The American obsession with speed will not make friends, and you can't get nationals to help you if you try to rush them.

Rule #4. We always say "Please" and "Thank you" and "Good morning."

Paper, Soap and Iodine

When traveling, soap and toilet paper may not be readily available so you may wish to keep some with you at all times. A wash cloth is not bad to have either. In a restaurant with questionable water, I can make it safe to

drink by putting a few drops of aqueous iodine or a halazone tablet in my glass and waiting a couple of minutes for the water to become iodinated or chlorinated. Hotel tap water is not usually intended for drinking or tooth washing.
Rule #5. Tiny hygienic needs are nice to stop heat and dirt.

Negotiation, Money, Documents

The price of anything in the Third World varies and I hardly ever think that the "asking price" will be the "final price." Before I get in a taxi, I ask, "How much to the Domestic Airport?" The reply of the driver is usually three times what he expects you to pay and will negotiate the final price somewhere in between. *After* the price is agreed upon, I will get in the taxi.

Do not exchange money with con artists or touts on the street. Changing your dollars into local money is legal only in a bank or hotel. If possible, have a missionary meet you at the airport and take you to the best place to exchange money.

I do not give up my passport except where it is required. I try to always have a copy of the first pages of my passport and visa in a different place in case the passport is lost. Losing a passport may cause real problems. Whenever I move from one location to another, I check for the "big four"—Money, passport, plane ticket, and immunization certificate. I feel for the four whenever I leave one place and arrive at another.

My real passport is my Christianity—you know, that smile and *confidence*. With God right there with me, I have nothing to fear. Smiling confidence opens doors. Excessive timidity may make me a target for a con artist. When I try to make friends of all I meet, they feel that I like them and this may help them like me. When my anger and impatience have come over me, I have always had trouble. No, anger is not sin, but it is close to it, for the anger of men does not work the righteousness of God. This is not a sermon to you. I am telling you my bad experience. My anger and impatience have caused me much trouble. I am thankful that God has bailed me out.
Rule #6. Friendly persuasion is better than anger, impatience, and losing my cool.

A Fool for a Doctor – A Fool for a Patient

In general I do believe Dr. Sir William Osler who said, "The physician who treats himself has a fool for a doctor and a fool for a patient." Surely this is more true in Montreal or Baltimore than in a Third World country. *Before* the missionary or doctor goes to the Third World, he should have himself examined, as well as his family, by medical colleagues. Undoubtedly, psychological testing and advice are also of great value.

From observing missionary physicians and surgeons, I have seen and read

of "burnout." I think this means that excessive work loads and stress effect the emotional life of the doctors. It makes them moody, soon angry, depressed and ready to quit. Just think how hard it is to recruit doctors and nurses for missions. Steps must be taken to avoid their burning out! If doctors in America take a day off each week and a vacation every year, overworked missionary doctors and nurses need such rest more. Tired doctors are more angry, impatient, make more mistakes and have more difficulty exemplifying the life of Christ.
Rule #7. Missionaries need daily naps, weekly days off and a vacation each year. A medical meeting should also be attended each year.

A Missionary Doctor's Formulary for West Africa

Drugs we are able to get at a moment's notice may not be obtainable at all in the mission field. Some of the drugs purchased in these countries are impotent and are usually extremely high priced. See also list on page 213.

Triple antibiotic ointment for skin infections and minor injuries.
Insect repellent with "DEET" and Permethrin
Hydrocortisone 1% cream for anything that itches
Lotrimin drops for fungus and yeast infections
Cornstarch (cooking starch) in place of talcum powder
Benadryl capsules, or better, Claritin (antihistamine)
Enteric coated aspirin tablets and Acetaminophen 250 mg tablets
Lomotil and/or Imodium for diarrhea
Cortosporin eye drops and Non-steroidal eye drops
Diflucan tablets
Ventolin inhalers
Pyrimethamine tablets (one a week)
Quinine capsules
Chloroquine or Aralen tablets
Paludrine tablets (usually available)
Fansidar tablets for resistant malaria
Trimethoprim/sulfa (Septra - Bactrim - Septrim)
Tetracycline and/or vibramycin
Flagyl (metronidazole) tablets for amebiasis or giardiasis
Vermox - for hookworm or ascariasis
Nitroglycerine tablets .4 mg for angina pectoris
Lanoxin (digoxin) for cardiac failure
Lasix for cardiac failure
Amoxicillin 250 mg capsule for typhoid and salmonella infections
Phenergan injection for nausea
Epinephrin injection for allergic reactions,
anaphylaxis or intractable asthma.


I'M A SURGEON, WHAT AM I DOING PUTTING ON BANDAIDS?
skypt 97

Chapter 6

Culture Shock and Becoming Involved in an Alien Culture

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Introduction

Much scholarly research has been done on the subject of culture shock in recent years, and volumes have been written on the subject. It is the author's intent in this chapter to present an overview of some of the available subject matter in order to sufficiently familiarize prospective missionaries with what, in most cases, happens when one moves from one's own familiar culture into an unfamiliar one. It is hoped that this cursory handling of the material will be of practical use to the reader in identifying the symptoms and in coping with the inevitable when it comes.

Culture

Each society acquires its own set of rules, regulations, attitudes and values that govern its behavior. This becomes its culture. There are millions of these behavioral rules, regulations, attitudes and values which accrue from birth to create the culture in any given society. These rules, regulations, attitudes and values become so ingrained in our minds, and become so much a part of our way of thinking, that we actually do not realize that we are depending upon them to make all of our judgments, decisions and choices. Cultures vary in insignificant ways even from family to family, somewhat more in ethnic and racial groups and from region to region within the boundaries of one's own country. When, however, we cross into other societies, especially across linguistic and geographic boundaries, we find a totally different culture. Moving into such a culture usually leaves us disoriented, confused and without the familiar rules and regulations (props) upon which to lean.

L. Robert Kohls defines culture as follows:

> Culture = an integrated system of learned behavior patterns that are characteristic of the members of any given society. Culture refers to the total way of life of particular groups of people. It includes everything that a group of people thinks, says, does, and makes – its customs, language, material artifacts, and shared systems of attitudes and feelings. Culture is learned and transmitted from generation to generation.[1]

Culture Shock

Christians tend to assume that if they go to the mission field, things will be different for them. After all, they are going to do the Lord's work and He will take care of them. Although it is true that He has promised to be with us, even to the end of the ages, it is naive to think that we will be exempt from all disorientation, confusion, loneliness, and feelings of alienation when we cannot speak the language or from strange reactions to our set of rules and regulations, values and beliefs. Culture shock is inevitable, and every missionary needs to be aware of it and be prepared to recognize it when it occurs. It does not come suddenly but usually builds up gradually from a series of events. Often the victim, if not aware of what is happening, will become bitter and hostile, will withdraw, feeling a deep sense of frustration, even guilt and failure, and in extreme cases, will pack up and return home. Most missionaries do eventually adjust and overcome, especially as they begin to understand and accept the new culture and the host language.

Anthropologist Kalvero Oberg first coined the term "culture shock" in 1960 when he wrote:

> Culture shock is precipitated by the anxiety that results from losing all our familiar signs and symbols of social intercourse. These signs or cues include the thousand and one ways in which we orient ourselves to the situations of daily life: when to shake hands and what to say when we meet people, when and how to give tips, how to give orders to servants, how to make purchases, when to accept and when to refuse invitations, when to take statements seriously and when not. . . .These cues, which may be words, gestures, facial expressions, customs, or norms are acquired by all of us in the course of growing up and are as much a part of our culture as the language we speak or the beliefs we accept.[2]

Being Aware

Being intellectually informed about culture shock does not necessarily minimize the impact that it has upon one. Travis Collins, of the Foreign Mission Board of the Southern Baptist Convention, tells of how he studied every angle of culture shock while in seminary and in training to become a missionary. When he arrived in Nigeria, however, there was a lack of water and electricity in the house in which he lived, his 3-year-old daughter contracted malaria almost immediately; a terrible itchy rash covered his little 10-month-old son's body, language learning was difficult and these trials, together with the newness of the culture "nearly propelled me past culture shock to culture electrocution."[3]

Being aware that culture shock is likely to strike may keep one from becoming bewildered, or from thinking that one is going out of one's mind. A missionary friend of ours in Germany had her child in a snack bar in a department store. She was having difficulty persuading him to eat his food and he was becoming irritable. To her chagrin a typical elderly German woman walked over and handed him some "bon-bons" (candy), which is not unusual at all in Germany. This, of course, defeated all of our friend's efforts to persuade him to eat, and upset her greatly. She was so angry with the lady, was on the verge of crying, and in her frustration, grabbed the son and stormed out of the snack bar. After regaining her composure, she thought—"Oh, this is what we studied, I am experiencing culture shock!" She knew, intellectually, what was happening and this realization helped her to cope with the situation after the initial reaction.

The Tendency

Our own culture is so much a part of us that we tend to think that our way is the only right way. Our tendency is to feel that everyone should accept our set of rules and regulations and our values. When they do not, then we will likely have a reaction. Our first reaction may come when the customs official looks through our suitcase with curiosity and then, without shame, asks, "and what do you have for me?" We know that this is wrong, it is not our way of doing things, they should be more professional, they are dishonest and inefficient. They should know that there is a better way to do things. Obviously we are immediately judging things from *our own set of rights and wrong,* from our own accepted ways of doing things. This is a typical reaction, but when such things, including requests for "bribes" persist, we tend to become angry. Our anger becomes evident, and often arouses resentment on the part of the official, who then makes it even more difficult for us to get through customs. As experiences like this build up, culture shock begins to set in.

The Honeymoon Stage

The missionary is usually filled with anticipation upon entering the new mission field. Things are novel and interesting and there is a sense of excitement. This has been described by scholars as *the honeymoon stage.* After a while the new wears off, and reality sets in. It soon becomes obvious that this is a totally alien culture to the one the missionary has been accustomed to. Often, in the case of married couples, the wife becomes more quickly disoriented and frustrated than the husband, especially if she has children and has to stay at home while the husband is out learning the language and is among other people all day. In case after case the

family has had to return home prematurely, because the wife suddenly developed some strange, imagined, or sometimes very real emotionally imposed illness.

The High Cost of Unpreparedness

Having been involved in missions since 1958, I could tell of a number of personal acquaintances who went to the mission field at a tremendous cost to the sponsoring congregation and supporting friends, but who, within a few weeks or months on the field, had to return home. In most of these cases the illness, whether real or imagined, could in all probability have been traced to the emotional state of the wife. If the couple had been trained to at least recognize the characteristics and the dynamics of culture shock, this great loss may have been averted. The psychological costs are also great. The family often feels a sense of failure and defeat. A sense of shame may make them feel uncomfortable and unaccepted even by their friends. This is where counseling may be essential in order for them to recover and properly reenter their own society.

Now that we have defined culture and have discussed the nature of culture shock, let us look at some of the things which can be done to help prepare missionaries for the transition from their own culture to another.

Avoiding the New Culture

Obviously, measures can be taken to prepare one for entering another culture and to lessen the impact of what we have called the inevitable, when it occurs. Moving from one's own culture into a new and strange one has been taking place since the early history of mankind. Most people have found ways to adjust, often avoiding the new culture by hanging on to their own and isolating themselves into clusters of their own ethnic groups. Sometimes it takes years for these groups to integrate into the new society, because they can always retreat into their own culture. We have seen this in the United States in our many diverse ethnic communities, such as the Chinatowns, the old German communities, Filipino communities, and in many other ethnic groupings.

Missionaries have often done this very thing by creating walled compounds and living within their own culture, venturing out to teach and preach, but keeping their distance from the actual host culture. While this may lessen the impact of culture shock, it may also lessen to a large degree the effectiveness of the missionary among the people of the target culture. Living in compounds may, in some cases, be necessary, but this should not serve as an excuse not to learn all that one can about the host culture and making other necessary preparations before departing one's homeland.

Knowing One's Own Culture

In order to prepare to enter a new culture, one must become aware of one's own culture. It is not always easy to objectively describe one's own culture, much less to analyze it and understand it. There are some components, however, that are obvious when called to our attention. L. Robert Kohls makes a number of generalizations about culture which may help us to look at our own more closely and objectively. I will abbreviate some of these. He says:

1. By definition, to be "human" means to be part of a culture. It is impossible to conceive of Man (human being) outside of culture. Man creates culture and culture creates Man.
2. Most cultures developed separately, in isolation, over many years. The ways which eventually were adapted were based primarily on the ability of each element in the culture to contribute to the physical and psychological survival of the group.
3. The culture of any group represents an extremely complex and interrelated package where every aspect is interwoven and intermeshed with all other aspects.
4. Every society, in developing its own culture, must meet the needs of the group in at least these ten basic areas: food, clothing, shelter, family organization, social organization, government, defense, arts/crafts, knowledge/science, and religion. The first three items on this list are generally recognized as the "necessities of life." This is true if we are thinking of individuals. If we speak of society as a whole, however, the last seven items may be seen as equally "necessary" to maintain culture.
5. It is highly likely that different groups will come up with different sets of solutions to these ten basic needs.
6. There are no intrinsically "right" or "wrong" solutions, no objectively provable "better" or "worse" ways of meeting these needs. For practical purposes, there are only different solutions. This is a key point and a very complex issue.

   We are not advocating ethical or moral neutrality. Approval of such practices as head shrinking, human sacrifice or cannibalism is not required or even recommended in order to recognize that there is an *inherent logic* in every culture. The role of any value or behavior makes remarkably good sense to those within a culture. To understand different values and behaviors, it is useful to approach them non-judgmentally, searching for that which is inherently logical rather than automatically either condemning or accepting them.

7. An equally key point is that every group of people, every culture, is, and has always been, ethnocentric, that is, it thinks its own solutions are superior and would be recognized as superior by any right-thinking, intelligent, logical human being. It is significant that to each group, their own view of the world appears to be the "common sense" or "natural" view.

   Let's take a brief look, by way of example, at Americans and the cultural characteristic of *cleanliness.* We generally consider ourselves among the cleanest people in the world. We're quick to criticize many other countries and cultures as being "dirty." Yet consider for a moment the following:

   When Americans bathe, they soak, wash and rinse their bodies in the same water—though they would never wash their clothes and dishes that way. The Japanese, who use different water for each of these steps, find the American way of bathing hard to understand, even dirty.

   An orthodox Hindu from India considers it "dirty" to eat with knives, forks, and spoons instead of with his own clean fingers.

   Is it dirtier to spit and blow your nose on the street or to carry it around with you in a little piece of cloth which you keep in your pocket and re-use regularly?

   Many people around the world cannot understand why Americans invariably defecate in the same room where they wash and bathe.

8. The process through which the accumulated culture of any group is passed on to its offspring is, as noted above, called "enculturation." Every person is enculturated into a particular culture. One could say that each society enculturates its own offspring into its own "right way" of doing things.

9. People who stay strictly within their own cultures can go on indefinitely without ever having to confront their ethnocentric or enculturated selves.

10. Problems arise, however, when a person who is enculturated into one culture is suddenly dropped into another, very different culture.[4]

These generalizations should help us to see that we are indeed creatures of culture, that we are bound by our cultural upbringing, and that we judge what others do based on our own acquired rules, regulations, attitudes and values. When we come to realize that our way is not necessarily the only right way, we may become more tolerant of other cultures. We may ask, for example:

Are the British "crazy" because they drive on the left rather than on the right side of the road?

Are the Europeans "uncultured" because they eat with the knife and fork in hand, or when they insist that the hand, when not being used, be

placed on the table rather than in the lap?

Are the Africans "too picky" when they insist that if one presents something, it must be presented with the right hand and never with the left?

Is it "uncouth" to eat raw fish, or is it a delicacy, as some cultures consider it to be? Is it a matter of right and wrong, or of likes and dislikes?

Ted Ward illustrates how different we, as Americans, are, and yet it is obvious that others, though different, are often more logical than we. He says:

> "We are the people of 7-4-76. The very sequence of those numbers is significant. The rest of the world, almost all, would write it 4-7-76. In our habit of speech, we say January first, June thirtieth, or September fifth, with the day following the month. Ironically, for our special national day we say, "Fourth of July." But when we write it or print it, it is still 7-4-76, July 4th, '76. When you get a letter from France, Brazil, or Japan dated "4.7.85." how do you read this? "April seventh" of course. Watch out! The rest of the world does it "backwards." So you have to remember the sequence: day, month, year. To any logical mind, this sequence has a reasonable appeal; from smaller unit of time toward larger units. But no.
>
> *Our* way is the norm. We are the people of 7-4-76; month-day-year, whether it is logical or not. So what is wrong with doing it the way we want to do it? Nothing. It is *wrong* when we think of our way as *the* way. It is wrong for us to presume that our way is the worldwide norm by which all other techniques and styles must be judged. The Japanese, like the British, drive on the "wrong" side of the road. Who is to say that the left side is the wrong side or that our way is the best way?"[5]

The missionary, in order to be effective, must become aware of the ways in which cultures can differ, must be emotionally able to accept the fact that his way of thinking and acting does not necessarily constitute valid worldwide norms and standards, thus accepting the uniqueness of others, and, he must be open to the possibility that other ways of doing things may even be better than his own.

We have seen then, that one of the most important things for a prospective missionary to do is to become familiar with his or her own culture and to develop a cultural awareness, realizing that his or her judgments, decisions, evaluations, habits, and ways of doing things are based on that culture.

Basic Understandings Before Departure

A very important phase of preparations, especially where teenage children are involved, is the need for the family to sit down together and plan how they will handle the stress and "shock" of relocation. Sometimes it

is more stressful for the teenagers to break ties with their peers than for the parents. If this is not handled correctly, the teenagers may become rebellious and bitter, having a feeling of abandonment. It is essential that they be included in the planning and in the preparations, and that they feel that they are a part of this undertaking.

Ideally the entire family should go through some sessions of counseling together to help them establish what their expectations of each other in the endeavor are, and how they will be mutually involved in supporting one another and fulfilling their mission.

Psychological testing has proven to be a vital tool in selecting missionaries. Some feel threatened by such testing, but should realize that these are not *exams,* but ways of analyzing personalities, revealing strengths and weaknesses of the individual. *These are not intelligence tests.* Often we are not aware of where our breaking points are, nor are we aware of our real strengths. Looking at personality profiles can reveal what is likely to happen when stress builds up. It can help us to see ourselves as we really are. Such tests are not always the answer, but are generally, scientifically valid indicators and should be considered. Again, this could be an important factor in preparing for culture shock.

Before the missionary departs for his or her assignment, some very basic things need to be spelled out and thoroughly understood in order to minimize the pressures of settling in the host country. If one arrives on the field with these things unresolved, the culture shock will be compounded. Individual cases may warrant other clarifications in addition to these basic questions:

What will be the responsibility of the sponsoring church?

What will the missionary's responsibility be?

How much should the salary be?

Will there be a working fund, and if so, how much, and how will it be used?

If married, what will be expected of the spouse?

How will the children be provided for (schooling, social activities, etc.)?

Will extra funds be provided for the schooling?

How long does the missionary plan to stay?

With what frequency will he/she/they return home on furlough?

How will these furloughs be financed?

What about days off and vacations in the host country?

Where will the missionary live? Will furnishings be provided?

What about transportation? Will a vehicle be provided?

Who will provide medical insurance? Will there be other insurance?

Who will take care of taxes and stateside banking?

Will someone be appointed as liaison between the sponsoring church and the missionary? Will that person be the correspondent? Will there be a

monthly report? Will it be published and sent to all supporters and friends? Who will be responsible for this?

Will the missionary learn the language? If so, at whose expense, and how much time will be allotted to language learning.

Learning about the Target Country

Not only is it important to have the above questions clarified, but it is also necessary to learn as much as possible about the target country to which the missionary will move. Some of these important questions include:

What is the principal language? Should I learn the language?

What is the best method for learning the language?

What are the major religious groups in the area?

What is the status of the church and mission work in general?

What is the weather like? What seasons should we expect and when do they change?

What are the leading diseases? What precautions should we take?

What documents must we bring (passport, visa, shot record, birth certificate, marriage license, diplomas, driver's license, etc.)?

What form of government exists? Does it appear to be stable? Is the government hostile to Christian mission work? What is the general attitude toward missionaries?

What currency is used and what is its value against the dollar?

Is public transportation available? Is it relatively safe?

What is the average income for the national family?

What would be a reasonable monthly salary for a family of the same size?

What is the geography of the country like?

Is there electricity? What is the voltage/cycles? Is it dependable?

Can I use American appliances? Will I need a transformer?

Is there plenty of water? Is it safe to drink? Should we bring a purifier?

What foods are available? Is shopping a problem?

How is the educational system? Are there schools for our children?

What is the crime rate? Are there frequent break-ins?

How and where will we be expected to live? How does this compare with the average citizen? Who provides this housing?

Are resident visas difficult to obtain?

Learning About The New Culture

Much can be learned about the new culture before leaving home. Comparisons should be made between the home and the host culture. Questions can be asked, books can be read, and often people from that culture are in or near our own neighborhoods. We could make an attempt to interview them, and perhaps even obtain an invitation into their homes.

Before my first trip to Nigeria in 1981, I called a Nigerian Christian in Los Angeles and asked if I might come to their home and share a typical Nigerian meal. The family appeared to be delighted that I wanted to share their Nigerian food. They spent the entire evening informing me of their culture and telling me what to expect.

Some questions to ask about the host culture:

What are some of the national customs and characteristics that seem to upset Americans the most? Which social customs should we be aware of? What is the typical greeting in the morning, afternoon, and in the evening? How does one respond to these greetings?

What does one say when departing?

What is the protocol for paying a visit? Does one take a gift?

If someone offers a gift, should one accept it? What is the response?

What is the proper dress when visiting during the day?

What is the proper dress when going to worship?

What is the proper dress when visiting a government official?

What are some taboos of the culture?

What is a typical gesture for beckoning someone to "come here?" How does one wave "hello" and "good-bye?"

Do the women socialize with men? (With missionary men?)

Do women cover their head or veil their face? When? Only for worship? Do women sit with their husbands in worship?

Who does the farming? Who takes the food to market? Who does the shopping?

What is their attitude toward time?

What customs do they observe at mealtimes? Do they eat regular morning, noon and evening meals? If so, do they eat together? What constitutes a typical meal? What other foods do they eat? What is their typical bedtime and rising time?

Who goes for water? How often?

What is the typical dress for women? Do they ever wear slacks?

Are there taboos for showing affection in public?

Do men sometimes hold hands while walking? (This is common in Africa.)

What do women do for recreation? What do men do?

The individual or family may have a host of other vital questions. If these questions can be explored, studied and discussed before departure to the mission field, much stress can be averted and a smoother entry can be made.

There are numerous little irritants to the average American in any foreign culture. One of the major ones in Africa and in Latin America is the lack of concern for time and punctuality. These are of major importance to most of us.

We live by the clock. We are aware that there are 24 hours in a day and that every minute is important. "Time is money" to many business men. We not only keep calendars, but we keep hourly appointment books. It is no wonder that the lack of emphasis on time and punctuality in some societies upsets us so much.

Whereas we are very strict about being "on time," our definition of being "on time" is not accepted in all cultures. In some cultures it is appropriate to come an hour later than the agreed upon time. This seems to demonstrate a certain power or authority, especially among chiefs and other high-ranking persons.

It is almost an exercise in futility in Africa to insist that a program begin punctually. A young preacher showed up at the guest house where I was staying in Nigeria early one Sunday morning. He asked if I would drive him to his preaching post before going to the place where I had been invited to preach. I asked him how far it was and how long it would take. To a person who has never owned a car and has never "timed" himself in getting to and from a location, nor has he ever been asked the distance, this was not a good question. He said, "Oh, it will take about 15 minutes, it is only a few miles."

So we left early, and in about forty-five minutes we were "almost there." I tried to keep my composure, but did let him know that I was very disappointed in the way he had tricked me. He grinned with embarrassment.

Finally we arrived at the exact time that I was supposed to be at my appointment. He then announced calmly that his brethren were expecting me to preach, and they would be extremely upset and even insulted if I drove off without addressing them. Furthermore, he would have to go back with me to show me the shortcut to my appointment. I was helpless. I went in and preached a short sermon, then excused myself.

The brothers all got up and left with me, bringing pineapple, bananas, and a chicken to put in the trunk of the car as a "dash." This had obviously all been planned; now how would I explain this to the church where I was supposed to have been? The young preacher joined me in the car, and we left. He kept saying, "Don't worry, don't worry!" We arrived back at my appointment one hour late. I was embarrassed and inwardly upset. To my surprise, they did not seem to notice that I was "late." In their way of thinking, I was there, and that was all that counted.

I learned several lessons that day, most of which are obvious from this story. The event certainly did not fit within my cultural framework. In subsequent trips to Nigeria, I realized that if I depended upon my brothers to take me to a location for any event, regardless of the time of the appointment, we would almost always be there late—at least to my way of thinking. They were always unconcerned. Could this be a basic difference in our cultural upbringing, or is it basically "wrong?" As a matter of fact, whether I like it or not, it is a cultural thing.

They jokingly call it "African time." Several factors enter in here. Americans live by the clock. We have dependable transportation and good roads. Seldom do we have a flat tire. Hardly anything hinders our being on time. We expect punctuality. I recently read of a patient who sent his doctor a bill for $90 for the hour that he had to wait after being on time for his appointment. People are constantly being fired for being late. Students will be dropped from class or have their grades lowered even for being tardy too many times. We take it seriously. It is our culture.

We learned in Europe that an invitation to dinner at 7:00pm, meant that we should be there at 7:15pm. We also learned that it was a social mistake to be there even two minutes before seven. University classes are announced to begin on the hour, but the norm is for the students to be there and seated when the professor arrives at fifteen minutes after the hour unless otherwise indicated. To applaud a point, the students knock on their desks rather than clapping their hands. To show disapproval or disagreement, the students shuffle their feet or, in some cases, stomp their feet. These are just minor differences to our culture, but the list could go on and on for each culture.

Again, we must be constantly aware that there are numerous differences from culture to culture. When we enter the mission field we need to open our "bag of tools" as soon as we arrive in the country, and we need to start immediately exercising what we have learned about culture and culture shock. We will need to add to our stock of tools as new experiences arise. We will need to re-sharpen our tools as we lose our temper over cultural differences. As stress builds up we will need to remind ourselves of the reasons for such stress. We may have to bolster our spouse and our children as irritants begin to get to us.

Having regular family meetings to openly discuss these things and to encourage one another will help to lighten the burden and to bring about a smoother and more rapid adjustment to the culture. It should encourage us to know that the vast majority of missionaries do adjust and have a successful ministry.

Language Learning and Language Shock

Learning the language is essential to gaining deeper insights into any culture. It has been said that one cannot possibly understand a culture without understanding its language. Culture is tied up in language. Language learning is, however, stress-producing and is more difficult for some than for others. Dr. Paul Hiebert says:

The first shock we often experience in a new culture is our inability to communicate. Ever since our early childhood, we have talked, gestured, written, and talked some more – until we are no longer aware of the communication processes themselves. They have become almost automatic.

Suddenly, as strangers in a new world, we are stopped of our primary means of interacting with other people. Like little children, we struggle to say even the simplest things, and we constantly make mistakes.[6]

The fact is that this goes on for weeks and months. The missionary is frustrated because he cannot display his intelligence and his education, nor can he demonstrate his ability to reason and debate issues. He can only speak like a child and respond like a child. This "language shock" also contributes to culture shock, sometimes being the principal contributing factor.

At this point the missionary might easily become discouraged to the point of giving up language study, concluding that he just cannot learn languages. It is a fact, that we cannot learn a language without making mistakes and without practicing it over and over again, until finally it begins to make sense to us.

We have to become like little children, not childish, but childlike. Eventually there will be a breakthrough, and the rewards of our ability to minister and to communicate Christ will far outweigh the efforts, though difficult they may have been.

If the missionary despairs and decides to hang on to an interpreter for the duration of his or her ministry, he or she will never realize his or her potential. Some have indeed done this, even for many years, but there has always been that language barrier which has kept the missionary from the most intimate relationship with the people. There may be an exception in countries where English is the major trade language, and where English is the language used in the schools. Even in these cases there is still the mother tongue known as the "heart language." It would be far better if the missionary could communicate in the heart language.

Hiebert points out that other contributing factors to culture shock include changes in routine, changes in relationships, a loss of understanding, and emotional and evaluative disorientation.[7]

Regarding changes in our routine, we have always been able to accomplish our banking, our grocery shopping, going to the post office and dozens of other tasks without difficulty, and still have plenty of time for leisure. On the mission field we spend a lot of our time just trying to survive. Each of these "routine" tasks has become a major ordeal, sometimes taking hours just to accomplish one of them. No time is left for the more important things, such as teaching a class, visiting, counseling or just taking time to sit down with the family.

At home we knew the banker, the laundry personnel, the mail carrier, the grocer, all of our fellow church members, our friends and family. Now we are among strangers, and we cannot communicate with most of them.

In the beginning we struggle just to build a few new relationships. This is a slow and tedious undertaking.

In the new culture, much of what we took for granted at home is not present. We knew what to expect when we went to purchase something. Now we must learn to bargain. We knew the street signs and their meaning. Now, if there are any, sometimes they are strange to us. Even the traffic officer makes strange gestures that confuse us rather than help. Our knowledge is no longer helpful and we become discouraged.

Emotionally we are disoriented because we don't hear the familiar sounds, the familiar music, we miss the familiar foods, miss our friends and family and the comforts of our stateside homes, miss the evening news, the familiar smells, the ease with which we prepared meals, or the ease with which we went to a nice restaurant with no concern as to whether or not the food would be safe. All of these things tend to drain us emotionally.

We find it difficult to evaluate what we see all around us. There seems to be cheating, stealing, lying, immorality, indecency, bribery, indecent dress, and then we are surprised and distressed to hear that the people think we are just as immoral, that our dress is indecent, and that we are stingy because we have so much and share so little.

Is it any wonder that missionaries suffer from culture shock? And yet, by the grace of God, because of the desire to serve, the missionary usually lives through it and profits by the grueling experience. It may dominate the missionary's attention for the first year or more, but it is an important experience associated with entering a new culture—one which causes us to look at and evaluate what is happening to us. We can and should emerge stronger than before and ready to effectively minister to the lost and to the saved.

Reentry Shock

Only in recent years has attention been given to the returning missionary and especially to the returning children (MKs = missionary kids). Although this chapter has dealt primarily with preparing for and dealing with culture shock, the author wishes to stress that much help is available for those who return and suffer what is called "reverse culture shock." This is a very debilitating thing, especially for children who are unfamiliar with their own home culture. Although they are "at home," they are, in reality, in a strange place, not knowing what is expected of them, not knowing how to socialize, how to act and react. It often causes them to withdraw and to isolate themselves. Many MKs have been lost to their families and to the Lord, because they went into some subculture where they would be accepted along with, and in spite of, their "strange ways."

Adults have returned after years abroad, only to find that American churches and individuals have become "materialistic, obsessed with entertainment, worldly, aloof to the lost world, and 'cool' toward the returned missionary." In most cases this is a reaction resulting from the disorientation of reentering a culture from which they have been separated for a long period of time. Reverse culture shock, or reentry shock is very real, and the missionary family should not be shunned or criticized, but rather counseled and helped in this very critical time.

Some of the best material available on this subject is a book of readings edited by Dr. Clyde N. Austin, entitled *Cross-Cultural Reentry: A Book of Readings*, ACU Press, Abilene, Texas, 1986. Dr. Austin also provides counseling to returning missionary families, preferably going to the mission field to council with the family before their return to the home country. This has proven to be a "saving factor" to many returning families. The Mormons have done this for years for their thousands of returning missionaries. Many business organizations have a reentry program for their returning families, realizing what can happen to them if they return unprepared. The Link Care Center in Fresno, California, also sets up special sessions for returning families.

As an experienced returned missionary, the author strongly advises sponsoring churches to take advantage of one of these services. For churches of Christ, in the opinion of the author, Dr. Austin offers the best and most reasonable service. Dr. Thomas N. Schultz and his wife, Dr. Dorris M. Schultz, have both written doctoral dissertations on the reentry of missionaries of churches of Christ and the importance of designing and implementing programs to meet their special needs. Please see these and related works listed in the bibliography.

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Chapter 7

Causes of the High Incidence of Disease in the Tropics

R. Maurice Hood, MD
Marble Falls, Texas

There will be, of necessity, some overlap with the material in this chapter with other chapters but it seems to serve the author's purpose to emphasize the causes of illness with prevention in mind. This is not a general discussion of the causes of disease but the causes of disease as related to missionaries and other expatriates.

Attitudes

One of the most important factors is the attitude that missionaries bring to the mission field. The missionary must realize that they are entering areas where the risk of contracting disease is greater than it is at home and act accordingly. Some have the idea that they are indestructible and ignore precautionary measures. Some who have been on the field for some time without becoming ill develop a false sense of security and become lax with regard to their health. Some problems arise when the missionary has inadequate knowledge about living in the tropics and about tropical disease. As mentioned in another chapter there are those who believe that if they are faithful Christians they will be protected against disease and death.

Malnutrition

Malnutrition is a constant way of life for most native people. Expatriates assume wrongly that this will not be a problem for them. Food availability varies from one area to another and from one time to another. The food that is available is often inadequate for good nutrition. Protein obviously is the most important factor. Of the meats that are available, chicken either frozen or fresh is usually the most obtainable. Beef is not as easily obtained and is generally of poor quality. One has to go to the slaughter place at a village or town and try to get meat as quickly as possible after the beef is slaughtered because there will be no refrigeration and the mass of flies that are attracted to it is almost unbelievable. Some will stop eating beef either because of the taste or the difficulty in obtaining good beef. Pork, except in the form of small canned hams which are quite expensive, is not available.

Fish is the only other meat available. It comes in three forms: a dried mackerel which is imported from Scandinavia, locally caught fish, and frozen fish which are often available in the stores. The dried fish is very distasteful to Westerners and is usually not eaten. The fresh fish is often spoiled and grossly contaminated. Frozen fish is expensive and may be fine if it has been continually frozen. Its appearance and odor are the only guide one has as to its safety.

The only readily available protein source is eggs which are almost always available. Eggs represent a good food but in older people with vascular or cardiac disease intake may have to be limited to one or two eggs per week.

With these facts in mind it is possible to see that inadequate protein intake is possible and may be constant.

Available foods are often vitamin deficient but not usually to a critical level. The taking of a multiple vitamin with iron is justified. While vitamin deficiency disease is very common among the native people, the author has never seen an expatriate with a vitamin deficiency disease. Vitamin A deficiency is not uncommon in expatriates and may be manifested as a macrocytic anemia.

Fatigue

Fatigue is an important factor particularly in medical personnel. The need of services always exceeds the abilities and energies of the doctor and nurse. The sick and those requiring operation are simply overwhelming. This is true to a lesser degree in missionaries other than medical ones. While it is hard and may be impossible to say no, chronic fatigue and sleeplessness will exact their toll in illness. One must not over schedule work to the point that there is no time for rest. Except in life threatening emergencies, work must be scheduled at a level that is realistic. If surgical, obstetrical or medical emergencies arise and require extended night work, it is wiser to alter the next day's surgical and clinic work to allow for rest. One would always like to accomplish as much as possible but not at the risk of illness which may stop all productive work and become self defeating.

Native people, particularly preachers, will come at all hours to present their needs and problems and can prevent all leisure and rest. It is better to set a specific time once or twice a week for them and insist that they cooperate. Those that do not honor this request should be firmly told by the spouse or the native workers in the house to return at another time. They should not be allowed to disturb the doctor or missionary while they are resting.

It has been my observation that nurses are just as prone, if not more so, to overwork and chronic fatigue than the doctors. They are called upon by everyone at all hours to cope with innumerable problems, patients and

visitors. Often other workers fail to realize fatigue and do not try to help. They often assume most of the responsibilities for the care of small children with the attendant anxieties.

Long term missionaries need periods of vacation time preferably at no greater intervals than six months. They should travel some distance away from their station so that the problems there will be at least physically removed. Real rest and recreation can then occur.

Failure to obtain adequate rest will result in a chronic fatigue state which may not be recognized as such. More likely, interpersonal problems will surface. The missionary may have clashes with workers where they were once kind and patient they are now impatient, rude and abrasive. Inability to be able to rest and to sleep may also develop. Other than the psychological impact, physical illness may intervene.

Insect Borne Disease

These diseases are covered in more detail in several other areas and are only mentioned here. Insects that serve as vectors for disease include mosquitos, flies, ticks, lice and mites. The variety and number will vary from one geographical area to another. There is no way of overemphasizing the importance of minimizing the number of mosquito bites. The measures used for this are described in the chapter on health maintenance but include: staying in at night as much as possible, wearing long sleeved shirts and trousers, using effective insect repellent in the evenings if one must go out, sleeping under mosquito netting, and keeping window and door screens in good repair. Continual use of a malaria suppressant drug is necessary. Neglect in this area is one of the greatest causes of disease and disability.

Where ticks are present, a nightly search for them should be done with removal of the ticks. Lice are important transmitters of disease particularly typhus fever. A supply of Kwell or similar agent should be available to combat lice.

Heat

The high humidity and continual high temperature in tropical areas can cause sunstroke and heat exhaustion. Salt and water loss from sweating occurs at a more rapid rate. Cooling from sweating is less efficient where the humidity is high. One must always have access to water and salt particularly if there is to be prolonged outdoor activity. Fans should be used if they are available. Heat exhaustion is produced by water and salt loss in excess of intake. Signs of impending heat exhaustion should be kept in mind and include weakness, excessive sweating, increased pulse rate, and lowered blood pressure and fainting. Fever is a critical sign indicating that fluid replacement and cooling are now an emergency.

A differentiation should be made between heat exhaustion and sunstroke. The two overlap to some degree but sunstroke is caused by both fluid loss and exposure to heat and is characterized by high fever, confusion, cessation of sweating, and coma.

Contaminated Water

Other than the mosquito, contaminated water is probably the greatest source of disease in the tropics. In most African countries and many other tropical areas there is no safe public water system. If fact, in West Africa, there is usually no water system at all. Westerners have difficulty conceiving that this situation is real. Rural areas depend upon rivers and small streams that are invariably contaminated. There are in some countries an increasing number of water wells being drilled.

Water must be boiled 15 to 20 minutes and filtered through a bacterial filter in order to be safe. Bottled soft drinks are safe. Water in hotels and restaurants may be safe but it is better to assume otherwise. Boiled and filtered water can be placed in bottles and carried on trips or when going just to the city. Laxity in care of what one drinks can be expected to result in illness, most often the diarrheal diseases including amebiasis.

Contaminated Food

Food handling anywhere must be carefully carried out and monitored continually and Americans take this for granted. In most Third World countries there is no effective public health system. Standards of refrigeration, facility inspection, and healthy food handlers which are periodically examined are what we expect. In the mission field none of these things exist.

Fresh vegetables, because they are washed in contaminated water, lack protection from flies, and have no or inadequate refrigeration, can be assumed to be unsafe when purchased. Frozen food cannot be assumed to have been kept frozen and should be examined for odor and color. Even then one cannot be certain. Refrigerators that are available are often inadequate in maintaining a stable temperature and are often off because of frequent power outages. Native cooks are rarely examined for parasites and other diseases. They should be well trained by the missionary to clean and prepare food safely.

Fish that are locally obtained may be poisonous and will not have been refrigerated and should be avoided. Commercial frozen fish may be safe.

Foods that normally make up the diet of the native people such as rice, cassava, yam, bananas, and papayas will be safe. Other native foods such as bush rats, rats, and snails should be avoided.

Tropical Climate

This is expected by most expatriates to be an important factor in disease. It is true that, given the opportunity, many parasitical diseases and parasites flourish but the climate is not a major cause of disease. As stated previously *poverty, malnutrition, ignorance, and impure food and water* are infinitely more important. The climate alone is not a major factor.

Exposure to Contagious Diseases

The incidences of infectious diseases which are transmissible to others are so much more common in the tropics that expatriates are unavoidably and frequently exposed. Some of these illnesses that are almost epidemic in the Third World include viral hepatitis, diarrheal diseases, amebiasis, poliomyelitis, rabies, typhoid fever, measles, and tuberculosis. There are also the exotic highly lethal viral diseases such as Lassa fever and the Ebola virus. These occur sporadically and are relatively rare but they are highly contagious and very dangerous. Except for the latter two and tuberculosis all are preventable by immunization.

Amebiasis deserves a special comment. It is discussed in more detail in the chapter on parasitical disease. It is an ever present threat. It is caused by fecal contamination of water or food. Native food handlers may be carriers. The disease is often insidious. A family member may become infected, remain asymptomatic and serve as a source of infection for the entire family without being suspected.

Viral hepatitis, also discussed in other chapters, along with malaria and amebiasis are the three diseases most likely to be contracted by missionaries.

It is not possible to avoid contact with sick people nor should one make any effort to prevent contact with native people. Contact should be minimized with patients or people known to have contagious disease. Good personal hygiene is always a major factor in preventing transmission of disease.

A final comment

Although human disease is more common in the Third World most of the reasons for this fact are those which have been mentioned above. Poverty, ignorance, malnutrition, impure food and water, and the lack of effective public health activity are the principal etiological factors. For the missionary, the etiology may overlap some but generally the basic causes are different with carelessness being the most important problem. The missionary can usually avoid major illness but those people who the missionary has come to serve are mired in an endless cycle of disease, malnutrition and death.

No amount of medical care will change this very much very soon. Reading the experiences of Albert Schweitzer prior to 1920 and comparing them with the conditions and experiences of our time serves to illustrate how little has changed in the past 75 years. The answer to real change must come from the native people themselves. Once motivated and taught they will know what they must do. All those who serve can teach. Progress is slow and sometimes not perceptible. Protection of our own health is important but the face of Africa, Central and South America and Asia can change. We can help produce that change.

Chapter 8

Getting Medical Help in the Mission Field

Henry Farrar, MD
Lebanon, Tennessee

Find it before you need it!

As soon as you move into a new community, a priority item is finding where to get medical help. You would do this in America so why ignore it overseas? In the Third World there are no yellow pages or even phone directories. In fact, if you can find a telephone that works consider yourself *very* lucky. You must seek advice on doctors and hospitals. The best places for this kind of advice are: 1. Experienced colleagues with whom you plan to work; 2. The missionary community in the area; 3. Expatriate business people who have been in the area for some time; and 4. Possibly embassies or consulates of the "Western Countries." At any rate, begin on this project as soon as you arrive. Remember, "You don't need money if you have friends." Or to put it another way, "Plans fail for lack of counsel, but with many advisors they succeed." (Proverbs 15:22)

The sources listed above are the best beginning point for identifying the medical facilities and doctors that will be able to help you. Find where all of the hospitals are within a radius of 50 to 100 miles. Visit them and become acquainted with the senior medical officer and inquire about their capabilities in such areas as x-ray equipment, surgeons, surgical capabilities, and anesthesia. The presence of an American or British doctor may be of real help. In Africa, the hospitals of the Seventh Day Adventists, Baptists and some of the Catholic hospitals are very good.

Most African countries have one or more medical schools and the hospitals associated with them are much better than the government hospitals. Some of them were established and staffed by England and other colonial powers and are excellent hospitals. The teaching hospitals in Ibaden and Lagos, Nigeria and in Nairobi, Kenya are good examples.

Doctors, as well as hospitals, can be identified and many of these have excellent qualifications. Many have been trained in America or in Great Britain. It is helpful to identify a pediatrician, an obstetrician-gynecologist and a general surgeon who know you in advance and can be of help in an emergency.

Bush Missions Need a Medical Arm

Paul, age eleven, our oldest son, was sick one Sunday morning with vomiting and big time abdominal pain. We had been in Africa just seven days. My diagnosis was appendicitis. My being a surgeon and my wife a nurse was helpful. Since I had just completed a month long visit to hospitals in the area I knew there was a hospital with USA standards two hours away. It was attached to the compound of the Shell Oil Company. All went well. I shudder to think of missionaries with no medical connections having a serious illness in the bush.

There should be a medical professional with every mission in the Third World. There are physicians in every congregation that sends missionaries into the under developed world. How good it would be if the local doctors in America could go with them. They could help them to know what to do where there is no doctor. Periodic visits to the bush mission to provide medical care for "our people" would save money and promote efficiency, not to mention the potential for saving lives. Also, this would help the missionary to know a little more about how to help the native people that he is there to serve.

Make up a Lifeline, Someone Is Drifting Away

OK, so you missionaries are bound for the bush and your doctor cannot go with you, even for a short time. You definitely need to have some long talks with him or her *before* striking out on your safari. This should be developed into a real lifeline where you can get information and advice by letter when harsh reality sets in in the jungle. Giving a doctor the opportunity to help you may even be the means of saving his or her soul.

Books Are Your Friends, My Friends

The *Merck Manual* is a book which every missionary should have. It is written for doctors and the nonmedical missionary may need a medical dictionary to help in understanding it. Much of the information is in plain language and can be understood. The book is a boiled down, no nonsense book which is excellent for those with good medical training. Many American doctors practice in such narrow specialty fields and have little background in areas outside their specialty. Very few doctors in America can diagnose and treat malaria and other tropical diseases such as hookworms or schistosomiasis without some help.

It is hoped that this book will also supply some of this information both to doctors and to the lay missionary. Another book, *Where There is no Doctor,* is an indispensable book in the mission field. There is a bibliography at the end of this book listing these and other books that will be helpful.

"A Fool for a Doctor and a Fool for a Patient"

I believe that this quotation is from the peerless Sir William Osler, the father of American medicine. It speaks of doctors who try to diagnose and treat themselves. This is dangerous for lay missionaries as well as doctors. Malaria is so common in the Third World that otherwise intelligent workers just take a few tablets when the influenza-like symptoms appear. Over medication with Chloroquine may cause serious eye problems, even blindness. Quinine may precipitate the very dangerous blackwater fever, a complication of malaria if it is given to a vomiting, dehydrated patient. On one hand, taking potentially dangerous drugs for "tiredness, weakness or headache" is too much medicine. On the other hand, paying too little attention to serious signs like prolonged fever, blood in the stool or prolonged vomiting or abdominal pain is too little medicine. Another bad procedure is to take chloramphenicol or Cipro for relatively minor illnesses. That is like shooting a hummingbird with a cannon.

Plan Ahead

If an acute apparently serious illness develops, one should have ready made plans with the native people with whom you work so that they may be able to assist you. Sometimes, even doctors, can be rendered incapable of any action or decision making and become suddenly dependent upon others. They need to know where to take you and what doctor to contact. Do not wait until an illness becomes serious or critical before seeking help. An unnecessary trip of 50 or 60 miles is preferable to seeking help with a ruptured appendix or serious pneumonia too late.

Most countries have long distance, transcontinental telephone service and it may help to call a doctor at home and seek his advice on illness or symptoms that are confusing or frightening.

Cleanliness Is Next to Godliness

I do not know who said that and I think it is a bit exaggerated. In the days of AIDS and Viral hepatitis and other contagious diseases it is considerably more relevant. Do not touch anyone's blood—flee from it. If you are in a hospital where nurses touch you who have just handled other patients and are not wearing rubber gloves which they have changed between patients, they could transmit a serious disease to you. The way to evaluate a hospital is to see if gloves are being worn, see how blood and bandages are handled, note if a new sterile syringe is used to give medications to each patient. "Watch and pray." Syringes may be in short supply so that you must have your own syringes and gloves for use in treating yourself. You should also have a bottle of bleach which can be used full strength to clean up spills

of blood or other body fluids. It can be diluted and be germicidal in cleansing skin. Always carry soap with you.

It is possible to become a "neat freak" and insult people who offer you food or drink. Bananas and other fruits are safe in their peelings. Hot tea is a safe drink, but do not ice your tea with cubes made from unsafe water. Well cooked foods are the safest. If you are uncertain about something offered, you can point to your stomach and indicate that such does not set well with your weak stomach or use the term "white man's stomach." Asking for hot tea, a bottled drink, fruit or plain bread will make your refusal of something you are unsure about more polite.

More about Neat Freaking

Do not expect the cleanliness that you are used to in an American hospital to be present in the Third World. It is possible that you might find this but it is unlikely and you will be the true "ugly American" if you turn up your nose at everything that does not suit your tastes.

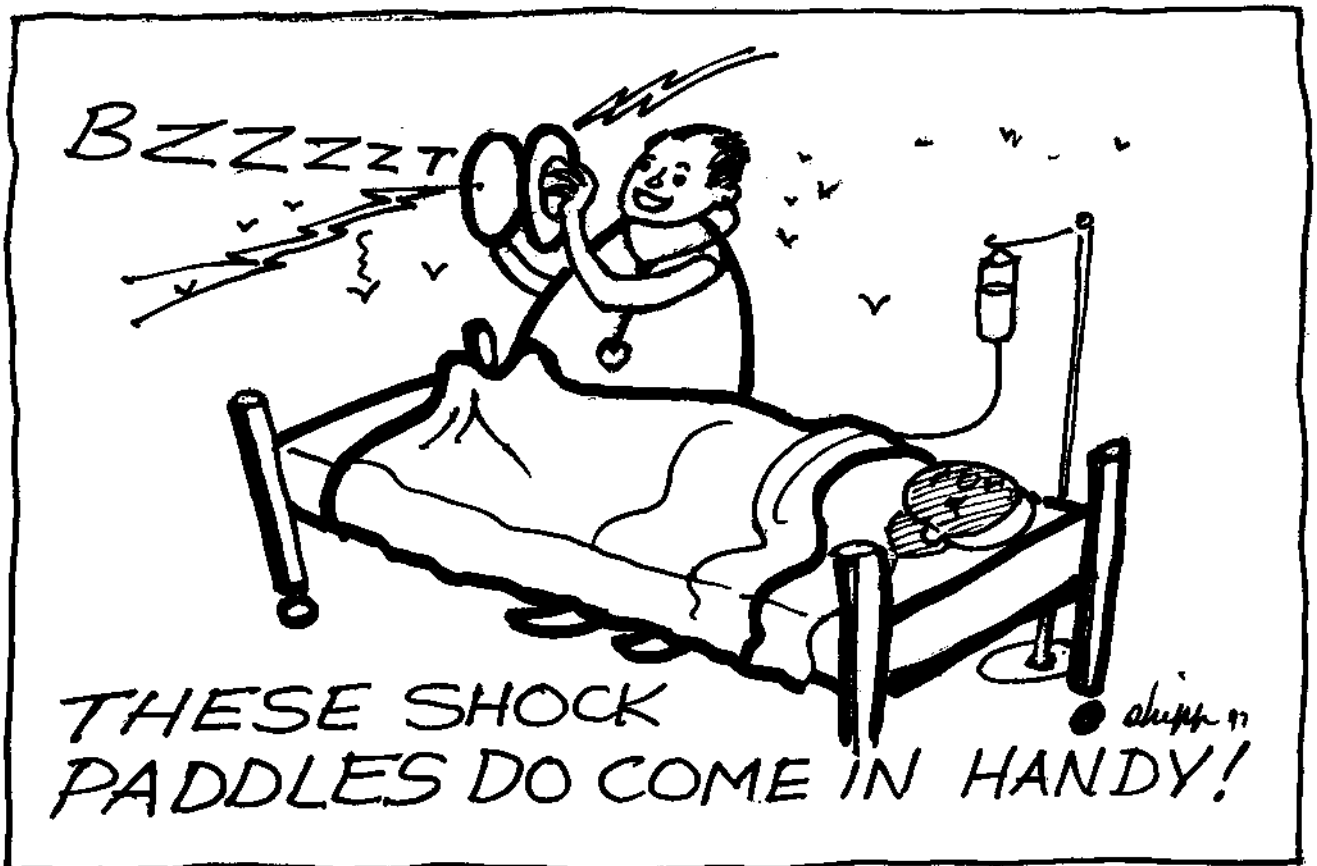
A good example is the presence of lizards in your dining room or bedroom. They are absolutely harmless. They *do* eat innumerable insects and mosquitos carrying disease. They may even drop from the ceiling or fall in your soup. Not to worry.

When there is no air conditioning, there are lots of sounds and odors which may be esthetically unpleasant. The patients are closer together in bush hospitals than they would be in America. Please, do not become upset at any of these things or you will be a general nuisance or possibly have a nervous breakdown!

You can get perfectly safe and good medical care in a hospital which does not look or smell like you think a hospital should. Therefore, do not grade or judge a hospital on its looks, sounds or smells. *You should grade a hospital on the friendliness of the personnel, frequency of cleaning personnel, cleanliness of workers and how they handle blood and fluids, and the medical qualifications of those in charge.*

Sometimes in an undiagnosed or chronic disease it is best to return home for medical and surgical care. This should also be planned in advance. Talk to the managing agent of KLM, British Airways, Lufthansa, or Air France and find out what their requirements are for the transportation of someone who is ill with a noncontagious disease. Sometimes an accompanying doctor is required.

Also find out how much time is required to secure a reservation. In the past this has taken up to two weeks. If you know someone with some influence such as an influential business man, a military officer or an embassy official, this may help. Sometimes major expatriate companies such as the oil companies have travel arrangements which they will share in an emergency.


BZZZZT
THESE SHOCK PADDLES DO COME IN HANDY!
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Chapter 9

Health Maintenance in the Mission Field

R. Maurice Hood, MD
Marble Falls, Texas

The author has seen a considerable number of missionary personnel who have become ill in the field. Some of these were illnesses which one might contract at home and others have been peculiar to the geographic area. It has been apparent in most cases that either the person had not had adequate health care or that they had ignored precautionary measures that are necessary if one is to remain well.

This chapter contains information for health maintenance for those serving or planning to serve in underdeveloped areas. There will be some overlap with the chapter on "Infectious and Parasitical Diseases" but that chapter is primarily designed to give the missionary some insight into the spectrum of diseases which involve the native people. This should prevent unnecessary fear of disease and, hopefully inform the missionary so they might be able to recognize some of these diseases and be able to help or at least give pertinent advice. Another point to be recognized is that most of the diseases are not transmitted by personal contact and there should be no fear of close personal contact with those they serve.

The medical information in this chapter is not intended to be definitive or complete. Most of the facts presented are readily available from local doctors or nurses, however, the missionary does not have the luxury of being able to become informed by a telephone call or, if ill, to be able to have medical attention immediately.

Staying well in the Third World consists of adapting two simple concepts: one, taking adequate precautions against insects that transmit disease and, two, taking full precautions in what one eats and drinks.

There are several concepts which people have that are dangerous to their health as well as those who work with them. One is that healthy Americans have nothing to fear. Some develop a bravado and think that it is all right to ignore or shortcut precautions. Some, particularly doctors, seem to think that they are immune to disease. There are some that have been overseas several times or in the field for several years without becoming ill and abandon all precautions. There is also a religious concept held by a few that if one is a faithful Christian, God will protect and illness will not occur. The author cannot find any scriptural basis for this belief and there is plenty of evidence to the contrary.

All of these situations represent serious error and illness is likely to be the result. Further, they become very poor role models for new or inexperienced missionary personnel.

Avoid chronic fatigue which makes all prone to illness. Missionaries are often faced with challenges beyond their physical capabilities. Rather than exhaust oneself it is wiser to recognize physical and psychological limits and stay within them. At the Nigerian Christian Hospital there are many who come wanting operations and surgeons who try to operate on all comers push themselves and the hospital personnel beyond normal endurance. As an example, in the district that the Nigerian Christian Hospital serves there are about 125,000 people. Those who are in need of elective surgical procedures number in the thousands. One or two surgeons, no matter how hard they work, can operate only on a very small percentage. Therefore, it is better to concentrate on doing good work at a pace that avoids severe fatigue.

An afternoon rest after lunch of an hour is a good custom to acquire. Native workers need to be taught to respect this period of time and not come to the compound with every problem just because they know that the doctor or missionary is there.

Evangelistic trips away from the mission station should be planned so there will be a normal amount of time for sleep and rest. Sufficient food and water should be carried to avoid having to depend an local sources. It is wise to take mosquito netting but if this is impractical, insect repellant should be taken and used. Eating native foods or in local restaurants may on occasion be safe but more often represents a risk. Green salads and un-boiled water should be avoided. Pay no attention to hotel or restaurant claims that its water is chlorinated. Assume, particularly in rural areas, that canned drinks, carbonated bottled drinks and boiled water of your own are the only safe things to drink. Use disposable cups or drink from the original containers. Remember that water that is not safe to drink is not safe to wash dentures or contact lenses or brush teeth. One simple device that can be carried and used is a cup-sized immersion coil. These can be used only if there is electricity and if a converter is available. Sight-seeing jaunts into remote areas are best avoided.

As mentioned in a previous chapter, immune globulin is advisable prior to travel and at four month intervals. This is the only defense against forms of infectious hepatitis other than hepatitis B. There is no need to repeat other immunizations.

Safe Water

The reader will note that contamination of water is a major source of parasitical and bacterial disease. Therefore, having a supply of water known to be safe is one of the best ways of protecting against disease. A well properly

drilled away from contaminated soil is the best source. It should have a clean, sealed storage tank. Chlorinating systems are available and are not expensive, however, available supplies and absent repair facilities are against the use of this modality. A second choice is to gutter the houses and collect rainwater into cisterns or barrels which also must be clean and sealed from secondary contamination. In Africa during the dry season another source of water must be secured unless the cisterns are large enough and the collecting gutters extensive enough to provide a three-month supply of water. Water of this source should still be boiled for fifteen to twenty minutes then filtered through a system with a bacterial filter. These systems which hold about two gallons are available in most tropical areas.

The least desirable source of water is a nearby stream or river. Most of these are heavily contaminated from cattle and from using them to bathe and wash clothing in. There is always heavy contamination from surface runoff where there are no latrines and urine and feces are left on the surface indiscriminately. Water can be pumped to the living area but sometimes must be manually carried in metal containers such as four gallon kerosene cans which are widely available. The water for washing and bathing need not be purified but that for drinking and cooking must be boiled and filtered.

A supply of 28-32 ounce bottles can be used to store water in the refrigerator for drinking and to carry on trips or to an area where drinking water is not available. A common drink in West Africa is "squash" which is a concentrated fruit flavored drink. The bottles make excellent water bottles.

Travel always poses problems for a source of water other than what one can carry. Most areas in West Africa have bottled Coca Cola, Fanta Orange and Pepsi Cola. These are safe substitutes. As a final measure, water purification tablets can be used to make river water safe enough to drink.

Recreational Water

Swimming in small ponds or stagnant pools should be avoided. Many ocean beaches are heavily contaminated by nearby streams that empty into the ocean. Tropical waters may contain poisonous plants, therefore wear shoes when swimming or on the beach. Some fresh water lakes and streams contain snails which are host to schistosomiasis. If this disease is present in the area avoid swimming and wading altogether.

Food and Food Preparation

Procuring food in many mission areas is a constant challenge. There are in most larger towns and cities "supermarkets" which bear little resemblance to stores of that name in America. There is no wholesaling system in most African countries and stores must buy from traders, local

markets or go to Port Harcourt or Lagos and buy food at the dockside from incoming ships. For this reason the available goods are not constant or reliable. Even staple items such as sugar and flour may be unavailable for days or weeks. The author remembers one trip to a large store in Port Harcourt and found that the only canned foods on their shelves was hundreds of cans of dog food. Items such as jelly and syrup are usually present but at very high price. Rice is often present and can be bought at the large city markets as a black market item. In larger cities where there is a sizable population of expatriates there are often vegetable markets. These are grown and sold for expatriate consumption and are grown away from the coast at higher elevations. They usually arrive on Monday by lorry or train and one can buy onions, cabbage, potatoes, and tomatoes. Many regions use night soil or human feces for fertilization. Bacteria and parasitic ova can easily contaminate fresh vegetables. They are usually washed in contaminated river water and should be assumed to be unsafe until washed thoroughly and cooked.

Cold meat platters and creamy deserts should be avoided. Also, unpasteurized dairy products including cheese and yogurt are risks that can be avoided.

Most village markets have bananas, plantain, oranges, grapefruit, pineapple, and ground nuts in season. Native foods such as cassava (gari) and yam are available. Most Americans do not acquire a taste for these but some do. Fresh vegetables have often been washed in river water and must be cooked to be safe. Salad greens are best avoided but can be washed in a solution of 1% potassium permanganate and be safe.

Food storage is always difficult. Refrigerators are not as efficient as those used in America. The electric power is supposed to be 220 volt 50 cycle but it may vary from 150 to 240 volts and from 40 to 60 cycle. Appliances do not perform well nor last very long under these circumstances. Power outages occur often and may be prolonged. There are inexpensive regulators that can be purchased which will help. Ice, other than that made in the refrigerator, should not be used.

In some major cities there are meat markets operated by expatriates where a reasonably good quality of meat may be purchased at very high prices. The traditional meat supply is from herds of gaunt cattle which are brought from the higher plateaus and herded down the roads. When the herd reaches a moderate sized village or city there is a slaughter place. The cattle are slaughtered early in the morning and the meat thrown on wooden tables where it is immediately covered with flies. To obtain meat that is not spoiled you must send a cook or house boy to the market early with a Styrofoam cooler. He can select and purchase meat and have it in the refrigerator fairly rapidly.

Fresh fish pose special problems. Some species contain toxins which are not neutralized by cooking. Locally caught fish are suspect. Avoid large fish and do not eat internal organs.

Most missionary families employ native people to cook and serve meals. Most of these have been trained by previous families and are reliable but they should be carefully observed initially to be certain that they understand safe methods of food preparation and cooking. Often they know what to do but do not believe in them and will shortcut or ignore safe methods. This is particularly true of water purification. As an example of their attitude, the faithful cook who we have used for 23 years in Nigeria will not drink boiled water but chooses river water because "it is better."

Insect and Rodent Control

There are innumerable rats and mice in the tropics and they are more important there for rats are vectors of several serious diseases. Rat poison can be used but traps are safer if there are small children in the house. If rats are caught, they should be handled with rubber gloves.

Bats are a frequent visitor in attics and sometimes in houses. They are generally harmless but are known carriers of rabies. It is best to try to shoo them out of the house but do not try to catch them for one may be bitten.

Protection from mosquitos and other flying insects is a never-ending task. Screen wire is often not of the quality Americans are used to and tears and holes seem to appear daily. The eaves of the houses are usually open and provide access for almost anything that flies.

Effort should be made to keep screens and screen doors in repair. Mosquito netting should be provided for all beds and also kept in a good state of repair. The netting should reach the floor. Each evening an insect spray should be used under the bed and inside the netting before retiring. The anopheles mosquitos are small and nocturnal and not often seen during the day and one can develop a false sense of security. Wear shoes at all times and preferably shoes that cover the feet rather than strap sandals that are so popular.

Army or driver ants are constant problems. They have their nests in the bush and often will start out in a trail four to five inches wide with usually no apparent destination. If a house is in their path they will enter by the millions and can completely cover a room. If you step in their trail, they can cover your legs in seconds and inflict painful bites. They do not sting but have powerful jaws and have to be pulled off one by one. Getting them out of a house requires real effort. Insect spray, water and brooms are all necessary. It may take hours to get them out. If they come in at night and get in bed with a child they can be very dangerous. The best measures are to be certain that

there are no points of entry if possible and never leave food or garbage in the kitchen. The bush should be cleared at least fifty feet away from all houses.

There are several varieties of lizards which are always present in houses and on screens. They are harmless and are beneficial because of the number of insects they catch and eat.

Prevention of Malaria

100% of the native people in West Africa are infected with malaria as well as many expatriates. A considerable number of missionary personnel have contracted the disease at one time or another. Too many do not appreciate the risk nor the seriousness of malaria. Some who have ignored all precautions and have remained well for years have to their sorrow become suddenly and seriously ill. The writer traveled to see an American worker at Williams International who had been in Nigeria eight years but had never taken Chloroquine and was semicomatose with a fever of 106^0 with acute malaria. Native people who have a certain amount of immunity and who have tolerated the infection for years still die of the disease. Even a brief exposure can be dangerous. A medical student who traveled to Nigeria with the writer and who did not take Chloroquine as directed spent one night in Lagos. On the second day at the hospital he began to have chills and fever to 104^0. He spent the majority of his stay recovering.

The Falciparum variety of malaria is widespread and is often resistant to Chloroquine and most of the other commonly used drugs. Therefore it is far preferable to prevent rather than to treat.

The prevention of malaria lies in two areas. The first is to minimize the chances of infection. There are several practical measures. Keep well dressed and wear long sleeved shirts. Avoid going outdoors at night as much as possible. At night use repellant containing 30% DEET. Small children should be kept dressed and indoors in the early morning, late evening and at night. Mosquito netting should always be used and spray under the netting and under the bed at night with flying insect spray. The netting can also be sprayed with Permethrin.

The other measure is to take Chloroquine 500 mg (300 mg base) once a week beginning two weeks before travel, during the overseas stay and for six weeks following return. In areas where Falciparum is prevalent Mefloquin is recommended. It should not be taken by pregnant women nor small children. It has much more toxicity than the other drugs. The CDC currently advises that small children not enter where Falciparum is prevalent. Other drugs such as Plaquenil, Progaunil, Daraprim, and Primaquine can be used. The first two are useful for those who develop allergy to Chloroquine and Primaquine is useful in preventing relapses of P. Vivax and P. Ovale.

Resistant Falciparum infections not responding to Chloroquine in therapeutic doses may require Quinine for therapy. Also it should be remembered that Mefloquin is used for prophylaxis only.

Many fear Chloroquine because they have heard that it may cause blindness. It is true that excess doses or therapeutic doses taken too often can cause optic atrophy. Taken in the proper prophylactic dose there is no danger at all. The author has never seen a single expatriate with optic nerve damage.

Illnesses That May Be Contracted in the Mission Field

The following is a discussion of common illnesses that can be contracted by anyone, but which may pose problems primarily because medical care is limited or not available.

Gastrointestinal problems

Nausea, vomiting and diarrhea are common problems everywhere. These symptoms are frequently viral in origin but may be bacterial. This malady will involve everyone at one time or another. The ordinary is self limited and requires little or no treatment. Actually, it is better not to stop the diarrhea early for this is nature's way of getting rid of the infective agent. The stool should be inspected to see if it contains blood or pus which may indicate a bacterial or parasitical cause. Laboratory examination of the stool is in order if either are seen and if available. Nausea can be subdued with mild sedation such as Compazine which can be taken orally or rectally by suppository. If it cannot be retained, it can be given by injection. There are a number of antiemetic drugs available. (See "The Missionary's Pharmacy" in the appendix.) Diarrhea can be treated by Pepto-Bismol, Imodium or Lomotil. The average episode of gastroenteritis does not result in dehydration. It is best to stop all food intake except water or a carbonated drink. Antibiotics are not indicated.

Amebic infection can be asymptomatic or can produce mild or severe diarrhea. Amebic dysentery can be severe. The stool usually contains large amounts of blood stained mucus and frank hemorrhage is possible from the colonic ulceration. Aggressive treatment is warranted with diarrhea of this character even without laboratory confirmation. Metronidazole (Flagyl), diodoquin or tetracycline can be used effectively. Amebiasis is so common that it is not unlikely for missionary personnel to contract it.

The bacterial diarrheas include staphylococcal infection, salmonella infection, shigellosis, and cholera. Other less common organisms may be etiological. Staphylococcal gastroenteritis is the result of eating contaminated food that has had poor or no refrigeration. Contaminated food handlers may also be a source. There is a rapid onset of nausea and vomiting followed by

diarrhea. Depending on the quantity of bacteria ingested, the symptoms may be mild and self limited or at the other extreme severe toxicity, dehydration and lowered blood pressure can occur. Symptomatic therapy may be enough or fluid replacement and antibiotics may be required.

Shigellosis is a more serious illness. The etiology is drinking contaminated water. There is an explosive onset with severe diarrhea associated with tenesmus (severe cramping and urge to defecate). Toxicity and high fever are usual. The stool contains a large number of white blood cells which appear as pus. The organism should be confirmed in the laboratory if possible. Dehydration will often occur to a severe degree and will require administration of fluids orally and sometimes intravenously. Tetracycline may be effective but chloramphenicol is far superior if the illness is severe. Symptomatic medications mentioned above will also be of benefit.

Salmonella infections are very common in the tropics where poor sanitation often results in food and water contamination. The most serious varieties are typhoid and paratyphoid fever. Immunization for typhoid fever is effective if used. Fecal contamination of food and water is the cause. Initially there is a septicemic (bloodstream) phase lasting about one week at onset of fever which becomes higher each day finally fluctuating between 103^0 and 106^0. Chills and sweats are common. Reddened areas may appear on the trunk (rose spots). Gastrointestinal symptoms appear as constipation or diarrhea, and nausea and vomiting. During the third week, hemorrhage and/or bowel perforation become serious and potentially fatal complications.

Serological studies are diagnostic if available. Several antibiotics are partially effective but chloramphenicol is the drug of choice despite its hemopoietic complication risk.

Other salmonella organisms cause a more usual variety of severe diarrhea which does not have the dangerous complications of typhoid. The symptomatic treatment outlined above plus chloramphenicol will be effective.

Another, and probably the most serious disease that missionary personnel are likely to contract, is viral hepatitis. Hepatitis has worldwide distribution but is more prevalent in underdeveloped countries where water contamination is widespread and sanitary methods of food control are absent. There are a number of varieties which can be distinguished in a good laboratory which is rarely available in the mission field. Hepatitis A, B, and C are probably all present, but it will not be possible to distinguish them. There is effective immunization for hepatitis B which all expatriates should take before travel. However, since the other varieties are present and since there is no immunization for them, immune globulin is the only defense. Four to five cc given intramuscularly will produce an effective passive immunity for about four months. It should be repeated at regular intervals. Hepatitis is

transmitted by contamination of water and food by urine or feces and by personal contact. In most of West Africa, and many other areas, it is essentially epidemic. The author has seen 30 to 40 cases per month on several visits.

If the disease is acquired, the symptoms are anorexia, nausea and vomiting, jaundice and fever which will persist for two to three weeks and sometimes longer. The jaundice may subside but this does not mean that the disease is over. Bed rest, high vitamin intake and a bland, low fat diet are the only measures since there is no specific treatment. Activity should not be resumed until the liver enzyme studies have returned to normal. If these studies are not available, the sedimentation rate should be done repeatedly until it returns to normal.

Many are tempted to return to work too soon but this will only prolong the illness and result in more liver damage. Complications are hepatoma (cancer) and cirrhosis. The risk of hepatitis is reason enough to drink boiled water.

Cholera is caused by the organism Cholera Vibrio. Historically, the world has experienced many catastrophic epidemics more often in Asia and India although there have been epidemics in America in the last century. It is transmitted by fecal contamination of water and in West Africa tends to occur in the dry season when the rivers and streams are low and the concentration of contamination is high. If missionaries use the ordinary precautions with water that have been outlined, it poses no risk.

This disease is characterized by a rapid onset of painless diarrhea in unbelievable quantity. The initial loss may exceed 1500 cc. The patient can dehydrate to death in three or four hours. The voluminous diarrhea has the character of water that has had rice boiled in it.

Laboratory diagnosis is possible but the severe dehydration demand that the diagnosis be made clinically and rehydration initiated. The rehydration fluid should be a balanced salt solution but isotonic saline will be adequate. The volumes required can be estimated by measuring the quantity of the stool, by the blood pressure and by the clinical signs of dehydration. The amount of fluid required will be in excess of expectations and may require several liters per hour in the adult. Two intravenous cannulae should be used. Oral administration of a balanced salt solution can be given but in this case can only supplement intravenous fluids. The oral fluid can be made up by anyone and the formula will be given in the appendix "The Missionary's Pharmacy."

Those who develop a diarrheal disease which does not respond to symptomatic measures and which is accompanied by signs of toxicity, high fever and dehydration must try to obtain medical help. At the end of this chapter is a list of drugs and supplies which the author believes should be kept on hand. These are particularly important where there is no doctor or nurse available.

A few abdominal diseases that the missionary should be aware of are mentioned here.

Peptic ulcer disease should be uncommon in people who neither drink nor smoke, but under stressful conditions it may occur. The typical symptom is epigastric pain appearing two to four hours after eating and which is relieved by eating or by taking antacids. Diagnosis requires either gastroscopy or a gastrointestinal series of x-ray studies. These symptoms require the help of a physician. Until that can be accomplished the diet should be modified to a bland, fat-free diet and the taking of antacids such as Maalox or Tums every two hours or one of the newer drugs such as Tagamet, Zantac and Priolec. As stated, this should be a rare problem.

Appendicitis can occur at any age but is most common in the young adult. The symptoms may vary and at times be quite atypical but there is usually an onset of mid-abdominal or epigastric pain which is constant and after a few hours shifts to the right lower quadrant. Tenderness will develop which is quite localized and increases in severity. Anorexia, nausea and vomiting are usually present. The temperature will ordinarily be in the range of 100^0 to 101^0. Rupture rarely occurs in the first 24 hours, except in small children and the aged. These symptoms and findings require surgical help as soon as possible. If there is delay in getting medical help antibiotics should be started. Tenderness which becomes generalized and severe pain suggests that rupture has probably occurred.

Acute cholecystitis (gallbladder infection) primarily occurs in those over 35. There may be a history of a previous episode or of gallstones. There is a gradual onset of right upper quadrant pain which is constant and may radiate to the back. This will be accompanied by anorexia and sometimes nausea and vomiting. The temperature will usually be in the range of 102^0 to 103^0. Progression without treatment will result in more severe pain and higher fever. The gallbladder may rupture with the development of an abscess or peritonitis. Again medical help should be sought as soon as possible.

Gallstones are universal in people who have gallbladder disease. Occasionally, one or more stones will pass into the common bile duct and lodge at the site where the duct empties into the small intestine. This obstructs the flow of bile resulting in severe colic-like pain and jaundice. If this is allowed to go untreated, liver damage can also occur. This problem also requires expert medical help from a gastroenterologist and usually a general surgeon.

Acute colonic diverticulitis is a complication of diverticulosis which involves at least 10% of people over 50. The diverticula are chiefly in the left colon. Fecal material getting impacted in one of the little sacs can result in acute infection. The disease has an onset very much like that of appendicitis

except that the pain and tenderness are in the left lower quadrant. Low grade fever usually develops. If neglected, the disease may progress to perforation with peritonitis or abscess formation. Hemorrhage is also an infrequent complication. Medical help should be sought and Cipro and Flagyl should be started. Prevention of diverticulitis is usually possible in those who have diverticulosis by staying on a diet free from lettuce and cabbage and avoiding constipation by taking a bulk laxative such as Metamucil twice daily.

Another common problem in those over 35 (and sometimes under) is development of colon cancer. The simplest test available is the use of treated paper (Hemocult) or other similar products. A small amount of stool can be placed on the sample card. Three or more are collected which are then taken or mailed to a laboratory. This detects small amounts of blood in the stool. A positive test or gross blood in the stool requires specialized studies such as barium enema, sigmoidoscopy or colonoscopy. Travel to the US is indicated.

Other findings referable to the abdomen which suggest that medical consultation is need are localized pain and/or tenderness, the detection of a mass and any change in bowel habits that is more than temporary.

Respiratory Problems

People in the mission field are subject to the same respiratory diseases as they are at home. There are no specific diseases peculiar to the tropics with the exception of the pulmonary problems related to hookworm, ascariasis and paragonimiasis.

The common cold, laryngitis and bronchitis are no different than in America but will occasionally result in illness. One problem that some have is fear of illness when they are isolated far from home and have limited medical resources.

Viral and bacterial pneumoniae are always possible and when there is a respiratory illness which develops fever over 100^0 for more than 24 hours this is a possibility. Chest pain that is aggravated by breathing indicates that the pleura (the covering lining the chest wall and covering the lung) is inflamed. These symptoms are sufficient to begin antibiotics and to seek medical help. Ampicillin 500 mg three times daily is a good empiric approach. For those allergic to penicillin, erythromycin in the same dosage is satisfactory. Acetaminophen (Tylenol) 325 mg every four to six hours, a cough syrup such as Robitussin and throat lozenges will be helpful. For a severe sore throat gargling warm saline every two to three hours will give some relief. Nasal congestion and discharge can be helped by taking an antihistamine.

Medical help should be obtained if fever continues or becomes elevated over 103^0 or shortness of breath develops. A complication of pneumonia is a spread of infection into the pleural space (empyema) which may require aspiration or surgical drainage.

Bronchial asthma is a common problem everywhere. Severe asthma probably should be reason to avoid service in the tropics. Asthmatics often have more difficulty in tropical areas than in America. Asthma is erroneously thought by many to be of allergic origin whereas allergy is actually involved in a minority of patients. In the tropics, the high humidity favors an excess of molds and fungi which in allergic individuals can cause trouble. Also, the Harmattan (dry season) in Africa with its high dust level results in many native people presenting with severe asthma when they are not bothered with it at other times of the year. Probably the best advice is to carry a full supply of the drugs that are being taken as prescribed by a physician. Asthma will usually respond to bronchial dilators such as aminophylline and nebulized agents. There is always the possibility that a severe episode will occur which is not responsive to the usual medications. Sometimes there is a bacterial infection which will require antibiotics. A severe episode may require short-term steroid therapy. *Asthmatics must not take steroids on a long term basis or become steroid dependent.* Short-term treatment consists of taking prednisone 5 mg tablets; six should be taken in divided doses the first day, five the second, four the third and so on until the drug is stopped at five or six days. This regimen should not be repeated more often than at four month intervals. Increasing severity or failure of the above approach should be reason to return home.

Tuberculosis is mentioned because it is endemic in all Third World countries. Most mission personnel use native people as cooks and house boys and are in fairly close contact with them. Also, they are often used as baby sitters for small children which are much more vulnerable to the infection.

Unless there are symptoms such as a chronic cough or obvious weight loss there may be no reason to suspect the diagnosis. It would be best to have chest x-rays of all personnel but this is either impossible or impractical. Therefore, the missionary must be ever wary of symptoms of chronic pulmonary illness and insist on an x-ray.

Genitourinary System and Breast Problems in Women

There are no female specific diseases peculiar to the tropics. There is widespread belief, although little proof, that white women have more menstrual irregularities and menstrual bleeding than in temperate areas.

Carcinoma of the cervix is an ever present threat. One should have a pelvic examination and cervical cytological smear done prior to travel so there should be no immediate fear. Women should have an annual examination and smear even if considerable travel is involved. Spotting of blood on underclothing is the earliest symptom and must not be ignored. Bleeding in more quantity may be from benign causes or may be from a

tumor inside the uterus. Examination, smears, biopsy and dilatation and curettage may be indicated.

Pelvic examination must be done regularly to detect tumors of the ovaries which will not be felt through the abdominal wall until they are quite large.

Cystitis (inflammation of the urinary bladder) is a common malady in women of all ages but more common in the child bearing years. Symptoms are: frequency, urgency, supra pubic pain and burning on urination. The diagnosis is confirmed by finding pus in the urine from a catheterized specimen. Contamination with vaginal secretions makes a voided specimen unreliable. Treatment consists of forcing fluids up to three quarts daily and the use of a urinary antiseptic or antibiotic.

Urinary infection may spread to the kidney (acute pyelonephritis). The illness is more serious and is characterized by chills and fever and pains in the mid-portion of the back on either or both sides. Unless there is some urinary obstruction, the disease responds to antibiotics rapidly.

Cancer of the breast is the most common malignancy in women. It even occurs in women in their thirties. Mammography should have been done prior to travel. This procedure will not be available in Third World countries. The only method of detecting a tumor in the breast under these circumstances will be self examination and periodic examination by a physician. Manual examination will usually detect a tumor as small as two centimeters unless the mass is deep in the breast or if the breasts are large. Women should learn the technique of self examination. A tumor in the breast in women under thirty is usually benign. Multiple nodules, particularly if they are painful, most often represent chronic mastitis. There are no reliable ways of determining malignancy except by biopsy. Any mass that appears should have a biopsy done. This should not be done except by a surgeon capable of performing definitive surgery. Generally, this means returning home for the biopsy. Even in women with multiple nodules of chronic mastitis, cancer can develop. A bloody nipple discharge is also a sign of probable malignancy. It cannot be stressed too firmly that any mass in the breast must not be neglected.

Surgical resections have a very high percentage of cures (80%) if the operation is done before the tumor invades the chest wall, skin, axillary lymph nodes or spreads to a distant organ.

Genitourinary Problems in Men

Acute urinary infections in men can involve the urethra, bladder, prostate and seminal vesicles, or the kidneys. The most common source of urethritis is gonorrhea which will not be discussed. Nonspecific infections are also common. Urinary frequency, urgency and burning on urination are the

usual symptoms of urethritis and cystitis. The urinalysis will reveal large numbers of white cells and a smear and culture will demonstrate the offending organism. The management consists of forcing fluid intake and administration of a urinary antiseptic and/or antibiotics. Unless the prostate gland or the kidney is involved this treatment will usually be adequate.

Acute and chronic prostatitis can be difficult to manage. The source of infection is usually urethritis and cystitis. The prostate has comparatively little blood supply and it is difficult to obtain a high tissue antibiotic level. There will usually be symptoms of urgency, frequency, and burning but these may have already subsided. The onset of prostatitis is a flu-like syndrome with fever, perineal and back pain. The diagnosis is usually confirmed by examining prostatic secretions obtained by prostatic massage. The prostate will also be tender and painful during massage. Antibiotic therapy and periodic prostatic massage is usually effective in acute infections, however, chronic prostatitis is slow to respond and recurrences are common. Prolonged antibiotic is necessary.

Benign prostatic hypertrophy (enlarged prostate) occurs in most men as they grow older. Some will have little or no difficulty but others will have progressive obstruction of the urinary passage at the neck of the bladder. The symptoms come on slowly but are those of obstruction and are difficulty in starting the urinary stream, slowness of the time it takes to empty the bladder, urgency, and sometimes incontinence. As the symptoms worsen, the patient becomes unable to empty the bladder completely. Finally he is able to urinate only a small amount frequently while the bladder remains full. Complete obstruction does occur requiring emergency catheterization. This process requires the services of a urologist and surgery is often necessary. In the mission field, if these symptoms develop, the patient should seek surgical help before serious obstruction occurs. A complication of the latter stages is kidney damage.

Prostatic cancer is very common in men over 45 and is now the most common malignancy in men. There may be no symptoms for months. Obstructive symptoms can occur. An annual PSA blood test is the only method of early diagnosis. A positive test calls for ultrasound study of the prostate and usually needle biopsy. MRI, CT scan and bone scans are indicated once a diagnosis is made. None of these studies can be done in the mission field. Surgery, radiation and hormonal therapy are possible modes of treatment. Men above 45 should seek, if it is at all possible, to have an annual PSA test.

Urinary stones (calculi) are usually formed in the kidney and enter the ureter which goes to the bladder. They may lodge temporarily or permanently. The result is a sudden onset of extremely severe colic like pain in the flank and back on the affected side. This pain is excruciating, disabling and cannot

be relieved by any medication short of complete anesthesia. The diagnosis can be fairly accurately made by the type of pain and by finding red cells in the urine. Specialized studies and x-rays which require a urologist are necessary to confirm the diagnosis and to remove the stone if it does not pass spontaneously. This is a problem that is common to young adults but which can happen at any age.

Dermatological Conditions

The last area to be mentioned is the area of skin diseases. They are common in the tropics but are not peculiar to those areas. Only a few of the more common ones will be mentioned.

One universal problem is lice. They occur worldwide but are prevalent where poverty and poor personal hygiene exist. There are three varieties: head lice, body lice and pubic lice which are all very similar. There is matting of the hair in the case of head lice and a rash can be seen. The nits (egg pods) can be seen attached to individual hairs. There is some itching and there is a fetid odor. Body lice produce reddish papules with intense itching. Pigmentation can occur if the infection becomes chronic. Pubic lice are similar to head lice except that the principal symptom is intense itching.

If no medical help is available, a simple magnifying glass will show the tiny insects which resemble a crab. Treatment is the use of Kwell or Eurex. Clothing must be adequately cleaned to prevent re-infestation. The treatments should be repeated after 10 days to kill those which were hatched after the initial treatment. In the case of head lice, if one child in the family has the problem others usually do, therefore, you should treat all members of the family.

Scabies which has been termed the seven-year itch is caused by a mite and is a worldwide problem. The parasite burrows under the skin and the tract is usually visible. There is a chronic dermatitis. Diagnosis is obvious to a physician, but may not be apparent to the lay person unless they have seen the disease before. Benzyl benzoate, Kwell and Eurex are effective drugs. Again clothing must be sterilized.

One of the common problems that new missionary personnel encounter in West Africa is red, itching lesions that resemble the common chigger bite. There is intense itching. They are principally on the legs but may involve the lower trunk. These are sand fleas. After about two weeks the lesions disappear and do not recur. Apparently an immunity of some variety is developed.

Fungus infections are very common. Athletes' foot (tinea pedis) is common and most people will recognize the infection. Prevention is possible by not walking barefooted in wet areas such as bathrooms and showers. Keeping the feet dry, wearing clean socks and powdering the feet with Desenex powder are helpful measures. The infection usually responds to Desenex

ointment applied to the area. Tinactin is also effective. Remote skin sensitization with small itching vesicles is common and will disappear when the primary infection is controlled.

Ringworm of the scalp (Tinea capitis) is characterized by scaling dermatitis, lackluster hair which tends to break off and areas of alopecia (loss of hair) are typical. Griseofulvin is an effective antifungal agent for this disease. The dose is 500 mg per day in four divided doses. For children, 250 mg is sufficient.

Favus (tinea favosa) is a fungus infection of the scalp and also of the non-hairy parts of the body and fingernails in children. It is characterized by yellowish crusts which when removed leave a bleeding superficial ulcer. Griseofulvin is the treatment of choice.

Ringworm (tenia corporis) is a superficial fungus infection that has an eczema like appearance. It can become chronic developing granulomatous, encrusted lesions. Itching is fairly severe. Treatment can be by any of several drugs although the disease is usually self limited but will persist several months. Useful drugs are Talnaftate, Haloprogin, Griseofulvin, and Thiabendazole.

Tenia cruris (ringworm of the groin, crotch rot) is a very uncomfortable fungus infection. Any of several fungi may be the etiology. The scaly, reddened rash appears on the medial surface of the thigh near the groin and may involve the scrotum, the perineum and the lower abdominal wall. Rarely the axilla is involved. Nystatin and Haloprogin are specific for therapy.

Pityriasis is a very common fungus infection characterized by yellowish brown, irregular patches over the skin of the shoulders, chest, back, and sometimes over the upper abdomen. The lesions are scaly. Healing is followed by irregular, partial depigmentation which persists for weeks to months. Several preparations are available for treatment.

1. 15% solution of sodium hyposulphate.
2. Pragmatar ointment.
3. A 3% sulphur and 3% salicylic acid in petrolatum applied at night.
4. Selenium sulphide (Selsun) 1% solution applied each night.
5. Daily baths and removal of all crusts.

Otomycosis is a troublesome and painful fungus infection of the external ear canal. It is very common in the tropics and often becomes secondarily infected. Secondary bacterial infection may require antibiotics. The fungus can be managed by cleaning the ear canal with a Q-tip saturated with peroxide solution followed by application of a 3% salicylic acid or 12% silver nitrate solutions. 70% alcohol can also be used.

Larval migrans is a subcutaneous invasion by the larva of animal parasites usually the dog tapeworm. An erratic small track can be seen. It is pruritic.

It is self limited and requires specific treatment. It is best to prevent the disease by fencing the play yards of children and by keeping children dressed. They should not be allowed to play where the soil is moist and sandy just as in hookworm prevention.

There are many other problems some of which are described in the chapter on parasitical infections.

Despite this long list of maladies missionary personnel can, and should, remain well and free from major diseases if they will observe the common preventive measures described.

WHY DIDN'T THEY TELL ME THERE ARE SO MANY TROPICAL DISEASES?
'97

Chapter 10

Infectious and Parasitical Diseases in the Third World

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Introduction

This section is divided into four parts: Parasitical Diseases, Viral Diseases, Bacterial Diseases and Rickettsial Diseases. It is obvious that missionary personnel are not going to engage in medical practice except in the context of the backyard clinic. However, these groups of diseases are important in underdeveloped countries where missionaries work. There are risks of missionaries contracting a number of the diseases and they will see many native people infected with them. It should be of help to understand what is contagious and what is not. It is important to know how they are transmitted or contracted. A knowledge of tropical medicine even though limited should enable the missionary to not only protect his health and that of his family but should help him to understand the problems his subjects have and the burdens they bear. Also, in the backyard clinic setting, with some understanding some diseases may be treated and one may be able to recognize critical problems and help these individuals to obtain medical help.

At the end of each section there is a paragraph "For the Missionary" which summarizes the facts and measures important to missionary personnel.

This section, while appearing to be detailed, actually presents only a brief statement about each disease. It is hoped that this section may serve as source material so that nonmedical people may become conversant with these diseases that are prevalent where they are. If nothing else, the author hopes that it may provide adequate warnings and at the same time allay unnecessary fear of disease.

Not all, in fact only a few, of these disease states will be found in any one local. In the appendix section there a table of the geographic distribution of disease in the world. Even in any one country the diseases are uniformly distributed but will vary for a number of reasons. Local inquiry of medical facilities will help to know what problems are present in a particular area. A brief bibliography is appended at the end of this section. Much of the material recorded here has been obtained from these sources.

Parasitical Diseases

There are literally dozens of parasitical diseases which occur in many places in the world. The majority, but not all by any means, occur in the tropics. A hundred and fifty years ago parasitical infections were common in the United States particularly in the southern tier of states. They are almost nonexistent today because of the extensive public health measures that have been carried out. In the Third World poverty, ignorance and the lack of effective public health activity permit many of these diseases to remain unchecked and destroy thousands of lives each year and making life miserable for millions.

Some of these diseases may seem to be of little importance, however, some are transmissible to man and pose varying degrees of seriousness. The life cycle of most are rather complicated but serve to show how they can be controlled. Some of these life cycles will be illustrated to make understanding simple. This chapter can be nothing more than a very basic primer. For those interested, there are several comprehensive textbooks available which are listed in the bibliography. Also at the end of this book is an abbreviated geographical list of parasitical diseases so that the reader will have a general idea about those diseases that are likely to be present in the area to which he or she is going. The author apologizes for the use of names and medical terminology but he could not find common words to convey the meanings that were important.

Only those parasitical infestations that are most important will be described.

Malaria

Malaria is the most important tropical disease in the world as far as mortality, morbidity and money spent. This may not be true much longer if the AIDS epidemic continues to grow. It is widely distributed in all of the tropical areas of the world. It is an interesting fact that the disease is not endemic where the mean temperature is less than 54 degrees. The life cycle is complex. The mosquito is an obligatory host not just a vector. There are four varieties: P. Falciparum, P. Vivax, P. Ovale and P. Malarie. The falciparum is the most wide spread and is the most dangerous and the hardest to treat effectively. Only the falciparum life cycle will be discussed, the others being similar. The parasite has an asexual, endogenous cycle in man and a sexual, exogenous cycle in the anopheles mosquito. The process is initiated by the injection of sporozoite into man by the mosquito. These disappear from the bloodstream almost immediately and appear in liver cells. After a variable interval mature schizont develops. The liver cell ruptures releasing a large number of merozoites which may reenter other liver cells and repeat the process or invade red blood cells. The cycle in the red cell is also complex,

but results, again, in the production of mature schizonts which rupture releasing a myriad of merozoites. These may reenter a red cell and cycle again or develop into mature male and female gametocytes. These are aspirated from man by the mosquito and immediately the male fertilizes the female in the stomach of the mosquito. This results in the production of multiple oocytes which invade all of the mosquito's tissues. Some enter the salivary glands and progress to the sporozoite stage where they can be injected into man beginning the cycle over again.

The clinical course varies depending upon which species is involved and the magnitude of the inoculation. Mixed infections are possible. The course of the falciparum is the most severe and can be quite fulminating, The characteristic cycle of chills and fever seen in the vivax infestations is less regular and more prolonged in falciparum infection. If the disease is not recognized and treated promptly the disease can become serious and can even be fatal. Complications include treatment failure, relapse, cerebral involvement, liver and spleen damage, and blackwater fever. The fulminant form is sometimes referred to as malignant malaria. Blackwater fever results when there is extensive hemolysis of red cells which can produce blockage of renal tubules by red debris and bile pigment resulting in acute renal insufficiency (kidney failure).

Diagnosis can be presumptive based on the typical clinical course and can be confirmed by a blood smear stained with gram stain. Considerable expertise is required of the laboratory technician to consistently find the parasite and determine which variety is present.

Therapy of an acute attack in a non-immune subject consists of several regimens. Chloroquine 600 mg base followed by 300 mg base six hours later and followed by 300 mg base daily for three days. For resistant falciparum disease, quinine 650 mg of the salt three times daily for seven to ten days. In the native semi-immune subjects give Chloroquine 600 mg single dose or amodiaquine 600 mg single dose or quinine 1.0 to 1.5 gram salt daily for two to five days.

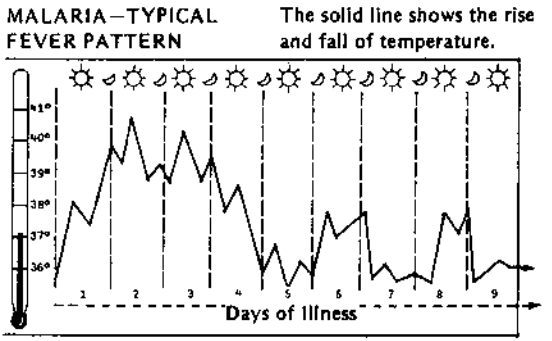


Figure 10-1. From: *Where There Is No Doctor, A Village Health Care Handbook*, page 26.

Prophylactic suppression requires continuous therapy

beginning two weeks before entering a malaria area and continuing for 4-6 weeks after returning home. The most common regimen is Chloroquine (Aralen) 500 mg weekly. Pyrimethamine, one tablet weekly. In falciparum areas the Center for Disease Control recommends mefloquin weekly. One must remember that mefloquin is more toxic than Chloroquine and is contraindicated in pregnant women and small children. Fansidar has also been recommended for falciparum but in Nigeria has proven to be not very effective. Paludrin and primaquine are recommended to prevent relapses after therapeutic treatment.

Many missionaries have been fearful of blindness as a result of Chloroquine therapy. The author has seen several Nigerians with optic atrophy as a complication but all of these have self treated themselves with excessive doses for many years. I have never seen an expatriate with any complication other than itching, rash or urticaria as an allergic response. The risk is essentially zero if the drug is not abused.

Amebiasis

There are several protozoan intestinal organisms that are classified as amoebae. E. Histolytica is the most important one of the group and is the one producing the disease amebiasis. This and the other parasites are contracted by the ingestion of fecally contaminated water and food. The parasite is ingested in the cyst form which has been expelled in feces previously. Fly transportation is possible. The cysts open in the intestine releasing several nuclei into the bowel and develop into the trophozoite form which the motile form. The motile form assumes a slug-like shape. The organism penetrates the colonic mucosa producing early superficial ulceration. Submucosal abscesses then form. Deep ulceration with necrotic edges follows. Secondary bacterial infection may produce varying degrees of acute inflammation. Shigella and clostridia may be among the bacterial invaders. Severe colitis, gangrene, hemorrhage, and perforation may all result. Invasion of the mesenteric vein will result in the organism being carried to the liver via the portal system. In the liver single or multiple abscesses may develop. Some of these can become very large (500 - 1500cc). These abscesses may perforate into the peritoneal cavity or more likely will erode through the diaphragm and enter the pleural space or the lung. If the pleural space is the choice then a large empyema (collection of pus) will result which directly connects with the abscess cavity. This represents a surgical emergency and requires drainage. The abscess erodes directly into the lung and enter a bronchus in which case the patient begins to cough up the contents of the liver abscess. Liver abscesses are common, at the Nigerian Christian Hospital five or six will be seen each month.

More often dysentery is the clinical picture. It may be associated with hemorrhage. Sometimes there are alternate episodes of diarrhea and constipation. It is also possible to develop the infestation and remain largely asymptomatic. Diagnosis is suggested by diarrhea in which the stool contains excess mucus which is blood stained. A liver abscess may be suspected in a patient who has a long history of diarrhea and develops a painful enlargement of the liver associated with fever. The diagnosis is confirmed by finding motile trophozoites or cyst in the stool. In an abscess the contents rarely contain ameba but they can be found in the wall of the abscess.

Other than liver abscess, the amoebae can be carried to the brain and produce a brain abscess. A lung abscess occasionally occurs. Peritonitis, appendicitis and rectal and anal fistulae also occur.

Treatment has been revolutionized by the development of metronidazole (Flagyl). 400 mg daily in divided dosage is recommended. Diodoquin 600 mg tid is recommended for mild dysentery. Tetracycline 500 mg three times daily is also effective. For severe amebic dysentery and liver abscess emetine is still the preferred treatment given in combination with Flagyl. 65 mg by injection daily is given. The electrocardiogram, if available, should be followed daily for signs of myocardial toxicity. Other than malaria, amebiasis is the infection most likely to be contracted by missionaries.

The other intestinal protozoans which can cause disease include: Giardia lamblia, Endamoeba coli, Endolimax nana, Iodamoeba butschlii, dientameba fragilis, and balantidium coli. Giardia is the most likely to cause intestinal disease. Treatment is the same as for E. Histolytica.

Filariasis

Filarial infestation represents at least five separate parasites which have worldwide distribution in tropical climates. Only three of these are significant diseases. Filaria are nematodes or worms which dwell in tissues of the body. Wucheria bancrofti is widely endemic. The parasite is vectored by several varieties of mosquitos. There is an exogenous cycle in the mosquito. The mosquito ingests the microscopic microfilaria from the peripheral blood of man. The parasite then undergoes a complex metamorphosis which results in a filiform larva which occupies the mouth parts of the mosquito and then enters the puncture wound of the mosquito or penetrates the skin directly. The parasite migrates to regional lymphatic vessels and nodes where it lodges and develops into the adult worm.

A severe inflammatory response ensues that obstructs the lymphatic flow which in later stages is sufficient to cause severe chronic edema of the lower extremities and scrotum that has been termed elephantiasis. The extent of the disease depends on the number of mosquito bites and how closely

together they are grouped. The inflammatory response is sometimes added to by secondary bacterial infection. The extreme edema causes the legs and scrotum to become several times their normal size and immobilizes the victim.

Diagnosis in the later stages is obvious. Early it is established by finding the microfilaria in a thick blood smear which has to be collected at night, preferably near midnight since the organism is nocturnal.

Treatment consists of administration of Diethyl-carbamizine 200 to 300 mg daily for ten days. Severe allergic response to the dying microfilaria may result which can be alleviated by the simultaneous administration of an antihistamine. The treatment eradicates the microfilaria and may injure the adult worm but the chronic edema is irreversible.

The second form, which predominates in West Africa, is Loiasis caused by L. Loa. This disease in Nigeria involves about 50 to 65% of the population. It is transmitted by the bites of tabanid flies. The insect cycle is similar to that described above. In man the adult worms in the tissues are not limited to lymphatics but migrate through the tissues indiscriminately at the rate of about one cm per second. They lodge anywhere producing a localized swelling or nodule termed calabar swellings. These may involve the eye. A complication of Loiasis are bacterial deep muscle abscesses requiring drainage.

The clinical picture, in addition to the swellings, is low grade fever, itching and visual impairment. Other allergic responses are common. Diagnosis can be established by identifying the microfilaria in a thick blood smear. They are present all of the time and are readily seen. The treatment is the same as that of Wucheria bancrofti.

The third variety of filarial disease is onchocerciasis and is known as river blindness in Africa. The disease is caused by O. Volvulus which is transmitted by several varieties of black flies. The insect cycle is similar to the two above. A rash appears at the site of the fly bite. The parasite becomes widely distributed throughout the body via the blood stream and encapsulates forming inflammatory nodules. In the eye, symptoms begin with conjunctivitis followed by corneal congestion, iritis, more extensive inflammation and corneal opacification. Blindness is common. Treatment is the same as for other forms, however, one must be cautious for the allergic response may result in additional eye damage.

Hookworm

Hookworm disease is worldwide, particularly in the tropics, and is a major cause of malnutrition, vitamin deficiency and anemia in children. The life cycle begins with the passage of eggs in the stool. In areas where there are no latrines or sewage facilities, the eggs thatch in warm moist soil. The larvae produced go through several stages of metamorphosis and finally

larvae are produced which can penetrate the skin directly. They enter the peripheral blood stream and are carried directly to the lung. They enter the alveoli or air sacs and migrate up the bronchi to the pharynx and are swallowed. When they reach the duodenum (the proximal small bowel) they attach themselves to the mucosa of the bowel and begin to feed by aspirating blood. Eggs begin to appear in the stool about five weeks after infection. The adult worm is from eight to 13 mm in length and is easily seen.

Infected individuals may remain asymptomatic with only a few parasites and just become carriers. Hookworm disease occurs where there are large numbers of worms. Pathological features include an inflammatory rash at the site of entry which lasts about two weeks. Migration through the lung produces a variable degree of pneumonitis which can be mild or severe. Fever and cough are usually present. The cough has a unique sound and is easily identified by experienced people as a "hookworm cough." In the intestine, damage to the intestinal wall may be severe and sufficient to produce epigastric pain. Each worm can aspirate approximately .06 ml of blood per day. When there are thousands of worms it is not difficult to see how malnutrition and anemia occur. The anemia is often compounded by malaria, iron deficiency and malnutrition.

The diagnosis can be suspected by the cough, anemia and obvious malnutrition and a typical "pot belly." Diagnosis is confirmed by finding the ova or eggs in the stool. It is common for one individual to have simultaneous infestation with Ascaris and whipworm.

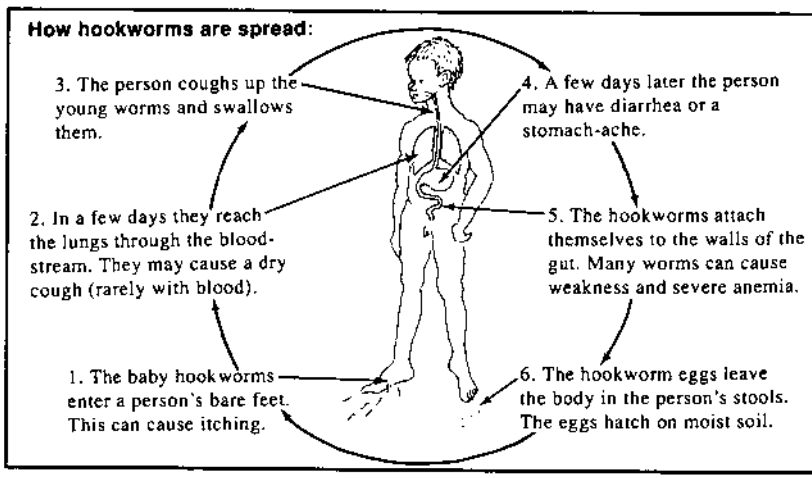


Figure 10-2. From: *Where There Is No Doctor, A Village Health Care Handbook*, page 142.

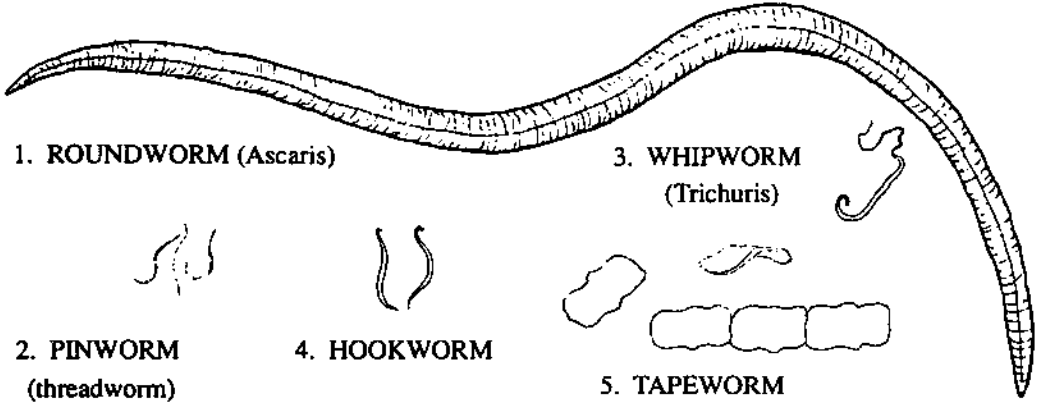


Figure 10-3. From: *Where There Is No Doctor. A Village Health Care Handbook,* page 140.

Treatment consists of administering one of several drugs including Mebendazole, Pyrantel pamoate, piperazine citrate, and Biphenium. The treatment is very effective but reinfection is almost immediate and, therefore, is temporarily palliative only.

Ascariasis

Ascaris (Ascaris lumbricoides) is another intestinal worm also known as large round worm disease. It has the same distribution and incidence as hookworm and often coincides in the same individual. The worm is three to five mm in diameter and from 20 to 30 cm long. The eggs pass in the stool and may contaminate hands or vegetables and are swallowed to begin the cycle again.

The cycle begins with the hatching of eggs to produce larvae which penetrate the intestinal wall and are carried to the lung. As in hookworm, a large number can cause severe pneumonitis. The larvae molt twice and double in size and finally enter the bronchi. They migrate to the pharynx and are swallowed. The cycle requires about two months. It is common for an adult worm to be coughed or vomited up. They reside in the lower small intestine primarily and because of their size can cause partial or complete bowel obstruction. Abdominal pain and symptoms of obstruction are not uncommon. Symptoms often suggest appendicitis to the inexperienced doctor.

Treatment is similar to hookworm and includes Pyrantel pamoate (Anitminth), Mebendazole (Vermox), Biphenium (Antepar), Levamisole, and thiabendazole (Mintezol). Reinfection readily occurs.

Whipworm (Trichuris trichiura) is also common and has the same distribution as the parasites just discussed. The life cycle is similar to that of Ascaris. The adult worm, which is about twenty mm in length, resides in the terminal small bowel and cecum. Many patients have no symptoms but if the infestation is heavy, abdominal pain and diarrhea do occur. The treatment is the same as for Ascaris.

Pinworm (E. Vermicularis)

This tiny parasite is the most widely distributed one in the world. It is doubtful that any children escape infection at some time. The worm involves the skin of the anus and the mucosa of the terminal rectum. It causes no disease process and the only symptom is itching. Any of the drugs mentioned above will be effective but because of the eggs which will be found in clothing, towels and sheets reinfection is common. If one member of the family is infected others will be also. Good personal hygiene is the best preventive measure.

Tapeworm

Tapeworm disease involves infestation of one of several species. The beef tapeworm and the pork tapeworm are the most common, however, in endemic areas hydatid disease and Diphyllobothrium are important diseases. The beef and pork tapeworms are entirely caused by eating infected, inadequately cooked beef or pork. Man is the definitive host. The adult worms are attached to the mucosa of the intestine. They produce thousands of eggs which pass in the stool contaminating the soil. Cattle or pigs ingest the developing eggs. The developing larvae penetrate the bowel wall and are carried throughout the body lodging in various tissues, predominately muscle. When infected beef or pork are eaten the parasite can either develop into a mature worm and attach to the bowel wall or can penetrate and disseminate in tissue as in the intermediate host.

The tapeworm produces no significant disease in the intestinal form. The passage of long segments several feet in length is disturbing to patients. The form, cysticercus cellulosae where the parasite is distributed by the blood stream to all areas of the body and small nodules develop. Unless the central nervous system, the eye or the heart are involved the disease is not serious. Central nervous system involvement can produce serious symptoms like any space occupying lesions would.

Treatment by any of several drugs is effective but should be followed by a laxative. Quinacrine and Mebendazole are both very effective.

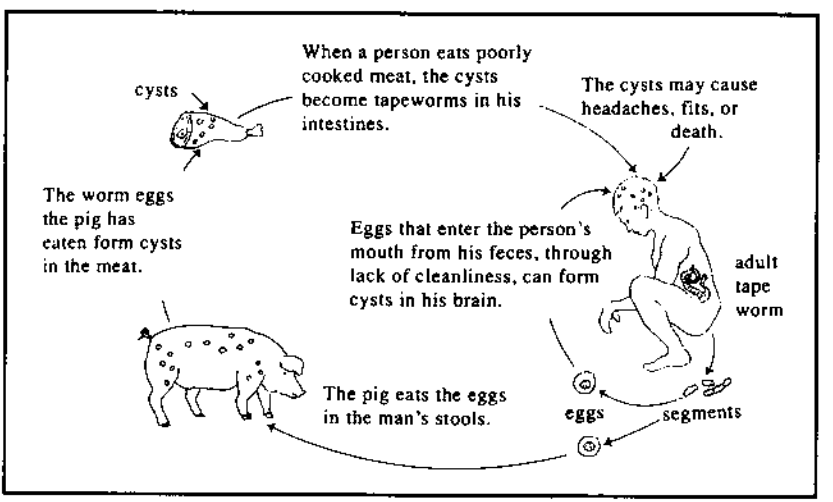


Figure 10-4. From: *Where There Is No Doctor, A Village Health Care Handbook*, page 143.

Hydatid Disease

Hydatid disease is wide spread in the Third World. This parasite (Echinococcus granulosis) is a small tapeworm in which the dog or other carnivores are the definitive hosts. Man is an abnormal intermediate host. Man ingests the eggs which result in the larvae penetrating the bowel and become widely distributed. A hydatid cyst develops where the parasite lodges. Cysts may develop in bone, liver, lung and in the omentum and peritoneum. These cysts sometimes become very large and require surgical excision. Diagnosis is usually made when a mass develops in an individual who has been in an endemic area. The radiographic picture is usually diagnostic. Precipitin and complement fixation test are reasonably accurate. There is no treatment other than excision of the cysts.

Schistosomiasis

Schistosomiasis is caused by a group of trematodes. S. Mansoni occurs chiefly in the tropics of Africa and the eastern area of South America. S. Hematobium is primarily African. S. Japonicum is limited to the Far East. The cycle of S. Mansoni will be discussed. The life cycle is one of the most complex. The eggs are deposited in the stool or urine and reach water in which the eggs hatch producing a miracidium which is a free swimming larva. The larva must reach its intermediate host – one of several varieties of fresh water snails – within six hours. In the snail, the miracidium is transformed into a mother sporocyst which in turn produces many daughter sporocysts. These migrate to the digestive organ where they produce hundreds of thousands of fork-tailed cercariae which escape from the snail. The snail cycle requires four to six weeks.

The cercariae are free swimming and can enter man by direct penetration of the skin or by being ingested. Within twenty-four hours the parasite enters the lymphatics and veins and are carried to the lung. In the lung they enter pulmonary vessel and migrate to the portal (liver) circulation where they mature. They then migrate to the mesenteric veins near the mucosa of the bowel and the bladder where eggs are deposited. The eggs secrete an enzyme which produces necrosis of the vessel wall and adjacent tissue releasing the eggs into the lumen of the bowel and bladder and exit the host.

The clinical disease consists of dermatitis at the site of penetration which itch severely; Katayoma fever is an acute illness consisting of fever, malaise, abdominal pain, extensive urticaria, cough, and diarrhea. The chronic form can be correlated with the intensity of infection and includes obstruction of the vein leading to the liver, enlargement of the spleen, cirrhosis of the liver, tissue abscesses, thickening of the bowel and

bladder wall, fibrosis of the lung, and a form of heart failure. Diagnosis is made by finding eggs in the stool or urine or by recovering eggs (ova) by biopsy of the rectum and lower colon. There is a serological test and a skin test both of which are fairly accurate.

Treatment involves the use of several antimony compounds which are effective in the acute form but of limited value in the chronic form. The prevention is simple—avoid wading, swimming and drinking un-boiled water where the disease is endemic.

Flukes

Clonorchis sinensis, the liver fluke, is limited to the Far East. The life cycle involves three hosts. The adult parasite resides in the liver, the ova pass down the bile ducts and are passed in the stool. The eggs infect fresh water snails and develop sporocytes which generate rediae that become cercariae. They penetrate under the scales of a number of freshwater fish. Metacercaria develop in the musculature of the fish. Eating raw fish allows the immature flukes to ascend into the bile duct and mature. Significant liver damage is a result of heavy infestation.

Diagnosis is made by finding the ova in the stool of the victim. Treatment is administration of Hetol 50 mg/kg/day for 5 to 12 days. Dehydroemetine and Niclofolan are also effective.

Fasciolopsis buski is the intestinal fluke. The disease is primarily Asiatic and Far East. The adult resides in the intestine. Eggs pass in the stool which contaminate ponds. Miracidium are produced from the egg and then invade a snail where it transforms into a mother sporocyst which produces two generations of rediae which in turn develop into cercariae. These encyst on aquatic plants particularly water chestnuts and bamboo. Eating these uncooked water plants allows the metacercaise to enter the host and complete the cycle.

When large numbers of flukes are present they can obstruct the bowel intermittently and produce alternating constipation and diarrhea. Fluid may fill up the abdomen and nausea and vomiting are common. Extreme malnutrition can occur late. Treatment is by hexylresorcinol.

The lung fluke, Paragonimus westermani, is widely distributed in Africa, Asia, Far East, Mexico, and Central and South America.

The life cycle is complex and will be given in a simple form. The eggs produced by the adult in the lung ascend the bronchi and are spit out in sputum or swallowed and pass in the stool. The eggs reach fresh water and infect snails, then crayfish which when eaten raw transfers the parasite back to man. The immature larvae penetrate the intestine, pass through the peritoneal cavity, penetrate the diaphragm and enter the lung.

The parasites can involve many tissues but predominately the lung. The parasite encysts, enlarges and bursts resulting in coughing up a mixture of eggs, cyst and blood. Pneumonitis is a complication.

Diagnosis is made by identifying the ova in the sputum or in the stool. Treatment is the administration of Bithionol 30 to 50 mg/kg every other day in divided doses for 20 to 30 days. Prevention is again easy. Do not eat uncooked, freshwater crustaceans.

African Trypanosomiasis (Sleeping Sickness)

This disease is widespread throughout Africa particularly in Central Africa. It is caused by two organisms, T. Gambiense and T. Rhodesiene. The disease is transmitted by the bite of the tsetse fly and the disease is limited to the habitat of this fly. The parasite is a slender flagellate which in humans are found in the blood stream in large numbers. The fly aspirates the parasite from man. In the fly it undergoes a series of changes terminating in a metacylic trypanosoma residing in the salivary gland. They are reintroduced into man by the fly.

The pathological features are very similar to those of syphilis. Enlargement of the spleen is usual. In the latter phases of the disease the central nervous system becomes involved and appears as meningoencephalitis and meningomyelitis.

Clinical findings include inflammation at the site of the bite which may progress to an ulcer. Symptoms include fever and enlarged lymph nodes. Where there is nervous system involvement, cachexia, tremor of the tongue and hands, delusions, hysteria, manic behavior, lassitude and terminally, and coma may occur. Treatment, if the diagnosis can be made early, consists of suramin and pentamidine and is effective. With nervous system involvement treatment is ineffective and the mortality rate is very high.

Leishmaniasis

This parasitical disease is found in South America and the Mediterranean region. Kala-azar is typical and the most important variety. The parasite is L. Donovoni. As in most infestations three factors are necessary; a reservoir, a suitable vector and a susceptible population. In the Mediterranean area and South America the dog is the principal reservoir. Wild jackals and rodents are hosts in other areas. Flies of the phlebotomus order and other flies are also carriers. The fly acquires the parasite from the reservoir host. The parasite undergoes several changes in the insect and is introduced into man by the bite of the fly.

The disease begins with an ulcerated skin lesion which persists for four to six months at which point the parasite is disseminated to visceral areas via

the blood stream. The cells of the lymphatic system, spleen, liver, and bone marrow are parasitized by the organism and multiplies rapidly releasing thousands of new parasites.

Clinically, the primary skin lesion is usually not noticed. The visceral stage is characterized by chills, fever and vomiting. Recurrences of these symptoms indicates the beginning of the chronic phase. Emaciation, night sweats, liver and spleen enlargement are the chief findings.

Diagnosis is made by identifying the parasite in specimens from the spleen, bone marrow or lymph glands. Blood smears may also show the organism. Treatment consists of general supportive measures in nutrition and specific treatment with antimony compounds primarily. In the late stages the treatment is often unsuccessful and relapses are common.

Cutaneous Leishmaniasis (Oriental Sore)

This form of leishmaniasis is caused by Leishmania tropica. It is prevalent in Asia, the Mediterranean area of Europe and North Africa. There are two separate forms in which the epidemiology is separate. L. Tropica major has several mammalian hosts, gerbils most often, and is transmitted by sand flies. Man is not often involved but where there is close contact with gerbils the infection can be epidemic. The fly, Phlebotomus papatosi can transmit the parasite to man.

The other, L. Tropica minor, infects dogs and may be transmitted directly from dogs to man or man can be infected by the sand fly. Children are more often infected. In either form, at the site of inoculation a nodule forms which breaks down and forms an ulcer. These ulcers are from one to three centimeters in diameter and discharge a sticky exudate. The ulcers will heal spontaneously after several months or quickly with treatment.

The diagnosis, in cases of one or more ulcers in an endemic area, is indicative. The parasite can be demonstrated in the exudate from the ulcers. Treatment consists of the use of parenteral neostilbason. The medicine is given intravenously on alternate days for 10 to 12 doses and is usually curative. Patients develop an effective immunity.

Mucocutaneous Leishmaniasis (Espundia, American Leishmaniasis)

This form of leishmaniasis is common in Central and South America but is not seen in Chile or Argentina. The infecting parasite is Leishmania brazilinsis. The disease occurs in forested areas where forest is being cleared. People working in forests are also at risk. Wild rodents are the reservoir.

Clinically, a skin lesion similar to oriental sore can appear in an uncovered area of skin and can spread to mucus membranes of the nose and mouth. It may remain inactive for long periods. Locally, there may be extensive destruction.

The diagnosis can be made by documenting the parasite in ulcerated lesions. Unless the parasite is identified, other granulomatous disease such as syphilis, yaws and blastomycosis can be easily confused with it. Treatment is the same as for Kala-azar. Sodium antimony gluconate (Pentostan, Bayer 561, Solustiban) is one effective drug. The dose is 6 cc (.6 gram) given daily intravenously for 6 days to 30 days. There are other antimony compounds that can be used.

Toxoplasmosis

Toxoplasmosis is an infection by an intracellular parasite. Man and other animals are intermediate hosts. The primary hosts are various members of the feline or cat family.

In cats, the parasites reside in the intestinal tract. Eggs (oocytes) are passed in the stool. Man acquires the infection by eating foods contaminated with cat feces or by eating raw or undercooked meat of animals which are infected. The parasite in the form of tachyzoites (growing form) and the bradyzoites (encysted form) are the forms that are the ones that infect a new host. The infection may also be transmitted across the placenta to unborn fetuses.

Upon gaining entry the organisms enter the intestinal cells and multiply rapidly. They spread through the lymphatics to regional lymph nodes and enter into the blood stream. The liver and spleen are the most often involved organs. In these, the parasite multiplies rapidly and the blood stream becomes heavily involved.

The clinical disease is characterized in the congenital form by hydrocephalus, encephalitis and diffuse calcification in the brain. Adults may harbor the disease indefinitely without symptoms. Retinochoroiditis and generalized enlargement of lymph nodes occur along with a rash that is generalized except for the palms and soles of the feet. Pneumonitis resembling primary atypical pneumonia and myocarditis can happen. A mononucleosis-like syndrome of prolonged low grade fever, malaise with generalized lymph node enlargement is typical. Patients who are immunosuppressed for any reason may develop a fatal form of the infestation.

The diagnosis is difficult and may be impossible in a primitive area. There are laboratory tests based upon antibody formation that will be diagnostic if they are available. Treatment consists of simultaneous administration of sulfadiazine in full therapeutic dosage and pyrimethamine (Daraprim) 100 mg and an initial dose and 25 mg daily. This schedule should be maintained for five weeks. Prophylaxis is best established by the proper cooking of meats and by careful disposal of cat litter by others than pregnant women.

Pneumocystis Pneumonia

This disease is an opportunistic infestation. It affects infants and adults with immunosuppression from any number of causes. Today, AIDS is the most common disease predisposing to this infection although prematurity, debilitation from chronic disease and in patients receiving adrenocortical steroids or drugs given to suppress the immune system are occasionally etiological.

The clinical disease is in the form of an extensive, rapidly spreading form of pneumonia which may be fulminating and rapidly fatal or may be in the form of a slower developing pneumonia in a less acute process. Untreated, the disease is fatal in from 20 to 60% of patients. Treatment is the administration of pentamidine which in the US is available only from the Atlanta Disease Control Center. The disease is important for missionaries, particularly medical missionaries, in that these patients will present to the hospital or clinic with a pneumonia as the first symptom of AIDS. The patient with a severe pneumonia and advance debilitation should result in immediate AIDS testing.

Trichinosis

This common infestation is caused by a parasite, Trichinella spiralis which is a tissue inhabiting nematode. It is widespread in temperate and tropical climates. The parasite infects a number of animals but particularly hogs and rats. Man acquires the infection by eating raw or rare pork. The encysted larvae, which reside in the tissues of the hog, are liberated in the upper intestinal tract. They mature and eat there and the females penetrate and liberate new larvae which are carried by the bloodstream to the host musculature where they encyst.

The clinical disease is produced by the inflammatory and allergic response to the parasite. Twenty-four hours after ingestion nausea, vomiting, diarrhea, and abdominal pain become apparent. Fever develops and may rise as high as 105^{0} and persists for one to two weeks. Muscle pain (myositis) begins by the end of the first and into the second week and is very severe. Myocardial involvement may be present and periorbital edema is present.

Diagnosis can be difficult but is made easier when a history of ingestion of raw or rare pork is obtained. Demonstration of the parasite in muscle biopsy is final proof. There are tests based upon antibody production which can be of assistance. Treatment is unsatisfactory and symptomatic treatment for fever and pain is indicated. Thiabendazole may be of some effecting relief of symptoms.

For the missionary

As stated in regard to other infections, do not eat raw or rare pork.

Creeping Eruption (Larva Migrans)

Man is an accidental host in this disease. It is caused by Ancylostoma brazilense, the dog and cat tapeworm.

The tapeworm eggs are passed in the stool of the animal and contaminate warm moist soil. The eggs hatch into filiform larva which are capable of penetrating the skin. The larvae produce serpentine tracts as they burrow in the skin. This is accompanied by intense inflammatory and allergic response. The parasite may remain alive for several weeks or months but finally die terminating the problem for that particular parasite.

Treatment consists of application of a steroid cream may relieve itching. Thiabendazole 25 mg/kg twice daily for two days is the preferred treatment. The same drug, 500 mg/5 cc, applied topically covered with a layer of steroid cream will also give relief.

For the missionary

This disease can be prevented by having children dressed and wearing shoes in any areas frequented by dogs or cats. It a family has obtained a dog or cat as a pet the animal should be given worm medication or disposed of.

Dracunculiasis (Guinea worm)

This parasite is a tissue inhabiting nematode (worm) which has a complex life cycle.

It is endemic in many areas of tropical Africa, India, and the Arabic countries along the Red Sea, Iran and Afghanistan. It is most prevalent in west Africa in Mauritania, Senegal, Upper Volta, Ivory Coast, Togo, Benin, Ghana, Nigeria, and the Cameroons.

The female worm resides in the retroperitoneal tissues of the host (man) and at certain times migrates to the subcutaneous areas. A small papule appears as the worm nears the surface which becomes a blister. This ruptures allowing a part of the worm to protrude from the opening, this part being the uterus. The worm discharges hundreds of motile larvae. These larvae must reach water and be ingested by one of several crustaceans in order to survive. The parasite further develops in the crustacean into copepods. The crustacean is then eaten by the host where it is widely distributed and develops into maturity completing the cycle.

Man is infected by eating raw crustaceans or by drinking water containing the copepod larvae.

The clinical course is produced by the presence of the worm in or near the skin. As the worm approaches the skin erythema, generalized urticaria, severe itching, giddiness, and occasionally asthma occur.

Native people often pull the worm from the tissues but this is generally contraindicated as the effort may result in bacterial infection. Treatment by

Diethylcarbamazine (Hetrasan) in the same dosage used for filariasis is effective. A single injection of Trimelarsan (Mel W) is also effective. Mebendazole, 100 mg twice daily for 14 days is probably most effective.

The disease is best prevented in endemic areas by eliminating "step wells," treating the water with a solution of 1:1000 Quiklime and waiting 48 hours before drinking the water. This will sterilize the water of larvae for two weeks. Do not eat raw crustaceans in endemic areas.

For the missionary

Avoid wading or swimming in fresh water in endemic areas and drink only boiled, filtered water.

Relapsing Fever

This parasite, Borrelia recurrentis, occurs in Africa, Spain, the Near East, and Asia. The parasite is carried by lice and ticks. The tick resides in caves, native huts and rodent burrows. Rodents are apparently the reservoir. The parasite invades the tissues of the tick including the salivary glands where it is transferred to man by the tick bite. Most of the changes are found in the spleen and liver and less often the heart and central nervous system. A petechia rash, enlargement of the spleen and liver are to be found. Bronchitis is also common. Death which is not rare is usually from pneumonia.

The clinical picture consists of recurring periods of fever and toxemia of several days duration separated by a febrile period of seven to ten days. Diagnosis is made by finding the spirochetes in the peripheral blood during a febrile period. Treatment is tetracycline. Penicillin is less effective but chloramphenicol is very effective.

This is an incomplete account of parasitical disease in the Third World. Most of the total number have not been mentioned but those that have been are those that are most frequent and most important to the missionary.

Viral Diseases

Arbovirus Diseases

This is the largest group of viral diseases and is subdivided into:

Group A. This group is made up of about 12 diseases and includes the three major encephalitis diseases; Eastern Equine encephalitis, Venezuelan encephalitis and Western Equine encephalitis. These are all mosquito borne.

Group B. This group is composed of about 28 - 30 diseases which are either mosquito or tick borne. Major diseases in this group that are of importance are Dengue fever, West Nile disease and Yellow fever.

Bunyamwera Group. There are about 25 diseases in this group all of which are mosquito borne.

A fourth group represents minor subgroups and unclassified diseases. These are mosquito and tick borne.

Several individual infections will be discussed that may be important to missionary personnel.

From a clinical standpoint of symptoms, viral infections can be classified in three groups:

One group of infections are called arbovirus infections and produce a syndrome of fever, headache and generalized aching. These are not serious and are self-limited and do not produce disability.

A second group is characterized by fever, headache, malaise, arthralgia, and a rash. Leukopenia is a consistent finding. These are also self limited and while producing temporary disability require only symptomatic treatment.

A third group is the hemorrhagic fevers. Dengue fever, Yellow fever and several other varieties. One is Korean hemorrhagic fever which involved many American soldiers during the Korean War.

Yellow Fever

This disease probably originated in West Africa and spread to the Western Hemisphere and other areas. During the early and mid-portions of the last century there were repetitive epidemics in many Southern, Eastern, and Northern cities. One such epidemic was fatal to half the population of Philadelphia in 1813. In recent years it has been largely confined to Africa and is declining.

There is good evidence that the host vertebrates are a number of varieties of monkeys. The transmission agents are several types of mosquitos, the most important of which are Aedes Egypt, Aedes Africanus, Aedes Simpsoni and Aedes Furcefer-taylori.

Pathologically the virus affects the endothelium of the liver and myocardium. Lesions also appear in the adrenal glands, the conduction system of the heart and kidney. Hemorrhages may occur in the digestive system, spleen and lungs. In fatal cases death usually results from liver and kidney failure.

The clinical course of yellow fever is varied. There are many cases which are subclinical or mild cases which can result in immunity without the diagnosis being suspected.

There is a sudden onset with fever rising from 102° - 104° often associated with chills. Headache is constant and severe. Nausea and vomiting and abdominal pain and extremity pain all occur and can be severe. Anorexia and the vomiting often result in early dehydration. Jaundice appears early and deepens progressively. The pulse rate is high early but becomes weaker and slower each day. Anemia and leukopenia develop after several days.

Milder cases improve and recover from this point. However, in the more severe cases there is rapid deterioration with liver and kidney damage increasing. Abdominal pain becomes worse and vomitus containing blood is common as is diarrhea with blood being present in the stool. Jaundice becomes more intense and evidence of kidney damage is more apparent with diminution of urine output. Complete kidney shutdown, coma shock and evidence of heart failure characterizes the fatal cases. The central nervous system may be affected with symptoms of confusion, slurred speech, nystagmus, incoordination and tremor will be apparent. Convulsions and sudden death may intervene. The overall mortality is 5 to 10% but may be greater in some areas. The diagnosis in a mission area must be based on the clinical symptoms if laboratory facilities are not present. Severe viral hepatitis, leptospirosis, relapsing fever and Lassa fever produce similar clinical states and make the diagnosis uncertain.

For the missionary:

1. If one is going to an area where cases are reported one should be immunized even if it is no longer required.
2. Suspected cases should be isolated under mosquito netting to prevent further transmission by mosquitos.

Dengue Fever

This arbovirus infection is found throughout the tropics and sub-tropics. It is transmitted by various Aedes mosquitos. There are at least four sub-types of the disease. It belongs to the group of hemorrhagic fevers.

There is an incubation period of 5 to 8 days followed by an abrupt onset of chills and fever, headache, orbital pain, severe backache, and aching of the extremities. The temperature rapidly rises to levels around 104° and the heart rate becomes slow and weak. Generalized enlargement of lymph nodes and

splenic engagement occur. A rash first appears on the face then patchily spreads over the entire body.

All symptoms persist for 48 to 96 hours followed by rapid defervescence and profuse sweating. The patient feels better for about 24 hours then a second temperature rise occurs but not as high. Fever, rash and headaches have been termed the Dengue triad. Generally the mortality rate is zero but disability and convalescence are prolonged and may span several weeks. Malaise and weakness will persist even longer.

Leukopenia is universal and the white count ranges from 2000 to 4000 with only 20 to 35 granulocyte. The disease may easily be confused with yellow fever. Laboratory diagnosis by serological studies is accurate if the facilities are available. Treatment is symptomatic but bed rest is required. The patient should be isolated under mosquito netting to prevent further transmission.

There is a Dengue hemorrhagic shock syndrome which occurs in Southeast Asia and involves children under 10 exclusively. This variety is similar to that just described except on days 2 to 6 a shock-like state develops with hypotension and cyanosis. There are hemorrhagic manifestations of purpura, petechia, vomiting blood, blood in the stool, nosebleed, and sometimes subarachnoid hemorrhage. Liver enlargement, bronchopneumonia and pleural effusion. Myocarditis can occur.

The patients show reduction of platelet and evidence of blood loss. These children require intravenous fluids, platelet transfusions and red cell replacement if possible.

There is a group of rodent related, viral hemorrhagic fevers which are important. Argentinean and Bolivian hemorrhagic fever are two of these. Rodents serve as the reservoir and the disease is widely disseminated in the rodent population. It is easily transmitted to man and the mortality rate is 10 to 30%.

Clinically, after an incubation period of one to two weeks there is a gradual onset of fever and muscle pain. This is followed by headache and conjunctivitis. Hemorrhagic events begin on the 5th day and include bleeding from the gums and petechia which are generalized, nosebleed, coughing up blood and vomiting of blood, and tarry stools are indicative of the serious nature of the disease. Blood loss may be serious. Tremor involving the extremities is also a feature.

Diagnosis is clinical although laboratory serological diagnosis is possible but dangerous to laboratory workers. Treatment is supportive and includes parenteral fluids and transfusion. Passive immunotherapy is effective if convalescent plasma is given early. Prevention is generally infective but rodent control offers the best hope. Avoidance of epidemic areas by expatriates is advised.

Viral Hepatitis

Hepatitis is one of the most important viral diseases and one which is extremely prevalent in the Third World where missions exist. It is, other than malaria, the most common serious illness acquired by missionaries. It is also the most common cause of short term and long term disability of missionaries.

It is an over simplification to state that there are two types: Type A (infectious hepatitis) and Type B (serum hepatitis). There are a number of sub-types but this classification is of no interest to missionaries. Type A is worldwide in distribution and becomes epidemic at times. It is transmitted by fecal contamination of food and water. Contamination of water is most important but any bodily fluids can transmit the virus. In tropical, underdeveloped areas, Hepatitis A will be the most common with fecally contaminated food and water being the source of infection. An asymptomatic food handler can be a source of infection.

Clinical characteristics. There is a moderately long incubation period from two to seven weeks followed by an insidious onset of malaise, fever and anorexia. Jaundice after considerable damage has been incurred by the liver. Symptoms are milder in children and the first symptom may be jaundice. In dark skinned and black people, jaundice may only be seen in the conjunctivae. The liver and spleen will usually become enlarged and slightly tender. Generalized enlargement of lymph nodes may develop and if this does occur then mononucleosis must also be considered.

Type B is generally transmitted by infusing infected blood products and by sharing needles and syringes in drug users or in hospitals where there are poorly trained nurses and also untrained native practitioners. Drug abusers are not as common as they are in the Western world but are always present. Their custom of sharing needles and syringes is a common source of infection. Outbreaks have also occurred from eating raw shellfish and in handling of animal tissues.

Accurate diagnosis is dependent upon laboratory testing which will show abnormal liver function. The level of serum bilirubin reflects the level of jaundice. The common tests are cephalin flocculation, thymol turbidity, SGOT, SGPT, and bromsulphalein retention. There

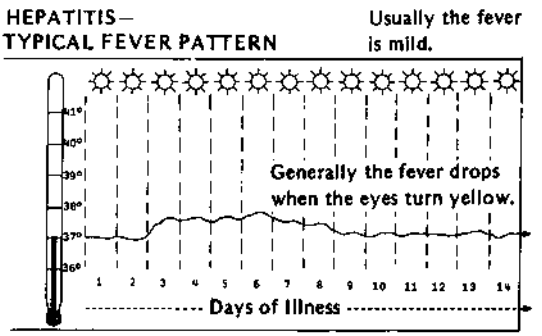


Figure 10-5. From: *Where There Is No Doctor, A Village Health Care Handbook*, page 26.

are newer and more sophisticated tests for identifying the type of such viruses. These will not be available in the mission field. The white cell count is lowered and the sedimentation rate is accelerated. The fever curve is that of a sustained low grade fever. There is no effective treatment other than supportive measures which include bed rest, low fat diet and increased intake of the B vitamins. The severe anorexia may result in inadequate food and water intake and this must be watched carefully.

An important fact is that recovery requires many weeks and the disappearance of jaundice is not proof that recovery has occurred. Activity must be severely curtailed until the temperature is normal and the sedimentation rate returns to normal. The enzyme tests SGOT and SGPT, if available, should return to normal. Any attempt at returning to normal activity too early will only prolong recovery and may precipitate relapse and increase the likelihood of progressing to a chronic hepatitis.

Complications. The disease may assume a very severe form with destruction of most or all of the liver. This can result in permanent liver impairment and in some cases may prove fatal. Deepening jaundice, stupor and coma indicate this type of disease. Cirrhosis is not common in the United States but in the author's experience in Nigeria it has been a common and disabling complication. Ascites (fluid accumulation in the peritoneal cavity), edema of the lower extremities, emaciation and bleeding from varicose veins in the esophagus are all the results of cirrhosis. Hepatoma, a malignant liver carcinoma, is also a fatal complication.

For the missionary:

1. Hepatitis A vaccine, if available, should be taken. If so, the immune globulin will not be necessary.
2. Drink only boiled and filtered water.
3. Eliminate insects such as flies that can carry the disease.
4. See that food handlers wash their hands often and use good methods of food preparation.
5. Take Hepatitis B vaccine prior to travel.
6. Take immune globulin 4-5 ml i.m. prior to travel and at four month intervals.
7. If a family member contracts hepatitis, all other members should take immune globulin.

Rabies

This viral disease is discussed here because it remains a serious threat throughout the world. Americans who are accustomed to having domestic pets immunized do not realize that in the Third World virtually no animals are immunized. Rabies is a catastrophic form of encephalitis which is generally fatal in untreated victims.

The virus infects and is transmitted by dogs, cats, foxes, wolves, jackals, bats, coyotes, skunks, stoats, mongooses, weasels, and squirrels. The virus is found in the saliva of infected animals and is most often introduced by entering a bite wound. Once in the body, the virus travels along peripheral nerves to reach the central nervous system. A diffuse encephalitis results which is most marked in the brain stem and cervical spinal cord. The virus can be found throughout the body once it is established.

The clinical course is initiated by an animal bite. Thirty-five to 60% of individuals bitten by a rabid animal will become infected. There is a variable incubation period from two weeks to two years but is usually one to three months. The incubation is shorter if the bite is on the face, neck or hands or if the bite is severe.

There are two clinical types. The first is termed the excited type and is characterized by an early rise in temperature, development of symptoms of anxiety, melancholy, irritability, and varied neurological reactions. Insomnia is a constant symptom. Headache and paresthesia of the trunk, face and extremities begin as the disease progresses. Periods of agitation with abnormal behavior appear. The patient may be unable to close the eyes and mouth and becomes unable to swallow or cough. Spasms of the larynx and the patient becomes afraid to attempt eating or drinking. Respiratory spasms can be initiated by minimal stimuli such as bright light. Convulsions begin and increase in frequency terminating in death usually within a period of ten days from onset.

The other type is termed the paralytic type. The symptoms are less marked initially. The patient becomes depressed and apathetic with malaise and fever. This is followed by weakness, ataxia and paralysis beginning in the legs. Findings of encephalitis appear and coma develops later. Death may be delayed for as long as a month but is inevitable.

The diagnosis may be difficult to differentiate from other forms of encephalitis except for the history of an animal bite which may have been forgotten or discounted. A viral laboratory can cover and identify the virus but this luxury will not be available to the missionary. There is an effective vaccine which should be taken by all personnel prior to travel.

Post exposure management:

1. Wash the wound with soap and water and alcohol or tincture of iodine.
2. In the case of an un-immunized individual, if the bite is on the face, neck or hands hyperimmune human serum should be given immediately. Rabies vaccine can be given if it is certain that the animal is rabid. It should be given on days 1, 3, 7, 14, 30 and 90.
3. If possible the animal should be caught and confined for a six month period. If a veterinarian is available, the animal should be examined. Authorities

recommend that if the animal dies it should be packed in ice and shipped to a facility capable of studying this problem. This is not likely to be a practical course in a mission area.

For the missionary:

1. Take rabies vaccine before travel.
2. Do not keep native animals as household pets.
3. In the event of a bite by an animal suspected of being rabid, seek medical care immediately.

Measles

This common viral disease is still present in the United States but is diminishing. Immunization is effective if taken. Unfortunately there are still un-immunized children in the United States because of parental ignorance and apathy. There is still a common belief that measles is just a childhood disease which the parent does not need to worry about. The disease is a deadly scourge to the children of the underdeveloped countries. The disease is endemic in most tropical countries and epidemics are not uncommon. Much effort has been expended in recent years to immunize children particularly in Africa but still there are many thousands, perhaps a majority, which have not been immunized. In West Africa the disease frequency is highest in the dry season. The mortality rate in this area is at least 10%. In some epidemics it has reached as high as 45%.

Contrary to the popular concept that measles is only a febrile illness with a rash, it is a major systemic disease which involves the respiratory system and the gastrointestinal tract. The myocardium (heart muscle) may become involved and encephalitis can be a serious complication. The immediate mortality is most often due either to the viral pneumonia or to a complicating bacterial pneumonia.

The most major result is that the post measles period is prolonged and characterized by immune deficiency, anorexia and malabsorption syndrome all of which predisposes to malnutrition and infections such as diarrhea and bacterial pneumonia. The malnutrition often becomes severe to the point that kwashiorkor or marasmus may develop. Many of these children already were anemic and malnourished prior to measles and also had hookworm and malaria. A critical situation often develops from which it is difficult to rescue these children.

For the missionary:

1. Be certain that all children and those with no history of immunization or measles are immunized prior to travel.
2. Encourage all native people to seek immunization.
3. Native children who contract measles should be encouraged to seek medical help.

Lassa Fever

Lassa fever belongs to a family of viruses termed arena-viruses. It occurs in West Africa in Sierra Leone, Nigeria, Guinea, and Liberia. The host reservoir is the rodent population which inhabits houses and the nearby bush. The mode of transmission from rodent to man is uncertain. Person to person transmission is a major problem.

The disease tends to occur in sudden small epidemics. It is probable that there are many mild or subclinical infections which may outnumber the severe illnesses by a factor of 20.

The disease was first identified in a mission hospital at Lassa near Jos in Nigeria. A single case resulted in three deaths of hospital personnel as well as the patient. There were secondary transmissions to hospital workers in Jos and the sera and other biological material which were sent to Great Britain and in the United States resulted in infection of several laboratory workers. The danger to nurses and doctors is illustrated in a 1989 outbreak in Enugu, Nigeria where three doctors died in 11 days. An epidemic in Aba, Nigeria in 1994 resulted in 22 deaths.

The clinical course is marked by sudden onset of fever, sore throat, proteinuria, peripheral edema, gastrointestinal and genitourinary bleeding, and convulsions. Death occurs in 16 to 50% of the initial infections. With each secondary transmission the mortality rate decreases. An epidemiological study in Aba suggested that shared needles and syringes probably accounted for many of the secondary infections. Many of these patients have been treated as malaria or unknown infections and have been given antimalarial drugs and antibiotics.

The hemorrhagic findings should alert medical personnel. The taking and handling of blood and serum and other patient emission is extremely dangerous. Laboratory studies can be of only negative value and should not be ordered. Early diagnosis by reverse transcription test (PCR) is possible with an adequate laboratory.

For the missionary:

1. Eradicate rats as far as possible from housing and the immediate area.
2. Do not handle dead rats.
3. In epidemics, total isolation of patients with the use of gowns, gloves and masks is necessary.
4. If there is an epidemic in the area, stay away from any known area where patients are.
5. There is no vaccine, however the use of convalescent serum has reduced the death rate strikingly.

Marburg and Ebola Hemorrhagic Fever

The Marburg virus is a single filovirus which probably resides in monkeys as the reservoir. Human cases have occurred from infected monkeys and it is transmissible person to person. Other suspected reservoirs include spiders, ticks and bats. There have been less than 30 human cases reported but with a mortality rate of 25%.

There are two types of the Ebola virus which are closely related filoviruses. The Sudan and Zaire subtype of the Ebola virus has been responsible for several explosive epidemics with mortality rates as high as 88%. In other epidemics the death rate has been from 50 to 65%. The source of the infection has not been determined in any of these outbreaks.

Transmission may be by droplet inhalation, via a wound and unsterile needles and syringes. The medical staff of a hospital are most at risk. The disease may be transmitted through as many as five generations of patients.

The clinical disease has an incubation period of 5 to 10 days. There is a sudden onset fever with muscle pain, headache, nausea and vomiting, abdominal pain, diarrhea, chest pain, cough, and sore throat. Other symptoms include generalized enlargement of lymph nodes, jaundice and symptoms of pancreatitis.

There will be early development of symptoms referable to the central nervous system including delirium, stupor and coma. Hemorrhagic manifestations begin as the disease worsens in the form of petechia, hemorrhage from needle punctures and hemorrhage from mucus membranes. By the 5th day a rash on the trunk is common. In the second week the patient will either improve rapidly or die in shock with evidence of disseminated intravascular coagulation. Those that survive will recover slowly with evidence of hepatitis, spinal cord injury and testicular involvement.

Diagnosis in the context of a mission station will be problematic but can be suspected if there are multiple cases. Yellow fever and Lassa fever will have similar appearance. There are no preventive measures and treatment is supportive only.

For the missionary

1. If an explosive epidemic should develop close proximity to you or involve mission personnel, it is best to leave the area temporarily.
2. Do not handle or make pets of monkeys.

Smallpox

Smallpox is a historic disease which has decimated mankind throughout his existence. A global campaign by the World Health Organization beginning in 1967 has been successful in eradicating the

disease completely. The last known case was seen in West Africa in 1977. The author saw one of the last cases in 1972 in Nigeria. Immunization is no longer required for travel.

The viral encephalitides will not be discussed in detail. Viral encephalitis can be suspected in a febrile illness in which the symptoms are all related to the central nervous system. If there is a febrile illness in which neurological symptoms appear, medical help should be obtained.

A final comment

There are numerous arbovirus infections other than those which have been described. Almost all are, like those discussed, transmitted by mosquitos or ticks. Ebola fever and Lassa fever are exceptions. This fact should serve to emphasize the importance of the prevention of mosquito bites by every means possible.

Bacterial Diseases

There are many bacterial diseases that have worldwide distribution and are similar clinically. Those that will be discussed are those that pose real problems in the Third World and are a threat to missionaries.

Diarrheal Diseases

These are serious diseases in tropical areas and are dependent on fecal contamination of water and food. In many countries, particularly in Africa, there are essentially no sewage facilities not even primitive latrines. The waterborne infections are most frequent in the dry season which is in the winter months in Africa. The rivers and streams have greatly reduced flow and the contamination which is constant results in a much higher concentration of bacteria. Safe water supplies are rarely available. The lack of refrigeration, contaminated soil and the washing of vegetables with contaminated water all contribute to the problem. These illnesses in native populations cause more disability and death than any other disease with the possible exception of malaria. Diarrhea is the most common cause of death in Africa in children under five.

Bacillary Dysentery (Shigellosis)

This form of diarrhea is caused by several organisms of the Shigella family. It is a disease peculiar to man and as mentioned is transmitted primarily by fecal contamination of water. Infected food handlers and flies are also contributory.

Pathologically there is an acute inflammation of the lining of the colon initially which progresses to acute ulceration with large amounts of pus being formed. Bleeding from the ulcerated areas is common and perforation of the bowel is an uncommon complication.

Clinically there is an incubation period of one to seven days after which there is a sudden onset of high fever and rapid heart rate. Diarrhea may ensue immediately but is more likely to be delayed for 12 to 24 hours. The diarrhea is profuse with severe cramping. The stool contains pus and mucus often with blood staining. Severe or even fatal dehydration may occur rapidly, particularly in small children. Prostration is extreme and the patient appears very toxic. Diagnosis can be suspected from the clinical course and from the stool appearance. Laboratory confirmation depends on finding the bacteria on culture which is not available to most missionaries.

Treatment is best based on the clinical symptoms and findings of toxicity, fever, dehydration, and the character of the stool.

Therapy consists of rapid rehydration with a balanced salt solution orally or intravenously and antibiotic therapy. Ampicillin 250 to 500 mg four times daily or tetracycline 2 grams as a single dose are effective. Symptomatic therapy with Lomotil or paregoric after four to six hours may relieve cramping and slow diarrhea. Pepto-Bismol may also afford relief.

Salmonellosis

This is a group of bacteria which cause serious illness and as before from fecal contamination of food or water. There are several types but only those causing gastrointestinal disease will be discussed. (Figure 10-6)

Typhoid and Paratyphoid Fever

Typhoid fever is caused by Salmonella Typhi and is a human disease only. Transmission is as mentioned. Human carriers which are asymptomatic are also involved in transmission particularly if they are food handlers.

The onset of the illness is characteristically a step wise onset of fever over a two to three day period. The elevation may reach 103° to 106° degrees. Headache and abdominal pain are present and abdominal tenderness may be present. Chills may also occur. A rash of reddened raised areas (rose spots) is typical. Early, gastrointestinal symptoms may be absent but by the second week diarrhea, nausea and vomiting will be the predominate picture. Bacterial shock may also occur.

Diagnosis can be made by finding the bacillus in the stool. Laboratory testing (Widdal reaction) is diagnostic. There are other serological tests that are useful but they are of no interest to missionaries in the context of this discussion. In the Third World, laboratories capable of performing these tests and bacterial cultures that are reliable, are generally unavailable. Therefore, a presumptive diagnosis based on the clinical findings will be necessary.

Treatment with chloramphenicol is curative. An initial dose of 50 mg/kg of body weight is given followed by the same amount daily divided into three, eight hour doses for 24 hours. Then half that amount is given for 10 days. (Figure 10-7)

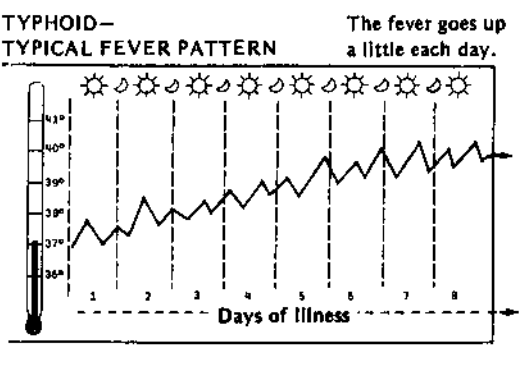
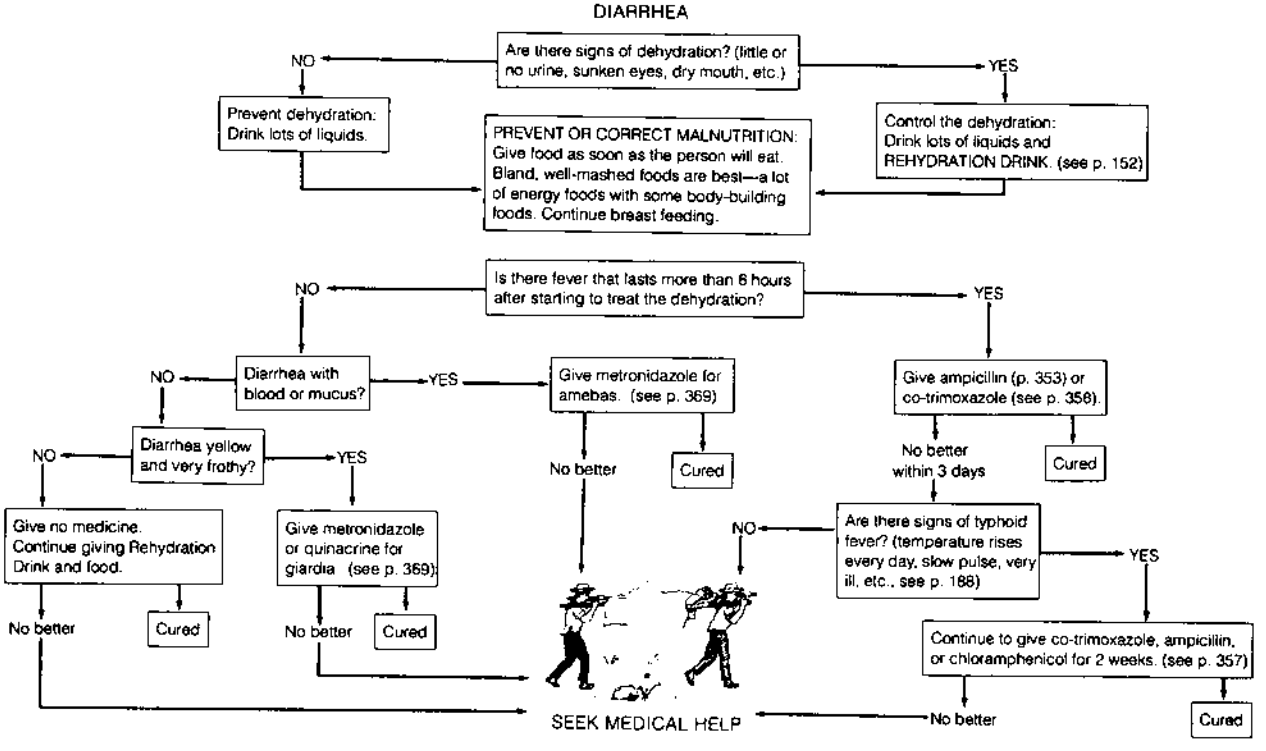


Figure 10-7. From: *Where There Is No Doctor, A Village Health Care Handbook*, page 26.

THE CARE OF A PERSON WITH ACUTE DIARRHEA



Prevention is possible. Typhoid immunization must be one of the immunizations administered prior to travel with repetition at three year intervals. Secondly, food and water precautions as described above are also effective.

Paratyphoid infections cannot be distinguished from typhoid except in the laboratory and is subject to the same treatment.

Cholera

This serious and often fatal disease can occur in temperate areas as well as in tropical areas. It predominates in Asia and Africa.

It is caused by Vibrio Cholerae and is dependent upon fecal contamination of water. In major epidemics there may be direct contamination of food by feces. It occurs in major epidemics in overpopulated areas where there are no public health measures used for water purification and no sewage management. Where there is civil strife with large numbers of refugees crowded together cholera is likely to occur. Isolated cases and mini-epidemics of less than 10 cases are now more likely. In Nigeria, the author saw two to three patients each month, often from the same village.

The clinical course is marked by a sudden onset of painless diarrhea. The volume of stool varies but is voluminous and may exceed 1500cc/hour. The character of the stool is that of water that rice has been boiled in. Muscle cramping, weakness and prostration occur as dehydration worsens. It is not unusual for the patient to be in hypovolemic shock within three hours and to die from dehydration from six to twenty-four hours. Untreated, the mortality rate is 50-60%.

These patients have usually been ill only two or three hours when they present a picture of collapse, cyanosis, with weak or absent pulse. Blood pressure will be at shock levels i.e. less than 70mm systolic. The heart rate is rapid and the state of consciousness varies from stupor to coma. (Figure 10-8)

Laboratory findings, if they are available, will be those of hemoconcentration and dehydration. The bacteria can be identified in smears or culture.

The diagnosis must be clinical for there is no time for laboratory procedures even if available. The diagnosis is simple based on the character and volume of the stool and the picture of rapidly worsening dehydration.

The treatment consists primarily of efforts at rapid rehydration. Missionary personnel that are not medically trained must depend on oral rehydration with the solution often termed "cholera mix" the formula for which is found in the appendix of drug and medicines. If the ability is present and intravenous fluids are available, Hartman's solution or normal saline should be given as rapidly as possible. The initial requirement in adults may exceed three to four liters the first hour. Even with good medical

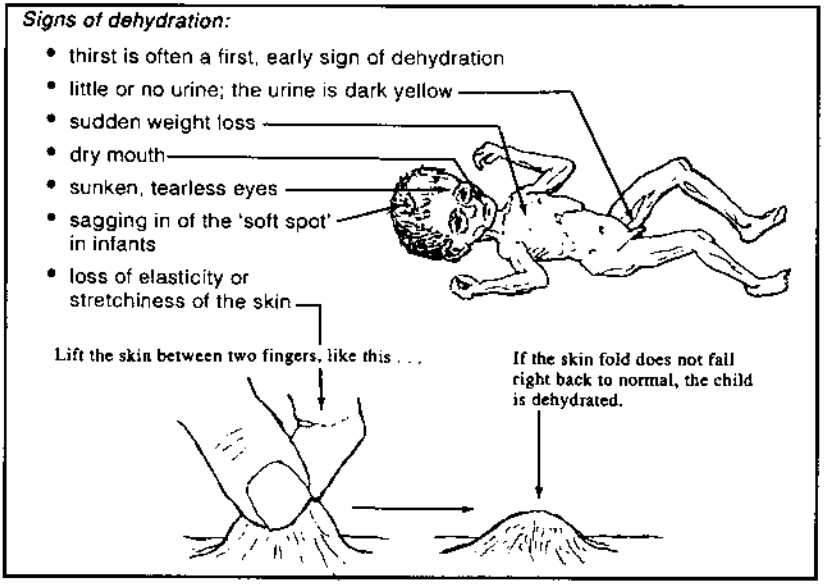


Figure 10-8. From: *Where There Is No Doctor, A Village Health Care Handbook*, page 157.

care there is a significant mortality rate. Children are more at risk and must be treated more aggressively.

The answer to cholera is prevention. There is no person to person transmission and there is no risk in caring for them. The family of the victim should be advised to boil water and try to get their neighbors to do the same.

For the missionary

There is little risk for missionaries if they observe the following rules for prevention of water and food borne diseases:

1. Boil and filter all water for drinking.
2. Carry sufficient water with you during travel.
3. Bottled or canned soft drinks are safe. If they have been submerged in water for cooling, rinse the container and wipe it off carefully.
4. Do not eat salads in restaurants.
5. Carefully cleanse any vegetables or salad greens that are to be eaten uncooked.
6. Meats should be cooked well done.
7. Avoid any uncooked foods outside your home.
8. Do not eat peeled fruits such as oranges.
9. Do not drink or eat any dairy products that have not been pasteurized.
10. Use boiled water when brushing teeth.

Pneumonia (Pneumonitis)

Pneumonitis may be either viral or bacterial. Bacterial pneumonitis may be due to a number of organisms such as pneumococcus, staphyloccis, streptococcal and influenzae pneumonia. Organisms which are classified as gram negative bacteria also cause serious forms of pneumonia. The organisms include pseudomonas, proteus, pasturella, and others. These are more serious and less likely to respond to antibiotics. (Figure 10-9)

Pneumonitis is often a complication of an upper respiratory infection such as a cold or of a more major viral infection such as influenza. Pneumonitis is an infection within the lung and as such has the potential of being very serious.

The clinical picture of pneumonia may vary depending on the organism. Generally, there is an onset of fever from 101^0 - 104^0, which may be associated with chills. There is usually a very rapid (110-130) heart rate and respiratory rate (20-25 per min). If the disease is bilateral or involves an entire lobe or lung, cyanosis (blueness of the skin and lips) may be present. In some, there is involvement of the pleura which will be signified by sharp pain on either side synchronous with respiration or coughing.

The clinical course may be fulminating on occasion or may take a less severe course.

The missionary not having the means of diagnosis, should start taking antibiotics in high doses and seek medical help as rapidly as possible.

Symptoms may be helped by acetaminophen or aspirin and a cough syrup such as Robitussin DM. Any temperature over 103^0 - 104^0 should be considered an emergency for the patient and medical help should be obtained.

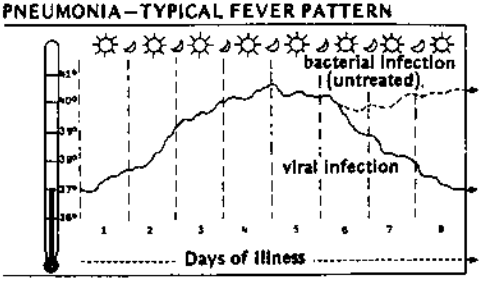


Figure 10-9. From: *Where There Is No Doctor, A Village Health Care Handbook*, page 27.

Brucellosis (Undulant Fever, Mediterranean Fever, Malta Fever)

Brucellosis is a worldwide disease which has become uncommon in Western countries due to diagnosis and control of dairy herds. There are three bacteria causative agents; Br. Abortus, Br. Melitensis, and Br. Suis. Each are naturally infective for cattle, dogs, goats, sheep, and hogs. The infected animals generally show little evidence of disease.

The disease can be transmitted to man by direct or indirect contact with

diseased animals. The milk of infected animals is a major source of infection and the tissues of the animals are also infective as are all normal discharges.

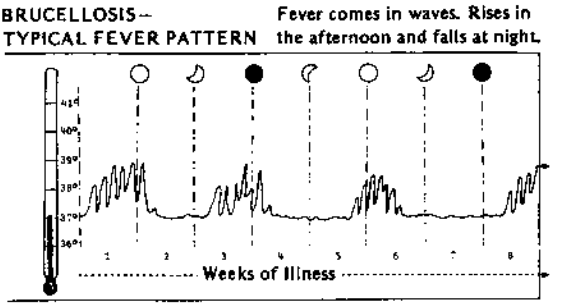


Figure 10-10. From: *Where There Is No Doctor, A Village Health Care Handbook*, page 26.

The entry into man is through skin abrasions, conjunctivae and by ingestion of milk, dairy products and meat.

Clinically, the disease has an incubation of one to three weeks. The severity varies with the organism involved. Br. Abortus produces a more serious illness. There can be an acute onset with chills, fever, headache, and anorexia. All of these symptoms are variable. There also may be an insidious onset with low grade fever, fatigue, generalized pains, and occasionally mental depression. (Figure 10-10)

The physical findings are nonspecific and include lymphadenopathy, splenic enlargement, and occasionally liver enlargement. Complications include neuropsychiatric illness, spondylitis of the spine, blood stream infection, testicular involvement, and inflammation of the eyes.

From the foregoing, it is apparent that the symptoms and findings can mimic many other diseases particularly viral infections. Diagnosis will not be possible in the mission field. Serological studies are accurate and culture of the organism from the blood is diagnostic.

For the missionary

Any acute febrile illness that lasts from weeks to months is suspect and should require travel to a modern hospital. Treatment with accurate diagnosis consists of tetracycline 500 mg four times daily for three weeks. Some patients are more seriously ill and in these Streptomycin 500 mg intramuscularly twice daily for two weeks should be given. This can be associated with prednisone 20 mg daily for five days will also be of help.

Prevention is the most important factor and involves not handling animals or animal tissues. Eating or drinking pasteurized milk and other dairy products is the most important measure that can be taken.

Tetanus (Lock jaw)

The cause of this infection is clostridium tetani. Its distribution is worldwide. It is dependent on fecal contamination of soil or water. This disease has ceased to be a significant problem in the western world because the

immunization rate is almost 100%. However, in the underdeveloped world, it remains a serious and frequently fatal disease.

There are two forms of the disease that the missionary may encounter. Neonatal tetanus results when there is contamination of the umbilical cord by the use of unclean hands or unsterile instruments. The onset is rapid and there is generalized tetanic spasms of the body musculature by the fourth day of life. The parent often notices that the infant is unable to nurse. If the baby can receive antitoxin and antibiotics by the fifth day, recovery is possible in 50-75% of patients. After the sixth day, the mortality rate is near 100%.

The adult form begins with contamination of a wound, often a trivial wound. (Figure 10-11) There is a variable period before the disease appears depending on the distance of the wound from the central nervous system. A wound may require 30 to 50 days before symptoms appear. A wound about the head and neck may result in tetanus in 7-10 days.

There is little about the wound to suggest tetanus infection. Recognition of the disease is dependent on the occurrence of massive repeated spasms of all body musculature. These may be continuous or intermittent. During the tetanic spasms, breathing is impaired and cyanosis is common. Swallowing is largely impossible.

Prevention. This disease can be eradicated by immunization. Treatment consists of human antitoxin and antibiotics. In the Third World, the mortality rate is almost 100%. Support measures such as respiratory support and control of spasms is not possible in that environment.

For the missionary

1. Update tetanus immunization before travel and at 5 year intervals
2. Careful care of minor wounds.
3. Encourage native people to obtain immunization.

Tuberculosis

This disease is an ever-present plague of mankind. It is a chronic disease caused by Mycobacterium tuberculosis. There are several variant organisms usually termed atypical that pose problems for the physician, however, for this discussion they will not be discussed. One variant, M. Avian, has assumed a new and often lethal role in AIDS patients. Another form M. Bovis infects cattle and man and is transmitted in milk.

The illness is acquired almost altogether by personal contact by inhaling respiratory secretions produced by coughing or otherwise coming in contact with infected sputum.

The initial infection is called primary tuberculosis which develops in the lung and spreads to regional lymph nodes. Most often the lesion becomes inactive and calcifies. In some cases, after a period of about six weeks, the patient develops an allergic response and the disease progresses as secondary

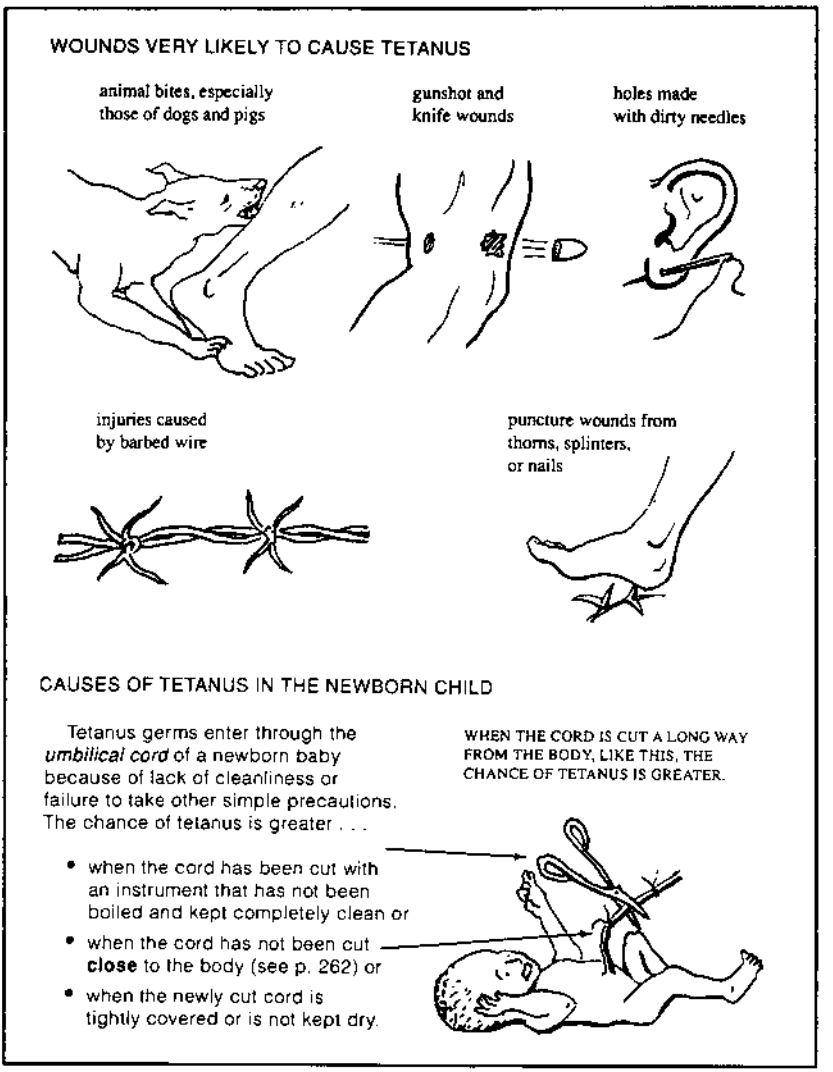


Figure 10-11. From: *Where There Is No Doctor, A Village Health Care Handbook*, page 182.

tuberculosis. This is the form seen in older children and adults. The primary disease in infants can develop into a tuberculous pneumonia and the involved lymph nodes can enlarge to the point that the bronchi can be obstructed.

The secondary or immune form can assume a nodular confluent lesion in the lung. This can involve one or more segments of the lung or even an entire lobe or lung. Often the lesion necrose and a cavity is formed. Cavities may be multiple or even bilateral. The cavitary form is the most contagious variety because the patient is continually coughing up the infected contents of the cavity.

Symptoms do not relate to the extent or type of disease. Often the symptoms are minimal and consist of a mild cough, low grade fever and weight loss. The cough can be very productive. The disease can erode into a pulmonary vessel and result in the coughing up of blood. This is usually minimal but may be massive or even fatal. An acute spread to other areas of the lung can occur at any time usually when a cavity drains suddenly into a bronchus and the contents are aspirated into the opposite lung. This may be a fatal complication. Involvement of a pulmonary vein can also disseminate bacteria throughout the body producing a generalized miliary disease which is a very serious complication. The disease may become chronic and show little change over months to years but slowly getting worse. There are several complications which produce major problems for the patient and the doctor: hemorrhage, as mentioned, is a frequent and sometimes a major complication. The disease may spread to bones and joints and be very destructive. The vertebrae, if involved, will collapse and produce severe deformity and may injure the spinal cord (Pott's disease). The infection can spread to the abdomen and produce tuberculous peritonitis which is serious and very difficult to diagnose. The infection can extend into the pleural space around the lung producing a collection of fluid or pus. This may require surgical management. In small children the infection can spread to the central nervous system and produce meningitis. This is a critical illness requiring very aggressive medical management.

The diagnosis of tuberculosis is not difficult once it is suspected. There are many patients with such minimal symptoms and more with no symptoms that do not seek medical help. This is the reason for mass surveys of large population groups by either skin testing or x-ray. In Third World countries this has proven to be difficult to accomplish. Skin testing is useful in a population where the disease is uncommon. A positive skin test means only that the patient has had an exposure to the disease at some time and does not necessarily indicate active disease. A positive skin test in children under twelve is significant. In a patient with far advanced disease or one with miliary disease the skin test may be negative. One is left with trying to make a diagnosis

in those with clinical symptoms and those who are in critical positions such as hospital workers, food handlers and house servants. Presumptive diagnosis can be made by the chest x-ray if available. The diagnosis is established by finding tubercle bacilli in the sputum or gastric secretions. The older methods are not very efficient but good laboratories have new techniques which are very reliable but which are not usually available.

There are now a number of drugs available for treatment which, when used correctly, are effective. They are divided into first line drugs which include isoniazid, rifampin, ethambutol, and streptomycin. The second line drugs include ethionamide, cycloserine, pyrazinamide, and para-aminosalicylic acid. These are used in retreatment and when the bacteria are not sensitive to first line drugs. Streptomycin and other drugs viomycin, capreomycin and kanamycin are available when injectable drugs are required.

The basis for therapy is isoniazid given with a second drug either ethambutol or streptomycin. Rifampin is also a choice. Two drugs are used to prevent the bacilli from developing resistance. Triple drug therapy may be indicated in critical illness. Any regimen for treatment must be prolonged for at least two years. In Third World populations where supervision is difficult, or impossible, intermittent therapy may be helpful but not as reliable and more likely to result in drug resistance.

Another approach in underdeveloped countries is the use of BCG which is a vaccine made of attenuated live organisms that produce a degree of immunity particularly in children. This has to be a mass program to be effective but studies have shown a diminished incidence where it has been used.

For the missionary

Tuberculosis is very common in the mission field and is usually undiagnosed, therefore, a patient with active disease but with few symptoms may be employed as a houseboy, cook, or clerical employee and can be a threat to mission personnel. It is the opinion of the author that household employees or other mission workers should have a skin test followed by a chest x-ray even if this involves travel and expense. Certainly, any employee with symptoms of cough, fever and weight loss should be examined.

Rat-bite Fever

There are two separate rat-bite fevers.

Spirillum manus (Soduka)

The causative agent is a gram negative, spiral organism which infects rats worldwide. The disease in rodents is not apparent. Animals which feed on rats can become infected and their bites and scratches can transmit the infection.

The infection produces swelling and necrosis at the site of inoculation. Swelling of regional lymph nodes follows. The disease tends to relapse and reactivate. The liver, kidney and spleen can become involved with significant damage resulting. A form of meningeal infection can also occur.

Clinically, after an incubation period of one to four weeks the site of the bite or scratch becomes swollen and painful with ulceration developing. The victim becomes febrile and may have an elevation up to 104^0 which falls by crisis after several days. The patient may remain asymptomatic for three to seven days and then symptoms are renewed. This may occur several times.

Untreated, the visceral disease can become severe producing a mortality rate of 6 to 7%.

Diagnosis is suggested by the typical symptoms following a rat or other animal bite or scratch. Differentiating from relapsing fever may be necessary. The diagnosis can be proven by finding the organism or dark-field or Giemsa stained material from the infected bite.

Streptobacillus moniliformis (Haverhill Fever, erythema arthriticum epdermicum)

This variety is also widespread. Approximately 50% of wild and laboratory animals are infected and other animals may become infected. The disease is spread by bites and by saliva and milk-borne epidemics can occur. The disease can also be acquired by infected turkeys.

Pathologically there is usually no lesion at the site of injury but systemic involvement of the lung and heart do happen. Clinically, following a short interval, there is a viral-like illness with chills and fever, headache and muscular pain followed by development of a generalized rash which involves the soles and palms. Arthritic involvement of large and small joints is a possibility.

Untreated, the disease subsides in about two weeks. Diagnosis is suggested by a rat or animal bite or scratch followed by the symptoms described above. An increase in the white blood count is typical and the organism can be identified in aspirated fluid from involved joints. There are specific serological tests which are accurate but unlikely to be available to missionaries.

Treatment parenteral (by injection) penicillin G 600,000 units every six hours for 14 days is curative for both types of the disease. Tetracycline, erythromycin, cephalosporin, and chloramphenicol are also effective. These drugs, which are given orally, are preferable for missionaries since needles and syringes are not required.

For the missionary

1. Eradicate rats in so far as possible by poison.
2. Any rat bite should be meticulously cleansed.

3. Administer antibiotics for any rat bite.
4. Handle dead rats with gloves or instruments.

Gonococcal Infections

Gonorrhea is an infection of the genitourinary system of both sexes caused by Neisseria gonorrhea. The disease is transmitted by sexual activity in almost all cases. Newborn infants may develop eye infection if the mother has active disease. The disease is one of the most common in the world.

This is not intended to be directed at missionary personnel except in the sense that they will invariably see native people with the disease who are prone to major complications which the missionary may help.

The primary disease in both sexes is initially an infection of the urethra. In the male, prostate involvement is common. In the female, vaginitis and cervicitis are universal. The primary symptoms are urethral or vaginal discharge and burning on urination. The diagnosis is made by identifying the bacteria of smear of the discharge.

Treatment of uncomplicated infection is as follows: Penicillin G 4.8 million units divided into two separate sites and together with one gram of probenecid orally. Alternately, ampicillin 3.5 grams orally with one gram of probenecid. For those allergic to penicillin, Tetracycline 1.5 grams orally initially and 500 mg four times daily for four days.

Complications: Men can develop urethral strictures which result in urinary obstruction. This may be partial but without treatment may become complete. This requires emergency catheter drainage before rupture of the bladder occurs. In women, the infection may spread upward through the fallopian tubes and produce large pelvic abscesses and/or pelvic or generalized peritonitis. This complication requires aggressive antibiotic therapy and often requires surgery. Both sexes can develop disseminated disease which results in septic arthritis, meningitis, conjunctivitis, myocarditis, and pneumonia. These all require medical help.

For the missionary

1. Men who present with total urinary obstruction must be transported to a medical facility.
2. Patients with multiple swollen inflamed joints and fever may have gonococcal septic arthritis and require medical help.
3. Girls and young women who present with severe abdominal pain, tenderness, and fever may have gonococcal abscess or peritonitis. They may also have appendicitis or peritonitis of other origin. Surgical help should be sought urgently.
4. The best treatment is prevention in which the missionary may be a source of instruction.

Granuloma Inguinale

This venereal disease is widely distributed in tropical Third World countries. It is more common in men. The organism is calymmatobacterium granulomatis.

This disease is generally confined to the genital area and adjacent groin and thigh areas. It may also involve the face, mouth and nose. Clinically, a vesicle or nodule appears first and progresses to an ulcerated lesion. The ulcer can spread to involve large areas of the genitalia with superficial destruction of the genitalia and with the development of vesico or rectovaginal fistulae.

The diagnosis can be made by demonstrating the characteristic Donovan bodies which are found in mononuclear white blood cell in material taken from the margins of lesions. Treatment includes Tetracycline 500 mg i.m. every six hours for 10 to 15 days. Streptomycin is also effective and is given in 4 gram daily injections for 5 days. Erythromycin and Chloramphenicol are also useful.

Lymphogranuloma Venereum (Bubo, Lymphogranuloma Inguinale)

This is a specific infectious disease caused by chlamydia trachomatis. It has worldwide distribution.

It is transmitted sexually in the majority of cases although it may be acquired in other ways. It has equal frequency in both sexes. Clinically, there is an incubation interval of a few days. A primary lesion, which may or may not be noticed, consists of a small painless papule, vesicle or ulcer which disappears in seven to ten days. These are always located in or on the genitalia.

There is a secondary stage characterized by enlarged inguinal lymph nodes. They begin as discrete nodes which enlarge and become matted and adherent to the skin. The skin over the nodes becomes discolored followed by ulceration or fistula formation which may last for months. In women there may be no symptoms until the lesion erodes into the rectum.

The secondary stage is accompanied by malaise, anorexia, headache, and fever. Some have chills and a septic fever curve. Invasion of the central nervous system is a rare complication.

A third stage in the female is characterized by proctitis, rectovaginal fistulous tracts about the rectum and perirectal abscesses. Scarring and rectal stricture are common. Chronic swelling of the genitalia is produced by lymphatic obstruction due to scarring.

Usually, diagnosis can be made clinically. Laboratory diagnosis is made by complement fixation test and by the Frei test. Treatment by tetracycline, chloramphenicol and sulfonamides are effective. Tetracycline 500 mg four times daily is given orally and reduced to 250 mg after four or five days. Sulfadiazine 3 to 4 grams daily is also recommended. Treatment should be continued for four to six weeks.

Trachoma (Granular Conjunctivitis)

This is a specific eye infection involving the conjunctiva, eyelid and cornea. It is caused by Chlamydia trachomatis. It may terminate and heal spontaneously or become chronic and recurring. Secondary infection can also complicate the picture. Blindness caused by corneal scarring and opacification. The disease is world wide and is most common in the Middle East.

Clinically, the disease may start acutely with severe conjunctival inflammation with exudate. In others, particularly children, a slower more insidious onset occurs. Simultaneous corneal involvement is always present. Corneal ulceration is invariable. Hypertrophy of papillae is a prominent feature replaced by severe scar formation. Diagnosis is usually clinical. Laboratory tests are confirmatory, if available.

Treatment is effected by administering tetracycline or erythromycin 250 - 500 mg four times daily for three weeks. Retreatment is sometimes required.

For the missionary

This infection is common and is easily diagnosed and should be treated early empirically,

Plague

This historic disease has ravaged the human race throughout recorded history and has destroyed more lives than any other bacterial disease. In the Middle Ages plague killed two-thirds of the population of Europe. It still occurs in small epidemics and as sporadic cases in many parts of the world including the Western United States, South Africa, East Africa, Southern Russia, Asia, and South America. The massive epidemics of the past have not recurred in many years but the threat is ever-present.

The causative organism is Yersinia pestis. There are two forms of the disease. Sylvanic plague, is most common in the United States, South America, China, and South Africa. Murine plague which is most frequent in India, China, Manchuria, Burma, East and West Africa, and South America.

The disease is a primary disease of rats and other rodents. In man it is the most lethal of all infectious diseases. Man acquires the disease by contact with infected rats or from fleas who have become infected from rats.

In the epidemic form in overpopulated areas the brown sewer rat and the black house rat are the vectors. In the pneumonic form droplet infection from coughing victims is a major source of infection.

Overpopulation, uncontrolled rodent population and poor or absent sanitary measures favor the development of this epidemic disease.

The clinical disease is divided into two types, bubonic plague and pneumonic plague. In the bubonic variety there is extreme lymphadenopathy and lymphangitis in the area draining the site of inoculation. The large nodes

are termed bubos. This lymphatic disease becomes widespread and destructive to the linings of lymph vessels and blood vessels. Severe visceral congestion involves many organs including the spleen and liver.

In the pneumonic form, a lobular pneumonic consolidation rapidly develops and spreads throughout both lungs. There is severe inflammation and edema of the air passages.

The clinical course of bubonic plague is initiated by an incubation period of two to four days. There is a sudden onset of chills and fever to 103^0 - 104^0 degrees with rapid pulse and respiration. Decreased mental activity, confusion progressing to delirium is characteristic. Conjunctivitis is present. Oliguria (diminished urine output) occurs in many patients. The white blood cell count may reach as high as 40,000. Blood stream infection occurs in nearly all patients. There is definite bubo formation in 75% of victims.

The pneumonic form has an abrupt onset with fever to 104^0. Painless cough and shortness of breath appears on the first day. The sputum is at first mucoid then becomes blood tinged. The white count is in the 30,000 to 40,000 range.

Primary septicemic plague can occur as the principal disease and often is a part of the pneumonic form and represents invasion of the vascular system. Cerebral symptoms appear early and toxic shock and disseminated intervascular coagulation are inevitable. This form of the disease is fatal in two to three days untreated.

Diagnosis in epidemics is obvious. Otherwise the clinical course, the appearance of a bubo and toxicity are diagnostic. The final diagnosis is made by finding the bacilli in material aspirated from a bubo, blood culture and sputum. *Laboratory personnel are at high risk in handling specimens from these patients.*

Treatment should be instituted immediately and empirically. Streptomycin 500 mg should be given i.m. every three to four hours until the temperature is normal. Thereafter 250 mg four times daily is used. Streptomycin dosage must not exceed 15 grams. Other drugs should be given with streptomycin such as Chloramphenicol, tetracycline, kanamycin, and gentamicin. Sulfadiazine may also be used.

For the missionary

1. Control rodent population at all times with poison.
2. Victims must be strictly isolated. All waste articles and bodily discharges should be burned.
3. Bodies of rats and human victims must be disposed of with extreme sanitary precaution.
4. A room previously occupied by a patient should be meticulously cleaned with bactericidal agents and treated with a residual insecticide (Diazonon, grammexeme).

5. All contact personnel should wear gloves, gowns and masks.
6. In epidemics, all areas around houses should be sprayed with insecticide to kill infected fleas.

Leprosy

Leprosy is a chronic infection by an organism closely related to tuberculosis, Mycobacterium lepre. The disease is widely distributed and is found in Asia, China, and some Pacific islands. It is still endemic in Africa and in several South American countries. There are sporadic cases in the United States.

There is a variable incubation from months to years. It is transmitted by *prolonged* personal contact. Host susceptibility plays an uncertain role in transmission. There is a balance between the virulence of the disease and the immunological status of the patient that determines the course of the infection. It occurs more frequently in young children and young adults with males predominating.

Clinically, there is an insidious onset which is difficult to diagnose early. First, there are a few very small nodules in the skin that are anesthetic and hypopigmented. In milder cases these nodules slowly increase in number on the extremities and back. The more severe or lepromatous cases develop diffusely outlined reddened nodules. There is invariable involvement of cutaneous nerves and larger nerves which produce extensive anesthesia, paralysis and trophic (degenerative) changes. Soft tissues of the involved areas, particularly fingers, are absorbed and in effect an auto amputation occurs. This may involve partial or complete loss of all fingers. The anesthesia results in numerous injuries and burns. The nose and larynx can be involved and destroyed. Severe cases can undergo extensive destruction of soft tissues. Death can occur but it will be years after onset.

The diagnosis is not difficult for the experienced observer. It is confirmed by finding the organism in the lesions. Treatment, until about forty years ago, consisted only of isolation. The appearance of the sulfones revolutionized the treatment and prognosis. There are now several drugs including DDS, DADDs and rifampin that are effective. Disability can be prevented by early treatment but in advanced disease with deformities the result is poor.

For the missionary

The missionary need not fear this disease. Casual contact with leprosy patients is not a threat. Certainly, one would not employ a patient with leprosy as a household employee or anywhere there would be prolonged daily contact. Recognized cases should be referred to a medical facility.

Bartonellosis (Verruga Peruana, Oroya Fever)

Bartonellosis is a bacterial disease caused by Bartonella bacilliformis and is localized to the Western part of South America in Peru, Ecuador and Colombia. The disease is carried by sand flies. There is no known host reservoir.

Pathologically, in more severe cases, there is enlargement of lymph nodes, spleen and liver. Clinically, in Oroya fever, the severe form begins with moderate fever, anemia, and mild jaundice. The hemoglobin level may fall 20 to 30% and the red cell count may drop as low as one to two million. The disease may improve but apparently predisposes the patient to secondary infections due to bacteria originating in the intestine. Salmonella and Amebiasis are common. Tuberculosis may also be incurred.

The benign form (verruga peruana) has a course of two to three months and is characterized by numerous hemangiomatous lesions which may bleed or ulcerate. They are more common on the face and extremities. Secondary infection may also complicate this variety. Those who develop major secondary infection have a mortality rate up to 50%.

Diagnosis may be suspected but is confirmed by finding the organism on smears or culture. This may not be possible in the mission field. Treatment with penicillin, streptomycin, tetracycline, and chloramphenicol are all effective. Treatment of the secondary infection may require a specific antibiotic.

Staphylococcal Infections

Staphylococcal infections in tropical areas of West Africa are much more common than in Western countries. This high incidence may be favored by the almost universal malnutrition and anemia. It is the opinion of many that Loiasis is in some way related to the numerous deep muscle abscesses that are seen.

Antibiotic therapy and surgical drainage are required. Bacterial resistant to antibiotics is not as extensive there as it is in the United States and therapy will be more effective. Deep abscesses in the gluteal area are a complication of the injections given by native doctors using unsterile needles and syringes.

Yaws

Yaws is a disease that occurs only in the tropics and is caused by a spirochete, Treponema pertenue. The organism is closely related to treponema pallida, the organism of syphilis. However, yaws is not a venereal disease.

The disease is common in all tropical areas, particularly West Africa, Caribbean islands, Central America, the Far East, and the South Pacific.

A peculiarity of yaws is that where it exists syphilis is not present. This infers some kind of cross immunity. The disease is transmitted from person to person by contact between a yaws lesion and a minor injury or abrasion. Flies

may also carry the disease. It is more frequent during rainy seasons and crowding and uncleanliness also favor the disease.

Pathologically, the disease is predominately a skin disease. Papules develop, become nodular and form large ulcerative lesions. There can be extensive soft tissue destruction.

The clinical course is preceded by an incubation period of several weeks. An ulcerating lesion develops which is termed a "mother yaw." This is accompanied by generalized aching, joint pains, and fever. Regional lymph node enlargement occurs simultaneously.

A secondary stage begins after a few weeks to three or four months after the initial lesion. Secondary lesions are granulomatous papules and are widely scattered over the body and of varying sizes. Successive generations of new lesions appear while older ones are healing. Bone lesions can also appear during this stage.

A third (tertiary) phase appears after a period of several years during which the patient has been free of symptoms. In this stage there are three types of skin lesions. There may be superficial spreading ulceration which eventually heals. Nodules of the skin may enlarge and necrose producing deep, slowly healing ulcers. These may become deeply pigmented. The third variety are hyperkeratotic areas of the skin on the soles of the feet and the palms. These can become very thick, fissure and ulcerate.

Destructive lesions can develop in bone and involve periosteum. These resemble the lesions of tertiary syphilis. They result in pain, swelling and occasionally ulcerate through the skin. The tibia, radius, ulna, humerus, and femur are most often involved. The bones of the hands can also be affected. The palate and the nose can be the site of severe destruction.

The diagnosis of yaws can often be made by the clinical appearance. The diagnosis is confirmed by finding the spirochetes in the exudate of ulcerated lesions. The serologic tests for syphilis will be positive and, therefore, are of no value. The differentiation of syphilis and yaws may be difficult or impossible.

Treatment of yaws is principally penicillin. Procaine penicillin, 1,200,000 units in 2% aluminum monosterate is most often used. Benzathine penicillin can also be used. Tertiary yaws is more difficult to treat and may require repeated and prolonged therapy. Oxytetracycline and chlortetracycline are also useful in treatment. Surgical excision and amputation may be needed.

Leptospirosis (Weil's Disease, Pretibial Fever)

This is a spirochaetal disease which is found in many tropical areas. It is most prevalent in Asia. There are a number of subtypes.

Small rodents are the natural reservoir but other mammals can be infected.

Probably, moist soil and low water harbor the organism and favor invasion. Infection most likely begins with penetration by the organism through a small wound or abrasion or through a mucous membrane. Workers exposed to infected animals and infected water such as stevedores, farmers, exposure in swamps, and slaughter houses are at risk. Most infections occur in South East Asia.

Pathologically, there are extensive changes as inflammatory reaction in most organs. Hemorrhages also are present in most organs. Perivascular inflammation or vasculitis are prominent features. Areas of necrosis are widespread in skeletal muscle. Nephritis is constant and important. There are significant liver changes resembling viral hepatitis. There may also be meningeal and cerebral changes.

Clinically, there are all degrees of severity from asymptomatic to fatality. It begins with an influenza-like illness which may be associated with evidences of hepatitis and kidney involvement. Pneumonitis, meningitis and skin rash are also common. The severity is probably related to the virulence of the organism and the susceptibility of the host. There is an incubation period of one to two weeks. Severe headache, severe myalgia, chills and fever and severe prostration then develop. These symptoms last about one week then subside with few symptoms for one to three days. Then there is a recurrence of symptoms with evidence of liver and kidney disease. Jaundice is not common. Both kidney and liver involvement (Weil's disease) can develop.

The prognosis is variable. Most patients recover but there is a significant mortality rate. The diagnosis is difficult because the symptoms are those of many other diseases. The diagnosis can be established by identifying the spirochete in blood, spinal fluid or urine. There are several useful laboratory tests which will probably not be available in the mission field. Any of a number of antibiotics can be used for treatment and these include penicillin, streptomycin, tetracycline, chloramphenicol and erythromycin. Penicillin is preferable. Ten to 20 million units given intravenously daily for four days is the usual regimen.

For the missionary

In endemic areas the only useful procedures are the eradication of rats, avoidance of contaminated water for drinking and bathing and wearing of protective shoes and clothing.

Rickettsial Diseases

Rickettsiae are a group of organisms which have some characteristics of viruses but more of bacteria. They are unique enough to be classified separately. They are all transmitted by ticks, mites, fleas, and lice. There are a number of small animal hosts. There are five human varieties: Typhus group, Spotted Fever group, Scrub typhus, Q Fever, and Trench Fever.

Epidemic Typhus Fever

This disease is distributed throughout the world. There have been many epidemics, most notable of which was the one involving the soldiers of World War I and one in Russia in 1918 to 1922 in which three million deaths occurred. The reservoirs are rats and the transmitting agent is the human body louse.

The pathological features of the disease include thrombosis of small arteries and capillaries. The skin, central nervous system, spleen, liver and kidneys are all involved. Bronchitis and pneumonia are common.

There is an incubation of five to fifteen days followed by a 24 to 48-hour period of headache, vertigo, backache, anorexia, and malaise. The temperature then rises to 103° - 104°. The face becomes flushed, conjunctivitis appears and the state of consciousness becomes impaired. Prostration is marked. The characteristic rash appears from day three to seven. It develops first in the axillary area and flanks and spreads over the whole trunk then to the extremities. The face is not involved. The rash first is an erythematous (reddened) one then becomes hemorrhagic. The patient becomes more ill with the appearance of the rash. Headaches become more severe and stupor increases. The pulse may become weak and the systolic blood pressure is lowered.

From this point, the patient undergoes a striking change. The fever suddenly subsides along with episodes of profuse sweating. The mental confusion and stupor disappear. The pulse and blood pressure do not return to normal for several days. The neurological symptoms may become worse and coma ensue. These patients, with progressive neurological disease, usually do not survive. In others the convalescence continues but is prolonged. Bronchitis and bronchopneumonia are common complications.

Clinical diagnosis may be difficult but in an epidemic area becomes obvious. Typhoid fever, relapsing fever, malaria and scrub typhus all have to be considered. The diagnosis can be established in the laboratory by the Wiell-Felix reaction and by complement fixation tests. There are other laboratory procedures but in the mission field these are not likely to be available. The white count is elevated but is seldom higher than 10,000 to 12,000.

Treatment by the tetracyclines is effective and should terminate the disease in about 72 hours. Vibramycin is probably more effective. Preventive measures include immunization with one of two types of vaccine. One contains a live attenuated organism and is preferable. The other of killed virus is not as effective. Strenuous effort to control body lice should be made and clothing should be treated with an insecticide. Delousing, in the epidemic situation, should be a community wide effort.

For the missionary

Any evidence of body lice in an area endemic for typhus should result in a serious effort to eradicate them by using lindane 1% solution for skin application and washing and sterilizing clothing and bedding. The disease will not be transmitted person to person.

Murine Typhus Fever

This is a mild viral infection similar to typhus. It is transmitted by rat fleas with the introduction of flea feces into a bite wound or another wound or abrasion. The hosts are common rats.

Clinically, the onset follows an incubation period of one to two weeks and may be sudden or gradual. Fever may be from 102° - 105° and lasts for about two weeks. The rash is similar to the rash of epidemic typhus and appears about the fifth day and persists from two to ten days. There is no mortality and convalescence is usually rapid.

Treatment is tetracycline. Prevention is best assured by rodent control and insecticide for fleas.

American Spotted Fever

This illness was once termed Rocky Mountain Spotted fever but has now been found to be endemic in British Columbia, Alberta and Saskatchewan in Canada, and in Mexico, Panama, Brazil, and Columbia. It is transmitted by ticks (D. Andersoni, A. Cagemense and Americana). Rodents are the host reservoir.

The pathological changes are similar to typhus with injury to vascular endothelium and muscle of small blood vessels. The rash may become hemorrhagic.

Clinical disease. The illness may be mild or severe. In the severe form there is a sudden onset of headache, chills and pain in the joints and muscles. The temperature gradually rises to about 104°. The rash appears on the third or fourth day first resembling measles but remains discrete. It begins on the forearms and ankles spreading rapidly to the extremities and trunk. Later it appears on the forehead, palms, soles and scalp. In three or four days the rash becomes petechial (hemorrhagic).

The white count is moderately elevated and blood platelets are diminished. The disease reaches its height during the second week and deaths occur during this time. After the 14th day improvement begins and fever subsides. The mortality in untreated cases is 5 to 10%.

The diagnosis is suspected if there is a history of a tick bite. The disease clinically resembles typhus. Serological diagnosis is accurate after 10 or 12 days. The organism can be recovered from the blood on culture.

Treatment consists of tetracycline or chloramphenicol. Two grams are given as an initial dose and 250 mg is given every 6 hours for at least 10 days. Prevention consists of immunization in endemic areas.

For the missionary

1. Avoid tick infested areas if possible.
2. Treat clothing with repellents such as diethyl tolbutamide.
3. Inspect body for ticks several times daily.
4. Remove ticks with forceps and not with hands.

Scrub Typhus

This is an acute typhus-like disease which is transmitted by larval trombilculid mites (chiggers). It is endemic in East and Southern Asia and in the islands of the South Pacific and Western Pacific. Specifically, it is present in the Philippines, New Guinea, Ceylon, islands of the Indian Ocean, and to a much lesser degree in Europe and America.

The organism is Rickettsia Tsutsugamushi orientalis and is an intracellular organism. An intermediate host is wild rats. Man is not an obligatory part of the life cycle but is essentially an accidental host. The life cycle of the rickettsia can be entirely within the mite.

Clinical characteristics. The disease can range in severity from subclinical to fatal disease. The initial chigger bite usually is unnoticed but in most cases it can be found to be a papule which progresses over two weeks to an ulcerated lesion covered by an eschar. The regional lymph nodes become enlarged and painful. Prodromal symptoms of headache, weakness, malaise, and loss of appetite are typical. The onset is sudden with fever ranging from 103° - 105°. Severe headache, ocular pain, conjunctivitis, generalized aching, apathy, and cough are typical.

Signs of pneumonia are often present. About the sixth or seventh day a rash appears, first on the trunk then spreading to the extremities. Generalized lymph node enlargement is present by this time. During the second week all clinical signs mentioned persist and evidence of multiple system involvement becomes obvious. Apathy changes to delirium, restlessness, stupor, coma, and convulsions. Muscular weakness, tremor and hyperaesthesia are present. Cranial nerve involvement is often present.

Dysarthria and difficulty in swallowing appears. Cardiac disease is not common but is evidenced by frequent premature beats, systolic murmurs, gallop rhythm, enlargement, and rarely congestive failure.

If the patient is untreated there is defervescence beginning from 14 to 21 days. The convalescence is prolonged and there is a significant mortality rate.

Diagnosis is made difficult in separating scrub typhus from epidemic typhus and other rickettsial infections, dengue fever and hepatitis. A mite bite with an eschar should point to the diagnosis. A well-equipped laboratory can usually make an accurate diagnosis with serological studies and by inoculating mice with blood or serum. These facilities are not likely to be available.

Prompt treatment with tetracycline or chloramphenicol will usually terminate the disease in 24 to 48 hours and prevent fatality. Initial therapy is 2 to 3 grams orally followed by 500 mg every 6 hours until the patient has been afebrile for 48 hours.

Prevention:

1. Clothing can be treated with emulsions of benzyl benzoate, dibutyl phthalate or dimethyl phthalate.
2. Use insect repellent containing DEET.
3. Brush and vegetation should be cleared from around living areas and the area sprayed with insecticides.

Related Spotted Fevers and Rickettsioses

(Boutonneuse fever, Kenya tick-bite fever, South African tick-bite fever)

This disease, or group of diseases, is caused by R. Conorii or a variant and is transmitted most often by a tick common to the Mediterranean area and India. There are different species of ticks that transmit disease in South Africa.

The pathological lesions are not known since all of the patients survive.

Clinically, there is an incubation period of about one week after which there is a sudden onset of fever, headache, malaise and conjunctivitis. There will be evidence of a tick bite with an eschar over it. The symptoms are less severe than in American Spotted Fever. The illness lasts about one week with a rash appearing from day two to day five.

The diagnosis is suggested by the symptoms plus the visible tick bite. As in other rickettsial infections, laboratory diagnosis is possible if the facilities are available.

Treatment by tetracycline or chloramphenicol is effective.

Q Fever (Nine Mile Fever, Balkan Grippe)

Q fever is a worldwide disease except in Scandinavia. Many species of ticks are carriers but rarely transmit the disease to man. Many mammals are infected including sheep and cattle. Man is most often infected by inhaling

contaminated dust from animal areas. Milk of infected animals can also transmit the disease.

Pathologically, lesions are found in the lung primarily but also in the spleen, liver, kidney and brain. The lung disease resembles lobar pneumonia. Rarely there may be cardiac involvement.

Clinically, symptoms appear acutely after an incubation period of 12 to 30 days. There is recurring fever, chills, sweating, generalized aching, malaise, and anorexia. There will be cough and chest pain and the chest x-ray will reveal a widespread pneumonic process. The mortality rate is about 1%.

Diagnosis can be suspected when there is a febrile illness in patients who have a history of contact with sheep or cattle. Laboratory diagnosis can be made if facilities are available. Like all rickettsial infections Q fever can be treated with tetracycline and chloramphenicol, however, higher doses may be required in order to obtain a response. Relapses are common. Until a reliable method of eliminating the disease in livestock or of eradicating ticks, control will not be possible. Drinking of pasteurized milk will eliminate this mode of transmission.

Trench Fever

This infection is louse borne. It is not as serious as some of the other rickettsial diseases. The transmitting agent is the human body louse. The name refers to the number of World War I soldiers who were inhabiting trenches for prolonged periods and who were heavily infested with lice. The mechanism of transmission is the introduction of lice feces into a minor wound or abrasion.

There are minimal pathological changes.

Clinically, symptoms are very variable and of all degrees of severity. There is a 10 to 30 day incubation period with prodromal symptoms of headache, malaise and generalized aching. Toward the end of the incubation interval, there is then an acute onset consisting of severe headache, vertigo, back pain, extremity pain, orbital pain, conjunctivitis, and elevation of temperature to 103° - 104°.

The febrile period may last for as long as a week but may occasionally last several weeks. Multiple relapses will occur in about half the cases. Three or four are typical. There will be a distinctive typhus-like rash but there are fewer lesions and they often disappear within 24 hours. The recovery period is prolonged and the patients persist in having a multiplicity of symptoms and dysfunctions.

The differential diagnosis must consider influenza, dengue fever, malaria, and brucellosis. The diagnosis can be proven in the laboratory if one is available.

Treatment with tetracycline and chloramphenicol is effective and other wide spectrum antibiotics are useful.

Prevention is obviously based on the control and eradication of body lice. The patient's urine and stool are infected and can transmit the disease, therefore, disposal must be with care.

For the missionary

Prevention of all of the rickettsial diseases has several features in common:

1. Avoid, if possible, areas known to have a high incidence of any of these diseases. This is particularly important in epidemic typhus and scrub typhus.
2. Use every means to control and eradicate rats, ticks, lice, and mites. These measures include repellents and treatment of clothing.
3. Wear occlusive clothing if you must go out in the bush and wear elastic bands around ankles and wrists.
4. Search for ticks several times each day and always look for lice which are not always easily seen.

Chapter 11

Caring for Children on the Mission Field

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In writing this chapter, the biggest problem was finding resources for information. Probably the best resources are those people in health care who are presently on the mission field with their family or have had their families there before. In the church that seems to be a limited number. Other sources of information are the Center for Disease Control, the American Academy of Pediatrics, and other governmental and medical organizations.

I have been a practicing pediatrician for 30 years and have made several short term visits to Central America. With my wife, Suzanne, I spent two years, 1993 and 1994, working at Clinica Amicus in Honduras. My children were grown by that time, so we did not have to deal with having our children with us on the mission field. I also went to Nigerian Christian Hospital with Dr. Maurice Hood and worked for a month there in the early eighties.

That experience should provide me with some insight into this question. I will attempt to bring the knowledge from my own experience, what I can pry out of other medical people, and the standard medical resources to this chapter.

Mental Well Being

This chapter begins with the mental well being for children on the mission field because of its tremendous importance. Too often in the past it has not received enough serious attention by those heading for the mission field. Lip service to this aspect of healthy preparation is a sure way to significantly reduce your chances of success. Group interaction study and practical learning of these skills are also very important. Hopefully, the days where members of the church head out to the mission field mentally or emotionally "cold turkey" are gone. All now recognize this method as a recipe for disaster.

This is no less important for children than adults, and perhaps even more so for teenagers.

If your plans are to go alone, with your family, or with a group, you need to seek out someone trained in helping missionaries prepare both mentally and emotionally. The church has well trained and very capable people that are available to advise you and help prepare you for this important work. Most of them are associated with Christian colleges. There is probably

someone in the psychology department at all of the colleges, known for their interest in helping missionaries get to the field to do their job successfully and then get back home adjusted and emotionally healthy.

I am going to be a name dropper, mentioning the two people who helped Suzanne and me decide when to go or when not to go, and how to go or how not to go. Also, their help allowed me to recognize important aspects of group relationships and how to develop skills in dealing with groups. I am sure that there are many other people that you may consult with.

The first person to give me such valuable instruction was Dr. Carl Mitchell at Harding University. This was during a seminar for those heading for Nigeria in 1982. Dr. Mitchell spent most of the time on helping us to understand group relations and to develop some skills in that area. His lessons have been of great value to me and prevented me from making a good many more mistakes than I made. I still try to remember and use what he taught me in dealing with others. See Chapter 2 by Dr. Mitchell.

Certainly there are no more important group relations than the relationship within your own family. All of us can benefit from examining the dynamics of our family's interrelationships with someone trained in that area. Such an effort will give the family a chance to strengthen its skills at getting along. The mission field will test how they, as a family, deal with and relate to each other. Unrecognized problems are more likely to surface, with the added stresses of adapting to living in a new country. So, getting some knowledgeable assistance and looking at your own family's dynamics may be one of your most useful steps in preparation.

The other person is Dr. Clyde Austin at Abilene Christian University. It was Dr. Austin who interviewed my wife Suzanne and me, when we began thinking of spending two years in Honduras. He gave us the usual psychological tests and interviewed each of us. He made several recommendations which we took. When the proper time came for us to go, we were able to successfully go for two years and return and have settled back to our work here at home.

It was Dr. Austin who first explained to us how returning home could be more devastating than the going, if you were unprepared. On returning, we found that to be very true. Listening to his counsel and putting it into practice made our return, if not easy at least manageable. He not only counsels many in the church but many organizations outside the church seek him for his expertise. He helps people in going to foreign countries to live and in accomplishing reentry successfully.

Both of these men have lovely and talented wives who can also add their insight. Both Frankie Mitchell and Sheila Austin have lived in the foreign field with their husbands. They played a big part in their success, as all wives do.

Certainly, this was also true of my wife, Suzanne, who is a medical technologist. In the beginning, I thought she had come to help me – the doctor. Later I decided that the Lord had led me to come in order to get Suzanne on the mission field. She was able to contribute so much more than just her medical skills. When not busy in the lab, she gave her help to all those that we worked with and treated at the clinic. She seemed always to be available to the students and students' wives at the Christian college that the clinics campus adjoined, called Baxter Institute.

Ideally the whole family should have some familiarity with the area where they will be working. Sometimes it may not be possible, but I believe it is a real step toward success. I am not speaking of reading about it, although that is certainly good as well. I am speaking about making some short term visits to the area with your family before the final departure. Many times this would be expensive, but it would also be a big asset. Meeting some people you will be working with, staying at a hotel or with fellow workers, and getting more familiar with the sights and sounds of the area on short visits will really help you in accommodating to your new environment.

We had made several short term visits to Honduras and met many of the people that we would be working with before we went for a longer period of time. We both remember quite well our first trip. We went to visit Dr. Robert and Doris Clark in Catacamas, Olancho, Honduras, C.A. Doris picked us up at the airport in Tegucigalpa and we checked into the Granada Hotel. The room was small and bare with a very small bathroom, a small closet, and minimum double bed. There was no hot water. The walls were white and the floors were a light colored tile. It really seemed to be a very bleak and bare beginning.

After we had stayed in Catacamas, a mountainous area, for eight days, spent a night in bunks, six to the room, bathed in the creek, and had several other truly wonderful experiences, we returned to the Granada Hotel in Tegucigalpa.

When we returned to the Granada, it seemed to us as if they had remodeled the hotel. Everything looked so clean and neat. The atmosphere seemed to have completely changed. Even the cold shower took on more attraction. That is the way we humans are. Many say that familiarity breeds contempt, but it can also breed comfort and acceptability. So, before you take the big plunge, remember, the more accustomed and familiar your family can become with the country, the people, and the circumstances before going, the easier will be your adjustment, and the happier you are going to be.

Communicable Disease Precautions

Much of the information in this section is primarily directed at living in Third World countries. However, many areas may be helpful for those

planning on living in modern cities in other parts of the world. In countries of the Third World, conditions of sanitation and health care are most often well below those in which we are used to living. This requires some reeducation and of course some changes.

Changing and facing change is difficult for everyone. But, of course, changing is what being a Christian, as well as a missionary, is all about, so we as Christians may be better at change than most people.

Children's contact with nationals, food products and water

The well-known scriptural truth, "cleanliness is next to Godliness," is a good foundation for everyday living and thinking in the Third World. "An ounce of prevention is worth a pound of cure" should fit in there, too. I have known people who took being careful about what they would eat or drink while in a Third World country to such an extreme that their behavior was funny to me. I can assure you, however, that even that course is wiser than the person who takes the brave and careless attitude about hygiene in this type of environment.

The best way to regard cleanliness is to be a good and frequent hand washer. Lots of water is more important than lots of soap in hand washing. Do not become a maniac about it – just do it – and be sure to help your children learn to do it. You do not have to wash them every 15 minutes, but several times during the day, like after children playing outside or on the floor, after cleaning an area, certainly before eating anything, and after any contact with someone ill. Also, after receiving visitors, it would not hurt to wash your hands when they leave. They will be gone, so it won't hurt their feelings.

Personally, I also believe we should wash our face or rinse it off more often than we normally do. Many common respiratory illnesses, like influenza, are spread from our hands to our nose or to our eyes as we touch them or rub them. I remember an ear, nose, and throat specialist reporting an epidemiological study where they counted the number of times an hour people touch their eyes or nose. It was so often that it was hard to believe. When we unconsciously do that, then we possibly transfer any bacteria or viruses that we have contacted with our hands to the conjunctiva of our eyes or the membranes of our nose. The eyes and nose are good entry portals into our bodies for these organisms. Washing our face a few times a day, like before meals, cannot hurt and may save us from some sick days.

The best rule about what to eat or drink is to listen to the other Americans who have already lived in the country for some time. The bacterial flora of their digestive system has already become somewhat similar to the nationals. Though they may be able to eat something that will give you some diarrhea, it will not be anything more than a short bout of diarrhea

and nausea. They can tell you what eating places they use and where they drink the water, etc. just be sure they are not one of the wild and careless, let's go native, variety. Always remember, it is better to be safe than sorry or, in other words, it is better to be the doctor than the patient!

Remember, most episodes of vomiting and diarrhea are viral in nature and are spread from person to person not by food products or water, unless they were contaminated by the sick person. The incubation period (the period of time from when you come into contact with the virus until you become sick) for most of these intestinal viruses is about 6-9 days. Therefore, many travelers who get sick on short trips to foreign countries actually contacted the virus before they ever left home.

One of my firm rules while in Honduras was to buy no fresh food products from street vendors and consume them there. Fresh vegetables and fruits were always taken home and washed and lettuce allowed to stand in salt water to kill the amoebae. Lettuce can harbor amoebae such as Giardia that can make you sick with a great amount of diarrhea and abdominal cramps. Stay away from fresh fruit already peeled. Of course you could peel any fruit yourself and eat it there, safely.

Foods prepared on the street or in places that you are unfamiliar with are to be avoided.

The safest course is to stick with bottled water if you are not sure. Liquids in bottles or cartons like carbonated drinks and fruit drinks should be safe. These can usually be purchased from your car or your bus as you travel.

Immunizations against communicable diseases are the best way to avoid them. So, children and parents must take advantage of all that are available whether we want to or not. Of course, all should have the basic immunizations for citizens of the USA, and they should be current. Be sure you have the basics, before you worry about the exotics.

We are in a fast changing period in relation to recommendations for immunizations for foreign travel, as well as recommendations for children here in the USA. Also the recommendations are usually regionally specific. It would not be best for me to try to describe the current recommendations here, that would be outdated before this is published. Therefore, I believe that anyone going on a trip to any foreign country should check with the proper USA authority for the most recent recommendations. The following are suggested organizations from which to acquire the information.

The Center for Disease Control is one of the best and up-to-date sources of information for foreign travel. It certainly is the most easily accessible place to obtain this information. The CDC annually publishes a monograph entitled "Health Information for International Travel." You may purchase

the monograph from the CDC by requesting it from, Superintendent of Documents, US Government Printing Office, Washington, DC 20402-9235. Phone 202-512-1800. It makes about the most recent and reliable recommendation that you will find. The cost should be about $14-$16.00.

The other great source that the CDC has is on the Internet at <http://www.cdc.gov>. When you get them, select "Travelers Health," then you can browse through a mountain of information on all aspects of health in various countries. This is a wonderful resource both before you go and after you get there.

You may also call the Center for Disease Control at 202-512-1800 and request information on one of 16 specific regions listed. This information will be faxed to you, so be sure to have your fax number handy. There is no charge at this time for faxing this information to you.

Other sources are the American College of Physicians, the American Academy of Pediatrics, and other medical organizations. However, the Center for Disease Control is the only one making annual recommendations and making them regionally specific.

Preventive Medications

Taking medication to prevent illness is usually not helpful because it is not effective. There are a few exceptions to that. The most important exception is medication to prevent or suppress malaria. Aralen, a brand of Chloroquine phosphate, is used to suppress malaria. Suppressive therapy is begun two weeks before arriving in the area and then continued for eight weeks after leaving the area where malaria is prevalent.

People who have had Rheumatic Fever are another example of those that should take preventive medication. They should take penicillin or some effective antibiotic to prevent strep throat for the rest of their lives.

Some international travelers take an antibiotic to prevent traveler's diarrhea. The necessity of taking this medication depends on the specific threat in the area into which you are going.

Insect Vectors

Mosquito born disease is still prevalent in many areas of the world. For malaria there is suppressive medication as described under the heading, Preventive Medications. Otherwise there is avoidance of mosquitoes. Avoidance is accomplished by using mosquito netting for sleeping and by taking precautions in your home and office with proper screening. Also taking more care to wear clothing that covers the body during the hours of highest activity of mosquitoes. It is good to point out here that anytime one experiences fever and chills in malaria areas they should seek medical attention where available.

HIV

We all should know by now how the virus of HIV is spread. It is by sexual contact and contact with blood or blood products. There are no different mechanisms to avoid this risk in foreign countries that are not practiced in the USA. The risk of contacting someone with HIV is certainly greater in different parts of the world and the highest risk countries are usually in the Third World.

What To Do When Children Become Ill?

Of course, the answer to that question depends on who you happen to be. If you, yourself, are a physician, then you have the answer already. However, if you or a family member is not a physician or other health care giver, then you probably need some help when someone close to you in the mission field becomes ill, especially a child.

The easiest advice is to do the same thing that you would do if you were at home. If that includes calling a doctor, then do that, if one is available. If a doctor is not available then try a nurse or other health care worker that may be available. In many areas there are very capable health care personnel, and often there is someone from the USA or other modern nation. If there are no health care givers that you are comfortable with, then you have to look to other alternatives. I will make a few points that I have found helpful to my patients. Otherwise you will need some good references to use when situations require an alternative for a trained health care giver.

Perhaps, all you have to do is give a child with fever some Tylenol (acetaminophen) or Motrin (ibuprofen). Over the years I have found a lot of misunderstanding about sponging for fever. Many people put the child into the water. Others put wet clothes on the child. Both will help. However, the most rapid method is to "sponge." Sponging is simple. You need a pan of tepid water and a bath rag. The child is stripped down to diaper or underpants. The tepid water is then spread over the child's body with the wet rag. Then you wait 2-3 minutes for evaporation of the water to begin taking the heat away from the child's body before repeating the process. Water evaporating from the skin takes a lot of heat with it, much more that just the difference between the temperature of the water and the skin. Putting the child in the water simply provides the difference in the temperatures of the two, the water and the skin.

In the Third World more children are saved by a knowledge of the principles of proper hydration and dehydration than anything else, in my opinion. This is certainly something you want to know and teach those around you. Immunizations are second. The ready availability of packets of rehydration solution provided by many of the governmental agencies has

made a great difference. Many areas have stations in the home of someone in the neighborhood where these can be obtained free of charge.

The process is simple. When a child has vomiting or diarrhea they are taken off milk and food and given the rehydration solution. One packet of the solution is added to one liter of pure water and the child is kept on this until the vomiting ceases and he can tolerate milk. This is successful even if the child is dehydrated in most cases.

In Honduras soon after arriving, I was faced with a 6 week old infant who appeared very sick. He was obviously severely dehydrated and very lethargic (difficult to awaken and not responsive). In the USA he would be admitted to an intensive care unit in no time flat and be given fluids intravenously. I asked the Honduran physician about getting him to the hospital and he explained, sadly, that this was not an option for us. Instead, he suggested I try letting the mother give the child the rehydration solution with a dropper. This I did.

We were busy and time went by quickly. I passed by the mother and child several times and she was always giving the child a dropper of the solution. After about three hours, the child's hydration had obviously improved and he was more alert. After 6 hours the child's hydration seemed normal and he was alert and responsive. It was hard for me to believe this was possible with oral rehydration. The next amazing thing was when I noticed that in those six hours, the mother had given the child the whole liter of rehydration solution. We could not have done that intravenously in such a small child without risking producing congestive heart failure from too rapid a fluid replacement.

Sore throat and fever are strep throat until proven otherwise. You will get over the strep throat without antibiotics, although it will take longer. The problem develops because, without an antibiotic, the strep infection of the throat may rarely be followed by Rheumatic fever. If you cannot find out wether it is definitely strep throat, then it is better to treat it as if it were strep throat. This will require obtaining an antibiotic from a pharmacy.

If you are in an area where there is no trained health care provider, the first thing to use is common sense. You have much knowledge about health care just from being from a high tech country. Do not panic. Use what you know. Remember, many problems people have when they go to the doctor are self limited and will get well without any medication. Most febrile illnesses are viral and the body will recover. Also remember that fever may make you uncomfortable and nauseated, or give you the headache or chills but it is extremely rare for it to be dangerous in itself. Just take something to reduce the fever and give the medicine time to act.

It is obvious that I cannot put a pediatric handbook together for you in this chapter, so I suggest taking some reference sources. There are two listed under "A Personal Library," in this chapter that are helpful and should be considered essential. *Where There is no Doctor* is a book designed for use by anyone in a Third World situation where there are no health care providers available. It is more than just first aid. The book contains directions for many serious situations and illnesses. It also contains a list of important drugs, their use and their dosage. There are also suggestions for situations where you can substitute things you have on hand instead of prepared medications.

Helping Health Care Workers Learn is another book that is also very helpful on the mission field. The purpose of this book is to help teach nationals how to deliver health care to their own people. Naturally, it can help you do the same thing to people who come to your door seeking help, or your own family. Both of these books were written by David Werner with Bill Bower as coauthor of the latter book. I believe you will find them very helpful for your family as well as others.

The things that save the most children in a Third World environment are the simple things related to proper hygiene, knowledge of principles of hydration, clean water, proper food, avoidance of fecal contamination, and immunizations.

To obtain the two books, write the Hesperian Foundation, PO Box 1692, Palo Alto, CA 94302, Phone: 415-325-9017, Fax: 415-325-9044. The cost should be about $20 each. It will be well worth it, and you may even become the best health care worker in your area.

In most areas of the Third World, you do not need a prescription to buy medicine at the pharmacy. All you need is to know the name of the medicine, and then go to a pharmacy and purchase it. Sadly, the nationals are often prevented from doing this because they lack the money it takes to buy medication. Of course, you will need to know the proper dose, side affects, etc. For this reason, I suggest that you take some sort of reference on drugs.

There are various ones of these available. You may find them through medical publishers. One that physicians use most is, the *Physicians' Desk Reference* known as the PDR. Physicians generally receive them without cost. Most physicians have one from the previous year that would be perfectly adequate for use in the field and would they probably be glad to give it to someone headed for the mission field. You can also order one at the address listed in the "Personal Library" section at the end of this chapter. The cost is about $70-$80.

Let's review where we want our efforts to be in thinking about taking our children to the mission field. The three most important tasks are: preparation, preparation, and preparation. It is absolutely essential that this preparation include everyone. We want our family to be emotionally prepared. To do this we seek help from qualified people who deal with our emotions and interrelationships.

We want to be mentally prepared. For this we need to help the family find out as much as we can about the area where we are going regarding all aspects of living there. That includes items related to our health while there. Hopefully we can take some short term visits to the area to become more familiar than is possible otherwise.

We can see that in order to take care of the health needs of our family and those around us, we must gain what knowledge we can before going and then take some good reference material with us. We need to find out about health risks in the area so that we can be prepared to deal with them before we leave.

Finally, and most importantly, we want to be spiritually prepared. We all know that this comes through reading and studying God's word and through prayer. This certainly we can never neglect.

I am sure everyone knows people who left for the mission field with little preparation and did a wonderful work. Thank God for people's strength and faith and for God's mercy. What most of us do not know, is how many wonderful, loving, and faithful Christians have gone, only to have things go somehow terribly wrong and have to return to rebuild their lives. Although proper preparation alone will not guarantee success, without it your chances for success shrink significantly.

I know that if you are reading this, then you are probably thinking about serving God in this way. My heart is lifted by knowing that to be true. I hope this chapter helps you in some way. My prayers will always be with those who choose to serve our Savior by making the sacrifices that it takes to go to a foreign field. What you can do for the people will lift them up in many ways. By leading some of them to Jesus, you will have done even a more wonderful and everlasting work. God bless you!

A Personal Library

The following books are all excellent resources for those considering going into the mission field.

A Man With World Vision. Gurganus and Garringer. Bro. B.D. Moorehead. J.C. Choate Publications, Burton Drive, Winona, Mississippi 38967.

Anthropological Insights for Missionaries. Paul G. Hiebert, Baker Book House, Grand Rapids, Michigan 49506.

Communicating Christ Cross-Culturally, David J. Hesselgrave, Zondervan Publishing House, Grand Rapids, Michigan 49506

Helping Health Workers Learn. David Werner and Bill Bower, Hesperian Foundation, PO Box 1692, Palo Alto, California 94302.

Living Overseas. Ted Ward, The Free Press, 866 Third Ave, NY, NY 10022

Medical Care in Developing Countries. Oxford University Press, Lusaka London.

Missionary Know Thyself. Bert M. Perry, J.C. Choate Publications, Burton Drive, Winona, Mississippi 38967

Pediatric Priorities in the Developing World. David Morley, Butterworth, Inc., 10 Tower Office Park, Woburn, Mass. 01801.

Peace Child. Don Richardson, Regal Books, G.L. Publications, Ventura, CA.

Physicians' Desk Reference. Physicians' Desk Reference, PO Box 10689, Des Moines, IA 50336-0689

Please Doctor. R. Maurice Hood, MD, 1989, Gospel Teachers Publications, Inc., PO Box 210888, Dallas, TX 75211.

"Sojourners" Women With A Mission. Joyce Hardin, Korean Consolidated Corporation, 219 Longlim-Dong, Inchon, Korea.

Stalking Wild Disease, Demons, Distance, Death, and Disasters in Africa. Henry Farrar, MD, Church of Christ, 3534 West End Ave., Nashville, TN 37205. African Christian Hospitals, 102 Northe Locust, Searcy, Arkansas, 72143.

The Dew Breakers. Dow Merritt, J.C. Choate Publications, Burton Drive, Winona, MS 38967

The Silent Language. Edward T. Hall, Anchor Press/Doubleday, Garden City, NY

We Have No Rights. Mabel Williamson, Moody Press, Chicago

Where There Is No Doctor. David Werner, Hesperian Foundation, PO Box 1692, Palo Alto, California 94302


YOU HAVE HOW MANY KIDS?

Chapter 12

Obstetrics Where There Is No Doctor or Nurse

Robert Mahaffey, MD
Tulsa, Oklahoma

Deciding to Go or Stay in the Mission Field If Pregnancy Is Present or Contemplated

Although infants are born all over the world and have been delivered by untrained or poorly trained individuals with good outcomes at times, having a baby in a remote environment is risky even for the medically trained. Spontaneous termination of pregnancy, stillbirth and even maternal mortality are markedly increased, even in the USA, where women have poor prenatal care or have poorly skilled attendant present at birth. Some common medications safe for the nonpregnant woman are dangerous to use in pregnancy. Certain infectious diseases that might not be of significance in the nonpregnant patient may become quite serious causing premature labor or even maternal death in the pregnant patient. The following are some general thoughts that might help one decide whether or not they would want to stay in the mission field if pregnancy occurs. Consideration should be given to the woman's age, health status, what level of medical care is available locally, and what might be attainable in an emergency occurring in the middle of the night during inclement weather conditions.

The woman's age and health status

If a woman is planning a delivery on the mission field and is classified as "high risk," she should not stay unless she is in a location where high risk obstetrics is available. A high risk pregnancy includes a woman over 35, especially if she is in her first pregnancy, and any woman with a chronic disease. Certain illnesses greatly increase the chances of complications in pregnancy. A woman considering being pregnant on the mission field should obtain expert consultation if they have any of the illnesses listed below.

Diabetes mellitus (including diet controlled)
hypertension
seizure disorder
moderate or severe asthma
sickle cell anemia
Blood clotting disorder
ulcerative colitis or Crohn's disease

arthritis that requires daily medication
history of deep venous thrombosis or pulmonary embolism
chronic kidney disease (glomerulonephritis)
recurrent urinary tract infections or history of pyelonephritis
neurological disorders (e.g., multiple sclerosis, myasthenia gravis)
adrenal problems (e.g., Addison's Disease, Cushing's Disease)
autoimmune disorders (e.g., systemic lupus erythematous, sarcoidosis, etc.)
immunodeficiency disorders
history of a miscarriage, especially if recurrent
history of postpartum hemorrhage requiring blood transfusion
multiple gestation (twins or triplets, etc.)
morbid obesity (over twice the recommended weight for height)

Any woman with a chronic disease such as those listed who becomes pregnant should arrange for immediate consultation, preferably with a high risk obstetrician.

Unfortunately, the first time a woman is pregnant, she is at risk for a number of problems that she could have with each succeeding pregnancy. A woman may have a pelvis that is too small to deliver a normal sized infant, and require caesarian section to save her life and the baby's life. She may have premature deliveries, with the baby coming too early to survive without neonatal intensive care that might include putting the baby on a respirator or giving it all its nutrition through umbilical artery catheters for some weeks. The primigravid (first time pregnant woman) may develop toxemia or preeclampsia, pregnancy induced hypertension, or pregnancy induced diabetes. An ordinary urine infection may turn into a life-threatening pyelonephritis (kidney infection requiring hospitalization and IV antibiotics to save the woman's life). These are only a few of the considerations.

To ensure a safer outcome for the pregnant patient and the fetus, certain tests are now routinely done for pregnant ladies in the USA. that may not be available in remote environments. These tests include things such as ultrasound, and blood tests such as alpha-fetoprotein (AFP), beta human chorionic gonadotropin, glucose tolerance test (done between the 24th and 28th week to screen for pregnancy induced diabetes), blood and Rh type, antibody screening done in case blood is required at delivery, hemoglobin and hematocrit, and screening cultures for group B streptococcus, herpes or other diseases that can affect the newborn. These tests might not even be available in the best medical centers in some countries.

A good reference book for the couple planning pregnancy in a remote environment is *Where There Is No Doctor,* which discusses some of the health considerations for a pregnant woman who will be in a remote area.

What is available locally?

Some countries have trained midwives and very good obstetricians, some of whom may have even trained in the USA. If you are trying to decide whether to stay or go home, go and visit with the facilities in close proximity that can take care of obstetrical problems. Even medical doctors have difficulty in evaluating another medical doctor unless they can read his charts and watch him practice. Since this may be impossible for a foreigner to do, you can look at the cleanliness of the facility, talk to numerous nurses and other medical people who may have some knowledge of the practitioner's abilities, ask about his credentials and see if his training was from a reputable place, and even call one of the practitioner's mentors for a reference.

Does the facility practice sterile technique? Do they have a lab facility? What are the reference controls for the lab? Can they give a safe blood transfusion? Do they know how many women died in childbirth at their facility in the last year and what were the causes? Who covers for the doctor at night and how easy is it to get in touch with him and get him to come in for an emergency? Can they do a safe c-section? If they do not do c-sections, what is the procedure for transferring a woman in labor who needs a c-section and where do they send her? What is their procedure for resuscitating a newborn? Is there oxygen available? Are there emergency drugs available like adrenaline, oxytocin, ergotamine, sterile IV fluids as normal saline or lactated ringers (also known as Hartman's solution), a blood bank? Is there an emergency lab technician available for cross matching the blood or doing other emergency lab? What type of anesthesia is available? Is there a high risk nursery or neonatal intensive care facility nearby? Where did the neonatologist do their training? Are there restrictions on who is allowed to get their services? How is payment made for services rendered?

Generally, it is best to make up the worst case scenario for the pregnant woman on the mission field, and then find out what is available if this occurred and have a plan to cover all potential problems. If potential problems cannot be adequately handled in a reasonably prudent manner by USA standards, strong considerations should be given to the pregnant female returning for her delivery (see section "When is the best time to return?")

Prenatal Considerations

If a woman is going to be in a remote environment, before she goes she should be sure all immunizations are updated. These should include rubella, diphtheria-tetanus, yellow fever if she is to be in a yellow fever area, typhoid fever vaccine, hepatitis A and hepatitis B vaccine, chickenpox vaccine if she has not had chickenpox as a child, and other vaccines that may be indicated for the area. If a woman is going to be in a malarious zone, malaria

prophylactics should be taken. Much of the malaria is resistant to Chloroquine. Chloroquine has been found to be fairly safe to use during pregnancy. Recently studies have been done with Larium and it is felt to be safe in the second half of pregnancy. It would be recommended that any woman who would be residing in malarious areas consult with an obstetrician or a doctor who has had experience in the malarious area about what precautions to take to prevent malaria and any medications that should be taken to try to prevent it.

Recommended for the woman who is pregnant, is a routine exam when she finds that she is first pregnant that includes a Pap smear, complete blood count, urinalysis, blood typing with Rh type (Rh negative women should receive RhoGAM in an appropriate dose for any spontaneous abortion, abdominal trauma, any second or third trimester bleeding, at 28 weeks gestation, and postpartum within 72 hours if the baby is RH positive or the RH cannot be determined or they may develop sensitization to the fetal blood, greatly complicating any future pregnancy), and an antibody screen (indirect Coombs' test), test for syphilis, and if there is any question, testing for sickle cell disease or any possible infection of the female genital tract that might be present including herpes, chlamydia or trichomoniasis. Other laboratory investigations that are recommended would be serum alpha-fetoprotein at 15 weeks, blood glucose screen with 50 grams of oral glucose at 24 weeks with group B strep screen done also at 24 weeks and hematocrit done at 28-32 weeks. She should be tested to be sure she is immune to rubella and to be sure she is not a hepatitis B carrier. A PPD TB skin test is recommended.

Nutrition is important in pregnancy. The prenatal care and exam should review nutrition. Expected weight gain is an average of 25 pounds plus or minus 5 pounds. This usually is 2-5 pounds total during the first trimester and an average of 3/4-1 pound per week thereafter. To meet the nutritional demands of pregnancy, vitamins are needed. Although a good prenatal vitamin is obtainable over the counter in the USA which will meet these demands, in many countries a prenatal vitamin is not available. Depending on the country one is going to, a good supply of prenatal vitamins may need to be brought along. Women who are even considering pregnancy are advised to take folic acid supplements daily to try to prevent neural tube defects in the amount of 1 mg per day. Nutrition during pregnancy should include at least 1200 mg of elemental calcium per day and at least 30 mg of iron per day in addition to 1 mg of folic acid per day. These are all obtainable by taking a prenatal vitamin once daily. In addition, she should be sure to eat plenty of green leafy vegetables, broccoli and red meat. An adequate fluid intake in the amount of 2 quarts of water per day (or more in hot environments) is also recommended. Iodized salt is recommended. Alcohol

should be completely avoided during pregnancy because of the increased risk of mid-trimester abortion, mental retardation and behavior and learning disorders in children born to mothers who have used alcohol during pregnancy. Tobacco should be totally avoided because of its increased risk of low birth weight infants, premature labor, miscarriages, stillbirth and birth defects, much greater incidence of upper respiratory infection in the smoking woman and in the children that live in the house with a smoking parent. Seat belts that do not directly cross the gravid uterus should be worn when riding in a motor vehicle. No medication, with the exception of acetaminophen (Tylenol) and prenatal vitamins, should be used without checking with a physician. The pregnant woman should try to avoid children with viral illnesses and direct contact with cat litter or raw meats to minimize contact with Toxoplasmosis.

Prenatal care includes periodic monitoring of the woman and the fetus. It is advisable for the woman, even when there is no skilled person around to follow their pregnancy, to do routine weighing, taking of her blood pressure which can be taught to her by a nurse or can be done with an automatic machine, and routine measurements of the growth of the uterus which is commonly done with a tape measure measuring from the top of the uterus down to the top of the pelvic bone that is felt several inches below the umbilicus.

One of the reasons for development of ultrasonic imaging was the desire to find a safer means of imaging the fetus other than x-rays. Ultrasound is commonly obtained on pregnant women in the USA to help confirm dates and screen for fetal disorders, such as polyhydramnios, a condition characterized by an excessive amount of amniotic fluid often associated with other abnormalities of the fetus such as lack of brain or an undeveloped gastrointestinal tract, abnormalities of the kidneys, limbs, spinal cord, heart and other major organs. It also helps to confirm a suspected multiple pregnancy. Ultrasound is recommended between 12 and 20 weeks gestation if it is available in your area.

Women who are 35 or older and at increased risk for children with defects such as Down's syndrome commonly obtain amniocentesis at 16-18 weeks gestation to try to help identify these conditions. If a disorder is found, it does not mean that the woman has to have an abortion but it may help her to prepare for what is to come and sometimes there are things that can be done before the child is born that may help to reverse the disorder, such as closure of a ruptured diaphragm or blood transfusion or medicine given to the fetus in utero, etc.

Danger Signals in Pregnancy

Signs of serious pregnancy related illnesses for which emergency medical help should be sought include the following:

1. Bleeding.
2. Severe abdominal pain.
3. Premature labor.
4. Hypertension (home blood pressure cuff should be carried by pregnant woman traveling to remote places).
5. Proteinuria (urine dip sticks for urine sugar and protein should be carried by pregnant woman traveling to remote places).
6. Severe headaches or visual complaints.
7. Severe edema or accelerated weight gain.
8. Suspected rupture of membranes.
9. Fever over 100.4^0.

Morning sickness is commonly seen in pregnancy but a pregnant woman with persistent nausea and vomiting may develop metabolic disturbances dangerous to the fetus. This problem is more likely to occur with multiple gestations or a molar pregnancy (hydatidiform mole tumor growing in the uterus that simulates pregnancy, but is not a baby). A woman with severe nausea should avoid all medication when possible, but diphenhydramine (Benadryl) in a dose of 25 mg every six hours with Unisom (doxylamine succinate) 25 mg, ½ - 1 twice a day may be of some benefit. Also electrolyte solutions such as Kao-Lyte (made by makers of Kaopectate) are good to take. Keeping soda crackers at the bedside and eating before rising and admitting iron supplements until nausea resolves may also be of benefit.

Hypertension in pregnancy is present when the blood pressure diastolic (bottom number) is 90 or greater or the systolic (upper number) is 140 or greater. Risk factors for pregnancy induced hypertension include first pregnancy, multiple gestation, a positive family history of pregnancy induced hypertension, and abnormal conditions such as polyhydramnios or hydatidiform mole.

Preeclampsia is defined as the presence of hypertension accompanied by protein in the urine, edema or both. Criteria for mild preeclampsia include hypertension as defined above plus protein of 2+ or more on a urine dip stick or 300 mg every 24 hours or greater. Mild edema is usually signaled by a weight gain of more than 2 pounds per week or 6 pounds in a month. Severe preeclampsia is defined as a blood pressure being greater than 160/110 or a rise of 16 mm Hg of the systolic blood pressure over the base line with protein more than 5 GM/24-hours (3+ or 4+ on a urine dip stick) and massive edema.

Eclampsia occurs when a seizure occurs. A development of any of these danger signs requires that the woman seek immediate medical care.

The treatment of preeclampsia may prevent its progression to eclampsia. If treatment does not work, labor is induced to prevent the progression to eclampsia. Magnesium Sulfate IV or IM is usually given as part of the treatment and the ability to monitor magnesium levels in the lab may be useful.

Travel During Pregnancy. When Is the Best Time to Return?

If a woman has no complications, she can travel at any time during her pregnancy. There are no medical reasons that would make it unsafe to travel during the last four weeks of pregnancy, but it is recommended that travel be limited to travel that is absolutely necessary to avoid delivery in a strange place. One never knows when the membranes may spontaneously rupture or when labor may begin. Domestic airlines stipulate that no travel of greater than 36 weeks gestation is allowed and many foreign airlines have a cut off of 35 weeks gestation. In addition, a note signed by the patient's physician specifying the expected date of confinement is often required to travel on an airline if a woman is obviously pregnant. In a remote area, it is very good to have a contingency plan should an emergency occur about where and how the pregnant woman would be transferred. Travel to areas of altitudes greater than 5000-6000 feet, unless one has been at this altitude throughout the pregnancy, is not recommended because of oxygen desaturation and its effect on the fetus and potential for altitude sickness in the mother to be. Travel destinations should be chosen as sensibly as possible, trying to avoid prolonged travel over rough terrain, long periods of travel where a woman may develop blood clots in her legs or not have easy access to toilet facilities. The pregnant woman traveler should also be very careful of the food she takes that has been prepared by others, trying to avoid a food borne intestinal infection from poorly prepared food or a food handler with a contagious disease who uses poor hygiene.

The Last Trimester

It is recommended that the pregnant woman be seen every two weeks during the first part of the last trimester and every week during the last month by the doctor/medical attendant to assess for any problems that may be developing. The doctor pays close attention to the woman's weight gain, her blood pressure and the growth of the baby. In a remote environment where this is not available, the woman should have her partner or somebody performing this function. If the blood pressure goes up over 140 mm Hg systolic (the top number) or 90 mm diastolic (the bottom number), if there is

failure of the uterus and baby to grow, or if fetal movement stops, then expert medical attention should be obtained immediately. The doctor also tries to determine the lie of the infant since breech deliveries, where the baby's bottom comes out first, are at much higher risk for fetal death. In breech delivery, the head often times may be caught in the birth canal after the rest of the baby is out, and the baby may suffocate before it can be delivered safely. The last trimester of pregnancy is when diseases such as preeclampsia or eclampsia are most likely to develop. This is why weight gain is monitored and should be an average of 1 pound per week during this time. Anything over 2 pounds per week with the other symptoms of hypertension or protein in the urine should cause alarm in the pregnant woman in a remote place. If there is a suspicion of poor growth of the baby or preeclampsia, bed rest may be beneficial, in the left lateral decubitus position (left side down). There are no routine restrictions on sexual relations during this time other than a comfortable position but caution should be used if there is any history of previous premature deliveries or incompetent cervix. Group B strep which can progress rapidly causing lung disease is often screened for during this time by obtaining a culture from the vaginal wall with a cotton tip applicator from a culturette tube. This would need to be done in a medical setting. Any woman with a history of Group B strep would not want to have a pregnancy in a remote environment since the risks for recurrence and loss of her baby would be quite high.

Also, during the last trimester, non-stress testing or stress testing may be indicated. These are tests that help assure the doctor and the parents that the baby is doing fine and can continue to live in the womb for at least a few more days. These tests are done when any of the following conditions are present: high blood pressure, diabetes, multiple gestations, suspected intrauterine growth retardation (baby in the uterus not growing as suspected), nonplacental abnormality, maternal heart or renal disease, history of hemoglobinopathy (such as sickle cell disease), a pregnancy that has gone past its date, or unexplained loss of fetal movement.

Home Delivery Without Help

Due to the number of complications that can occur this is not recommended. However, in a woman who has had previously normal babies and who has access to someone who has previous experience, the following guidelines might be helpful. The medical attendant responsible for the delivery should have a good reference manual that they are thoroughly familiar with regarding the normal conduct of labor and delivery and that discusses what can be done for complications. They should also have an emergency plan that has been discussed with the patient should problems arise.

First of all, an area should be selected for delivery of the baby where the

room will have a comfortable temperature and where there is adequate access to sterile water, and a lot of very clean or sterile cloths. A sterile needle and syringe for injecting a medicine to cause the uterus to contract is needed (3 cc syringe with 23 gauge needle). Equipment to record vital signs such as blood pressure and pulse should be present and adequate tools for cutting the umbilical cord sterilely (brand new razor blade or rust free scissors that have been boiled in water for 20 minutes, sterile gauze for covering the navel, antiseptic solution for painting the cord area, antiseptic soap for washing hands and alcohol to rinse hands after washing them, clean cotton, two sterile ribbons or cloths to tie the cord) and for resuscitating the infant such as a resuscitation bulb to clean the nose and suction the infant. A fetoscope or stethoscope for listening to the baby's heart, several injections of ergonovine or ergometrine for helping the uterus to contract after delivery, clean bowl for catching the afterbirth, sterile needles and thread for sewing tears in the birth opening, and 2 hemostats and a needle holder for clamping bleeding veins and holding needle are needed. Silver nitrate drops or tetracycline ointment for the baby's eyes is needed. At the time of labor an inspection should be done of the perineal area looking for cold sore like lesions (possibly herpes), viral warts, or other infections. The perineum is normally shaved and washed well with a sterile soap and sterile water. Identification should be made of the presenting part which should be a head. If it is a foot, buttock, or other then the patient should be transferred as soon as possible to a medical center with adequate obstetrical care, including the ability to do caesarian sections. The baby's heart rate should be monitored during labor. The normal heart beat of a fetus is 120-160 beats per minute. If the heart rate is going down to 120 beats per minute and persisting after the woman's contraction is gone this may be a sign of fetal distress and expert medical care should be sought.

If there are any problems during labor such as meconium staining of the amniotic fluid (greenish stain to the amniotic fluid from passage of meconium by the infant in utero), development of fever in the mother, development of shock (low blood pressure and lack of urine production with a rapid pulse and pale skin), or seizure, the woman should be transferred to an adequate medical facility. If it is suspected that the infant is growth retarded, or the woman has known medical complications such as hypertension, diabetes, anemia, heart disease, or kidney disease, she should not attempt delivery at home. If there is failure to progress through labor in a normal timely fashion (normal labor is less than 12 hours and causes progressive dilation and thinning of the cervix along with moving the baby down), or the woman becomes fully dilated and has not delivered the baby in less than one hour, or if the membranes are ruptured and the labor has not started within a few hours, the woman should not attempt delivery at home.

In the conduct of a normal spontaneous vaginal delivery, control of the head so that there is no forcible sudden expulsion which may produce injury to the mother or baby is the goal. As the baby's head begins to appear beneath the symphysis bone, the woman's perineum is supported by direct pressure from a draped hand over the area and the head is delivered. At this time, the baby should be checked for the presence of the umbilical cord about the neck. If it is present, it should be gently slipped over the infant's head and if this cannot be accomplished, double clamped and cut between the two clamps, prior to completing the delivery. The mouth and nose should be cleared of secretions with the bulb syringe at this time. Delivery of the shoulders is next accomplished. With a gentle traction on the head and body, bring the anterior of the shoulder beneath the symphysis bone. Care must be taken to control the delivery of the body to prevent unnecessary injury. Immediate care of the infant includes double clamping and cutting the umbilical cord and clearing the airway and assuring that body temperature is maintained by drying and wrapping or placing next to a heat source such as heated water bottles.

Home delivery can be dangerous because of unforeseen maternal complications such as placenta praevia where the placenta is in front of the baby's head and the woman hemorrhages to death, or placentae abruption where the placenta separates from the uterus prematurely killing the infant and causing dangerous hemorrhaging to the woman, or fetal distress requiring emergency c-section, or shoulder dystocia where the shoulder is too large and the baby gets hung up with inability to deliver unless the shoulder is broken or some other maneuver is accomplished which would help the baby to deliver but may cause injury to the mother.

There also can be complications to the infant that would require emergency resuscitation, equipment that might not be available such as oxygen or material to intubate the infant.

When Is a Doctor Mandatory?

Difficulties in childbirth do occur, and sometimes the life of the mother or child may be in danger. If there is any reason to think that a birth may be difficult or dangerous, an experienced doctor should be present. A doctor is mandatory for delivery if the woman has any of the following conditions:

1. Begins to bleed before labor.
2. Signs of toxemia of pregnancy (see above - includes high blood pressure, edema and protein in the urine).
3. Febrile illness.
4. Anemic or her blood does not clot normally.
5. Looks like she will have twins.
6. The baby is not in the normal position in the womb with the head

coming first (that is if a foot or hand or bottom is coming out first).

7. The bag of water has broken and labor has not begun within a few hours (especially important if there is fever).
8. Severe headache or visual complaints.
9. Severe abdominal pain not associated with normal contractions.
10. Shock with low blood pressure.
11. Labor is premature and the baby is expected to be less than 37 weeks gestation (normal 40 weeks).
12. Suspected rupture of the uterus.
13. Meconium that comes out when the membrane is ruptured (dark green material instead of clear water).
14. The umbilical cord descends into the birth canal in front of the presenting part (cord prolapse).
15. The cervix is not dilating normally and labor is persisting more than 12 hours (or 18 hours if first pregnancy).
16. Any serious illness, such as diabetes or heart trouble, or one of the conditions listed as high risk (see previous section).
17. Is under 15 or over 40, or over 35 and her first pregnancy.
18. Is especially short or has narrow hips.
19. Hernia.

Obstetrical Emergencies

There are a number of obstetrical emergencies that can arise. Many of these have been mentioned above.

The first one is fetal distress. This may have been predicted by meconium staining of the amniotic fluid prior to the delivery of the infant. Fetal distress may be indicated if the fetal heart rate is going down to very low levels (below 120) when no contraction is occurring. If the baby is not delivered soon, he is at risk for dying. Even if he is delivered, he could require special equipment such as a respirator to get him through the first few days, especially if he aspirated any meconium during delivery.

Another obstetric emergency occurs when the woman has fever, especially if the water draining from the womb is cloudy or has a foul smell. Both the baby and the woman are at risk for death if this is not handled appropriately. Both may require antibiotics in order to safely come through this.

Shoulder dystocia where the shoulder is too big for delivery was mentioned previously. Management of this usually includes an adequate general episiotomy, and attempting McRobert's maneuver where the mother's thighs are hyper flexed, bring her feet to her ears, and have assistant applied supra pubic pressure causing the shoulder to move under the symphysis pubis. Delivery should be attempted with general downward traction. Another

maneuver is to try to deliver the posterior arm first and rotate the anterior shoulder into the oblique position for delivery. If all else fails, one may attempt deliberate fracture of the clavicle of the impacted shoulder by using the thumb and forefinger to push the clavicle outward to avoid a pneumothorax. Damage to the cervical nerves may occur and cause permanent sequelae but this risk may have to be taken in order to avoid the infant dying.

Fetal distress, cord prolapse and fetal malpresentation often require emergency cesarean section. Placenta praevia, where the placenta is in front of the presenting parts, or abruption placenta where the placenta is separated usually requires emergency c-section. These things cannot always be adequately predicted and are complications that can result not only in death of the infant but also the mother if not adequately handled.

Sometimes after a woman delivers her baby, the placenta may not come out, or only part of the placenta will come out. This is usually accompanied by profuse bleeding. During this time, the baby should be put to the woman's breasts and if possible oxytocin should be given. The womb should be massaged and an attempt made to put gentle traction on the placenta to pull it out. If the woman has lost a great deal of blood, medical help should be sought as soon as possible as a blood transfusion may be needed.

Do You Consult or Use a Native Midwife?

Because midwives have varied degrees of experience and sometimes keep laboring patients who are in trouble longer than they should be kept, sometimes to the point that the baby has died in utero before transfer, one should have a very good knowledge of the native midwife before using her services. While working in Nigeria in the early 1980s, the author had opportunity to observe one of the best midwives at the Nigerian Christian Hospital who also ran a maternity home in her community that had an excellent reputation. She did an excellent job and had adequate emergency plans for her patients. However, she was the exception, and most of the others I had contact with often would not send their problem patients to us until it was too late, resulting in death of the mother and infant on some occasions.

Information on how competent a midwife is can be difficult to obtain. Even medical doctors have trouble evaluating their skills, unless the physician has opportunity to work side by side with the midwife in deliveries over a period of time. It is recommended that one consult with the hospitals that the midwife refers to and also talk to any physicians in the area who have observed her. If there are any questions, it is better to consult with a trusted doctor. Sometimes a couple is better off to make plans for the woman to stay with a relative, friend or even in a hotel in a city where there is adequate medical care and there is a trusted medical establishment if there is any

question about there being a skilled midwife available. Some native midwives may have had contact with good doctors or other American doctors and come from well-trained institutions. They may be skilled at recognizing important danger signals and have good connections for emergency referrals. Their abilities may be much greater than what would be available at home. Other midwives could be dangerous enough to cause death to both the fetus and the mother. A native midwife should have not only good recommendations from natives whom she of has delivered but also from people who are known to be knowledgeable in the area of obstetrics.

Care of a Newborn Infant

Immediately after delivery, the woman should be put to bed and should have her vital signs checked every 15 minutes for one hour and nothing to eat for 1-2 hours after. An ice pack to the perineum may help the swelling. Thereafter, she can ambulate and eat a general diet as tolerated. Sitz baths (sitting in a few inches of warm sterile water) are recommended three times daily. The mother may begin nursing as soon as she wishes and this is preferable to bottle feeding. Her medicine should include vitamins such as prenatal vitamins with iron the whole time she is nursing the baby or at least for several months after the delivery, especially if she is anemic. She can safely take Extra Strength Tylenol or even ibuprofen for cramping and pain afterwards. Her bowels may be somewhat constipated and a stool softener such as docusate sodium 100 mg orally twice daily or Milk of Magnesia 30 ml per day may help soften her stools.

Postpartum hemorrhage is defined as more than 500 cc of blood loss in the first 24-hours which may complicate a spontaneous vaginal delivery. Clinical experience is often necessary to determine when bleeding is occurring too rapidly. This is more likely to occur if a woman has had more than five babies, or has a history of previous postpartum hemorrhage, or required manual removal of the placenta, or had a placenta abruption or placenta praevia, or prolonged labor or a difficult delivery. If this is suspected, blood pressure and pulse should be monitored frequently (every 15 minutes). The uterus should be palpated for atrophy and tenderness. Examination should be made carefully of the vaginal area for any laceration and if this is found, this should be sutured or have pressure put on it until it can be adequately closed.

Reliable IV access must be obtained when the patient shows evidence of shock (no urine output, low blood pressure, high pulse). IV fluids such as normal saline or lactated ringers solution, not D5W (sugar water), should be started and given at a rapid rate (more than 175 cc per hour). The drug oxytocin or ergotamine should be available to give to cause the uterus to contract and stop bleeding. The uterus should be massaged by compressing

it between a hand in the vagina and one below the umbilicus. Preparation should be made to obtain blood if hemorrhage is unresponsive to this and the giving of IV fluids.

Fever greater than 38 degrees centigrade (100.4^0 Fahrenheit) in the first 24-hours or greater than 38 degrees for two consecutive days after delivery is diagnosed as puerperal fever. This can be due to an infection in the womb, an abscess in the pelvic area, a kidney infection, blood clots developing in the pelvis or in the legs, a breast infection, or a respiratory infection. Medical care should be obtained because antibiotics may be needed in order to adequately care for the mother.

It is recommended that an Apgar score which consists of five factors (heart rate, respiratory effort, muscle tone, responsiveness, and color) be accomplished at one minute and again at five minutes after delivery. If the second scoring at five minutes is below five, immediate medical assistance for the infant may be needed. Newborn infants should be regarded as recovering patients and kept under close observation during the first few hours after birth. A specific person should be responsible for watching the infant. After the baby is born, it should be placed in a pre-warmed place. A stethoscope should be used to obtain heart rate and check for breath sounds. The umbilical cord, after having been cut sterilely, is best painted with an antiseptic solution such as gentian violet solution and alcohol in order to help prevent any infection. Also, vitamin K is commonly given to help prevent any hemorrhage. A low birth weight infant is at increased risk for developing problems with his temperature, low blood sugar, breathing and pulmonary problems. Any infant below 2500 GM should be transferred to a medical environment where he can receive proper care.

It is important for the newborn to be kept in an environment where he will not become chilled or over heated. After birth, the infant's core temperature drops rapidly and may result in a lower arterial oxygen level and even low blood sugar. Infants who are cold may feed poorly and are lethargic. High environmental temperature may cause problems also. The best way to monitor temperature is with a rectal thermometer. A single measurement is of little value. Normally it is best to maintain the temperature between 36.5 and 37 degrees rectally. Any temperature greater than 38 degrees should raise the suspicion of possible infection, dehydration or too high of an environmental temperature.

The appearance of the infant should be noted, specifically the color. The skin often becomes reddish for a few hours after birth and then fades to a normal appearance. The presence of yellow jaundice should be noted. Blueness of the fingers and feet is commonly present if the extremities are cool right after birth but generalized cyanosis or blueness is an important observation

that requires immediate medical attention. If the infant is very pale, it may indicate a serious anemia which must be confirmed. Meconium staining of the umbilical cord or nails may suggest prior fetal distress. Sometimes lesions such as bluish-black areas of pigmentation known as Mongolian spots or capillary hemangiomas which are reddish type moles over the eyelids, the forehead or lips may be seen. The general shape and symmetry of the head should be noted and the fontanelles should be examined. The face, eyes, nose, ears, and neck should be noted. The character of the cry should be noted. Expiratory grunting, a weak cry or a high-pitched cry requires examination of the infant. The lungs should be listened to with a stethoscope and should show good breath sounds in both lungs. Decreased breath sounds on one side and grunting or wet sounding lungs with lots of crackles may indicate serious abnormalities and require immediate attention.

The abdomen should be looked at and should be slightly protuberant as the bowels fill with air. Any hernia or severe abdominal extension requires medical evaluation. Examination should be made of the genitalia, anus and rectum. Note should be made that the infant is able to urinate and pass meconium. The extremities should be examined and arms and legs should be relatively symmetrical. It is good to have the infant's hips examined by someone who is skilled in doing this at the earliest convenience. Also a general neurological evaluation should be done consisting of noticing the muscle tone and if the patient has an adequate suck reflex by placing the finger in the mouth and noting the vigor of the sucking. If the baby is very floppy and has a poor suck, immediate medical evaluation is indicated. The infant should also have a good startle reflex that may even be followed by a cry. This can be elicited by holding the baby's hand, lifting his body and neck but not his head off the examining table and quickly letting go or holding the infant in both hands and lowering both hands rapidly a few centimeters so he experiences a sensation of falling.

As mentioned after delivery, certain routines must be performed: general suctioning with a bulb syringe of the nose and mouth, Apgar scoring determined at one and five minutes, general physical examination, administrating of vitamin K 1 mg i.m. is recommended and noting the first urine and stool. He may be given his first feeding anywhere from 3-12 hours after birth. Feeding schedules may vary and demand feeding which is allowing the baby to eat when he is awake and hungry usually leads to optimal intake and eventual establishment of a schedule which will satisfy the baby. Although formula feeding may be used, the breast is best. Successful breast feeding is related to the amount of information the mother has on breast feeding and her emotional support. If bottle feeding is to be done it is important that the nipple hole be enlarged and that water feeding be offered first to be sure that there is

no problem with the swallowing or handling of the fluids. Following this, a commercialized formula can be given.

A number of respiratory diseases may be manifested by the symptom complex of expiratory grunting and extractions of the chest wall with varying degrees of cyanosis and increased respiratory rate. If these symptoms begin to occur, immediate medical attention should be sought. This may be due from cold stress but also could be due from pneumonia, collapse of a lung at delivery, hemorrhaging into the lung, diaphragmatic hernia, hemorrhage into the brain, or even a congenital heart problem. Signs and symptoms of heart disease in the newborn may be difficult to recognize. Significant congenital heart disease is manifested by general cyanosis and is not difficult to recognize.

The most frequent problem in the newborn is jaundice or yellow skin. The degree of jaundice that develops depends upon a number of factors including red cell breakdown, immaturity and weight of the infant and in the amount of bile reabsorbed from the intestines. An infant that develops yellow jaundice probably needs blood determination of the level of jaundice to prevent a special danger when the bilirubin is too high that can cause brain damage. Jaundice in a newborn can occur from a mismatch between the blood in the mother's blood, bacterial infections, inherited disorders of the red blood cells, from hemorrhage within the body, liver infections, or liver abnormalities. Often when a newborn gets an infection, the only symptoms may be poor color, irritability, poor feeding with a poor suck, and sometimes fever. These symptoms in an infant less than six weeks old should be rapidly evaluated by a trained practitioner as anything from meningitis to a mild cold could be present.

Certain immunizations are recommended immediately after birth which include hepatitis B and in some countries BCG vaccine which is thought to help prevent tuberculosis. Most routine immunizations do not start until six weeks to two months. Mothers in remote countries should be familiar with the recommendations for immunizations and make arrangements for their children to get these at early ages. Also, consideration should be given to protecting the child from any other environmental threats such as mosquitoes which can carry fever, malaria and other problems and in protecting them from flies and animals which carry a number of diseases.

Well-child visits are recommended as early as two weeks after birth to assess the growth and development and then at six weeks to two months. An infant should gain around an ounce a day during the first few months of life and it is important for the weight and the head circumference to be followed and assessments made of the vision, hearing and examination for any possible congenital abnormalities.

Summary

Having a baby on the mission field can be a dangerous undertaking, but some missionaries will have access to proper medical care. The couple should be aware of the potential problems surrounding pregnancy, labor and delivery that can arise in the mission field and talk with their physicians in the USA if there is any concern about what should be done. Preparation and knowledge of what to do in emergencies is invaluable.

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IT'S ABOUT HEALING THE BODY...

Chapter 13

Experiences in a Backyard Clinic

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I miss my years in Nigeria tremendously. I miss being able to help the people. Using what little I had to help and teach was a marvelous experience for me and I hope it showed God's glory. That is what it was for. As far as feeling like you have purpose in your life, there is nothing like it than having an experience like this. Comparing it to my work in the states is hard to describe—it is like having a hole missing. I work hard and I care for my patients and I want to do for them the best I can, but there are so many laws and stipulations, so much paper work, that I feel I cannot do as good a work as I could do in Africa. And the opportunity that I had there to teach people and to help people, helped me grow tremendously and I hope in some way I helped those people. I do not want anything that I say to appear that I put those people down in any way. We were able to help them and I was happy I was able to do that.

In preparation for this chapter, Lisa Carter and I sat down and reminisced about our experiences in Africa. Some of these stories are Lisa's but they are all true life stories that happened while we were over there.

One day on my front porch, an old woman appeared – obviously a grandmother. She had a newborn with her. She was very flat breasted but the baby was sucking on a nipple just to be pacified. The mother had died and she didn't know what to do to keep the baby alive. We gave her dried milk and showed her how to prepare it for the baby. At first, we gave her a large amount, but she would use it all up too fast. Then we started having her come back every week for that week's supply. Then the grandmother stopped taking care of it and a nine-year-old aunt took over. When I saw the baby, it was dehydrated, and malnourished, nothing but skin and bones. The eyes were sunken with no tears. We helped as much as we could and the baby would get better. Then the baby would end up in the hospital malnourished. We would get the baby healthy and they would take it home, only to not be feed properly and end up sick again. We found out that the grandmother had sold the nine-year-old aunt as a house keeper. The missionaries on the compound brought her back and put her in a house with the baby. Somewhere the aunt had access to a television and she stopped taking care of the baby. The missionaries took him in for about four months. When they went home to

Manta, near Ukpum, they started an orphanage. This child ended up being the first child in the orphanage in Manta. Now, this child is six years old and in school. Some children from the church in Florida where Lisa now attends collected money for his birthday and sent him a soccer ball and a sheet for his bed.

The main thing this story reminds us of is how very hard we tried to teach this grandmother to take care of this child and we thought all the time this child was going to die. We would go into the home and show her how to sterilize the bottles and when we went back the pot would be outside with chickens sitting on it, defecating. Or they would put in too much water to make the milk last longer and of course the baby would get sick. Over and over we tried to show how to care for the child which seemed like a never-ending battle. How that child survived was a miracle. From the empty flat breast of the grandmother to trying to teach them how to care for the child by giving them milk (which sometimes they would not even come and pick up). Lisa would go over and try to take care of the baby. It was very frustrating. Lisa even offered to try finding a home for it, but they wanted to give it to Lisa. Lisa couldn't take it because she was leaving. The real goal is to teach them to take care of their own in their own environment. Sometimes it just doesn't work out that way.

One day a woman came to my front porch who had breast cancer. I have never seen anything like it. Her breast was supported by straps that were wrapped around her neck. It was huge and the cotton material had just rotted into the breast itself and you could hardly tell the sore on her breast from where the cotton went in. It was awesome. The woman was in a lot of pain. She had started out with a lump about 4-5cm in size. She had gone to the hospital where they were going to take it out, but she lacked about $25.00 being about to pay the hospital so she didn't have it done. I didn't know her then, and by the time she came to me it was just a big ulcerated mass. There wasn't much we could do. She had gone into the village and they had given her creams and powders and different things to do for it but of course nothing had worked. By the time I saw her, it had gone too far. I sent her to the hospital and they said there was nothing that could be done except give her pain relievers, which they did. They gave her Dial soap and had her wash. I have pictures of how it had started out as a mass on the outside of her body and then later how it was a sunken hole in her chest where the whole thing just sloughed off. I can't imagine living with it and the pain she went through. She ended up so thin. If anyone wants to see reasons for not letting lumps in your breast go and not do anything about it, these pictures of this woman would definitely snap anyone into doing the right thing. She had a daughter, but she couldn't do much for her either. Once or twice a week, Lisa and I

would go in and take food and as much as possible we would help clean her. She died within six months. Lisa went to the funeral and talked about Christ's love and how He came to help the needy and that is why we had helped this lady. Later the daughter came to see Lisa and told her that her mother had come to her in a dream. She had seen her come into the room like a ghost. Her mother had told her to go see Lisa and tell her thank you for the nice things she had said at the funeral.

One time the people from the village came and got me and said something had happened to a child. Apparently he was an epileptic and had had an episode. When I arrived, he was face down in the dirt with drool coming out of his mouth. No one would touch him because they thought the same thing would happen to them if they touched him. They were also afraid of the evil spirits which they believed to be the cause. I picked him up and carried him into the house. I talked to them and tried to teach them what epilepsy was and what the seizures were about. I tried to get them to go to the doctor and get medicine to prevent this from happening again and how to take care of him.

My first patient I had when I went to Nigeria was a little girl who had osteomyelitis (an infection of the bone). This little girl had been helping someone put a heavy pan on their head. The pan fell on her, causing a compound fracture in her leg. This had happened a year before I saw her. They got someone from the military base who said they would come in and take care of her. This person took all their money, gave her one injection and never came back. The injection of course, never did anything for the leg. There was about four inches of useless bone – overlapping and grown together. We took her to the hospital where they cut off about four inches of the bone. She would have one leg shorter than the other, but it had cleared up the infection and the leg had healed. She went to rehabilitation and began school. She did not do well in school, but wanted to go to hairdressing school. I helped her get into hairdressing school and she went on her way. I don't know whatever happening to her—I hope it had a nice ending.

There was a very pretty lady that came by regularly. She had a sore on her leg that she had had for eight years and it had not been able to heal. It ended up with osteomyelitis. I sent her to the hospital where they scraped the bone and gave her antibiotics and it healed. She was so thrilled! The next baby she had she named Kathy. That was very special to me. Sometimes people would do that and then they would come and want money saying this child is named after you and you should help us. This one was different. You could tell she was so happy and even though we couldn't speak each other's language, there was a real bonding there and she knew and appreciated what had been given to her. It was a precious little girl and I have pictures of me holding her. I often wonder what she is doing now.

Another woman that came to see me walked ten miles the day after having her thirteenth baby. She came to see me because she thought the baby was breathing funny. I asked her if she would like to have her tubes tied, if her husband would agree to it. He did, so I helped her do that and then I helped her get started in a business. Her husband lived in Calabar and came home only long enough to get her pregnant. It was common practice for the husband to go off to work in the city and leave the family in the village.

When I say I helped these people I actually had the help of a group of ladies in Florida. Early on, I sent people to the hospital, but they always got the same thing, worm medicine, vitamins, and malaria medicine. I knew I could give them that without having to send them to the hospital. If they ever went for anything else, the doctors would not tell them what it was. So I was very frustrated. This was Mercy Hospital, a government hospital, that was near us. People were afraid to go to the Nigerian Christian hospital because they thought people in that state ate people. When it was really needed, and when I could, I would take them to the Nigerian Christian Hospital. But for the most part I would buy medicine and take care of people as much as I could with my own money. Finally, I wrote the ladies of the congregation where Jerry's parents attended and told them that if they would send me at least $50 a month I could do so much more. They got so excited, because they felt this was something they could do. They loved to hear me tell the stories of the people I helped, and how the money was spent. This was their own project. They almost always sent me $150 a month, which really went far. I was able to pay for operations, but more importantly I was able to stock medicines. I had a clinic that I would open during the break before chapel and after school. Otherwise people would be at my door all the time and I couldn't teach my own kids. I finally told my maid that unless they were bleeding or had a very high fever not to come and get me from school. I felt I had the responsibility of teaching my own children first and then I would take care of the clinic. I also helped with surgery at the Nigerian Christian Hospital from time to time and would teach ladies classes.

At the school, I taught biology, personal and community health classes, and sexual education to the girls. One very frustrating thing was that the kids couldn't go to school if they didn't have money to pay. The only way they knew to get the money was to "sell" themselves. If they had a rich uncle, they would sleep with him and he would pay their way to school, or buy them special clothing or anything extra. The girls knew this was the only way to get these things. If they got pregnant, they felt they would have to have an abortion because they wouldn't be able to finish school and there would be no one to take care of it.

Abortion was rampant. They would go into the bush to have it done and then get sick. I had one young girl, who went to school on the compound, that came to me and said she had malaria. Her mother was with her but I had a translator. I was about to go into the house to treat her for malaria because she had all the symptoms, headache and fever and I had no idea that it might be something else. As I went through the kitchen, my cook told me that there was a rumor that she had had an abortion, then someone else pulled me over and said the same thing. Then I noticed the whole front yard was filling up with students and I knew something was going on. I went back out and started asking more questions and sure enough the girl had gotten pregnant, had gone into the bush and had an abortion and now had an infection. I was very upset because she had lied to me and I was about to treat her for malaria which would have done no good. We got the infection cleared up and she was able to leave the hospital.

Another girl I took care of was playing soccer and broke her leg. She was one of the smartest students and I was helping support her because I saw potential in her. Her dad was a preacher at a church about an hour away. I took her to the polio clinic where the physical therapists were and they put a cast on it. They showed her how to walk with the cast. Her dad came to visit and he told me he was glad I had helped and sorry his daughter had broken her leg. He thought he needed to take her back into the village and have a bonesetter set her leg. I was trying to convince him that that wasn't needed. He said no, he thought he should take her away, have them remove the cast and have the bonesetter set the leg. I said if you take her away, don't bring her back because I am going to stop supporting her if you take her away and do that. I said that because I knew how long and drawn out it would be. He turned around and said, well, I think the cast is very good. I said thank you very much. So sure enough, she kept the cast on the normal amount of time and had no problems with it.

Sometimes we had to use psychology instead of medications. In this case, my father said I used reality therapy. We had a student who came from the Lagos area to go to school. Apparently she had been going to church where the girls got excited and had fits and seizures and this was supposed to be a religious type experience. This scared our girls and they didn't like this girl. They said she was a witch. One time one of the girls said she had left her Bible on her pillow and when she came back, the Bible was off the pillow and on the bed. She said no one was around so they knew the "witch" did it. There were stories coming out of the walls about her. They take this very seriously. We try to teach them that Jesus is stronger than this. God is stronger. To try to tell them it doesn't exist is useless because to them it does exist. I took this girl aside and talked with her, telling her how Jesus was

stronger than this. I had her look outside at the campus. I told her we didn't have demons on the campus. She was the only one who had demons and it was causing her problems. I told her that she had to get her demons out and make them leave, or we would have to make her leave. I sat down with the other girls and told them they were going to have to be Christians and be examples. I told them we had to show love for this girl and that God is stronger than Satan and they had to open their hearts up to her. After that we didn't have any more problems with her having fits and scaring all the girls.

Unless you have been there, it is hard to image some of the things you go through every day. When we lived in Nigeria, we never knew how our day was going to end. No matter how well we planned, it never ended the way you thought.

As I said before, I really got upset about the sexual promiscuity. I had one kid come up to me and tell me he had a sore on his penis. I asked him if I could see it, and he just dropped his pants. He had a large canker on it from syphilis. That was the first time I had seen that. I treated him with injections and got it healed up. But he was so innocent—no knowing where it came from or why he got it. It got me to where I really, really wanted to educate them about things like this as much as possible. They were so young and so not knowing. Sometimes mothers would use their children just to get money. And usually it wasn't that much. I saw so many kids with their lives ruined because of this. Four of us got together, myself, another missionary and two nationals and we started to teach ladies classes. We each picked a subject. Lisa picked nutrition, I picked sex education, another chose making friends and I can't remember what the other was. We talked about turning into a butterfly. I was very explicit with some of them and you could tell it affected them that I would say some of the things I said in public. I brought pictures and got better at saying what needed to be said without turning them off. I thought it was so important for them to understand what God wanted for them and what really happens with their bodies.

We had a cook on campus who was making soup and poured the hot bowl from the fire over her. She had bad burns over half of her body. She had taken yam paste and put it all over her legs and her arms where she had burned herself. She came and showed it to me, but I didn't take it off because sometimes their treatments worked better than anything we had. When she took the yam paste off, there was not a burn on her body. I have pictures of her sitting with this white stuff all over her body and when she took it off the burns were all gone. It was amazing.

One of the first patients I had was a little boy brought in by his father who said every time he drank water, the water would come out of his neck. I couldn't believe this, so I got a glass of water. When he started swallowing

the water, it started coming out of his neck. I took him to Dr. Mauricre Hood at the Nigerian Christian Hospital. I think he said it was congenital. Dr. Hood said he would try something, but didn't know if it would work. Whatever he tried worked for a while, but then it came back. I don't know whatever happened with him. We saw them for a while and then they never came around again. It was really something.

Our cook's brother worked in harvesting palm nuts. Once he was up in a tree and got off balance. He had a bamboo pole that hit an electrical line and shocked him—knocking him out of the tree. He broke his back. His relatives came to check him out and when they saw his back sticking out they started poking it, trying to push it back in. He was paralyzed but the cook didn't tell me that until after he had gone to the bonesetter. I asked our cook, how long it had been since he had urinated. The cook said he didn't think he had. It went on for about 24 hours, but they wouldn't let me see him. I finally begged them into taking me to him. We went way back in the bush. I'll never forget the little old lady with a bandana around her head and a cigar, down on her haunches over the brother. They let me talk to him, but she wouldn't tell me what she did, I think she was afraid to share her secrets with me. They had hung him upside down to try to get him to urinate but, of course, never could get it to work. The next day I finally talked them into letting me take him to the hospital where they inserted a supra pubic catheter and emptied his bladder. He already had an infection going, and got sicker and sicker. He begged to go home and I told Amos, our cook, and Etog, the driver, to take him home. They dropped him off at the house and drove off. Then you could hear the screaming. He had gone home, greeted everyone and died. I had a feeling that that is why he wanted to go home so bad—so he could die at home. I don't know what would have happened if they had taken him straight to the hospital. Could he have survived in a country like that paralyzed? Probably not.

Lisa told me about an incident that happened after I left. A woman that was having a baby was hemorrhaging. They came and got Lisa to take her to the hospital. Lisa had trouble getting a truck and then they had to put her in the truck with about three other people. They got her to the hospital and got the bleeding stopped and saved the lady's life. Later they wrote a very long letter to Lisa and ended it with thanking God that Lisa had the skill to drive. That is one of the things we impress on the people back home—you don't know what little thing that you know how to do is going to be so important. To us, you turn 16 and you learn to drive–its automatic. But you go over there and you have a skill that is so important. Lisa didn't physically save her life—she didn't stop the bleeding or do any surgery. All she did was carry her. The family recognized that and thanked God that she had the skill to

drive the car and help save the lady's life. Lisa has always held that dear.

We also worked with farm workers. Some of them came in with worms that get in your skin. You hang your clothes out on the line and then put on the clothes and get these larva under your skin. I had a worker come one time and I had to pop those things out of her buttocks. She had about 20 of them that I had to get out. I felt so sorry for her. We had a visitor that it happened to one time too. Actually, the first one I ever saw, I had to pop out of Minda's stomach. It freaked me out. It looked like a pimple and when I squeezed on it, out came a larva. It made me sick to have to do that to my own kid. Then, I had that woman come and had to pop them out of her bottom!

There is so much more that could be told. Sometimes they did things that we couldn't understand, like giving kids enemas. When a child had a fever, they would give it an enema and then the kid would dehydrate more. They would get diarrhea and then they would bring them to me half dead. Sometimes I couldn't save them. There was nothing we could do for them because those enemas were so strong and toxic. Anytime they had a fever they thought they had to give them an enema to clean them out. The enemas they used had strong herbs in them which could be really dangerous to a sick child.

One of the reasons that we started our nutrition and personal health classes while we had them at the school, was so that we could teach them some basics that they could take back with them to their village and teach others. I remember once there was a group of nurses who came in and tried to teach some villagers. They told them to wash all their vegetables and to use a toothbrush and toothpaste. I thought – wait a minute – we need to teach them at their level and where they're coming from. They aren't going to be able to get toothpaste and toothbrushes—they're going to have their chew stick. And as long as they use the chew stick their teeth were doing just fine. All the candy coming from the west was rotting their teeth out – but we did our best. I think it is a wonderful experience for nurses to go over there and get that opportunity to teach in the Third World countries. There is always something they can offer and I know they always get something from it.

I had a child whose eye had a small spot on it that had gotten infected and had to be taken out. The eye clinic did not have any children's eyeballs to place in there, all they had were adult size. When I left, they still had not replaced his eye. This was just something that happened and you just had to work with it and do the best you could.

This is some of what I can remember now. I miss it, but I felt I needed to come back to the states and raise my family. I wanted to give them the opportunity to learn their culture. Maybe they will go back and carry on the work, or work somewhere else. I'm glad we had this experience.

Editors note:

Kathy Cox, RN and her husband served for several years at the Nigerian Christian College and School at Ukpum, Nigeria. I had occasion to see some of her patients and to visit with her and I saw firsthand her dedicated care of those who came to her for help.

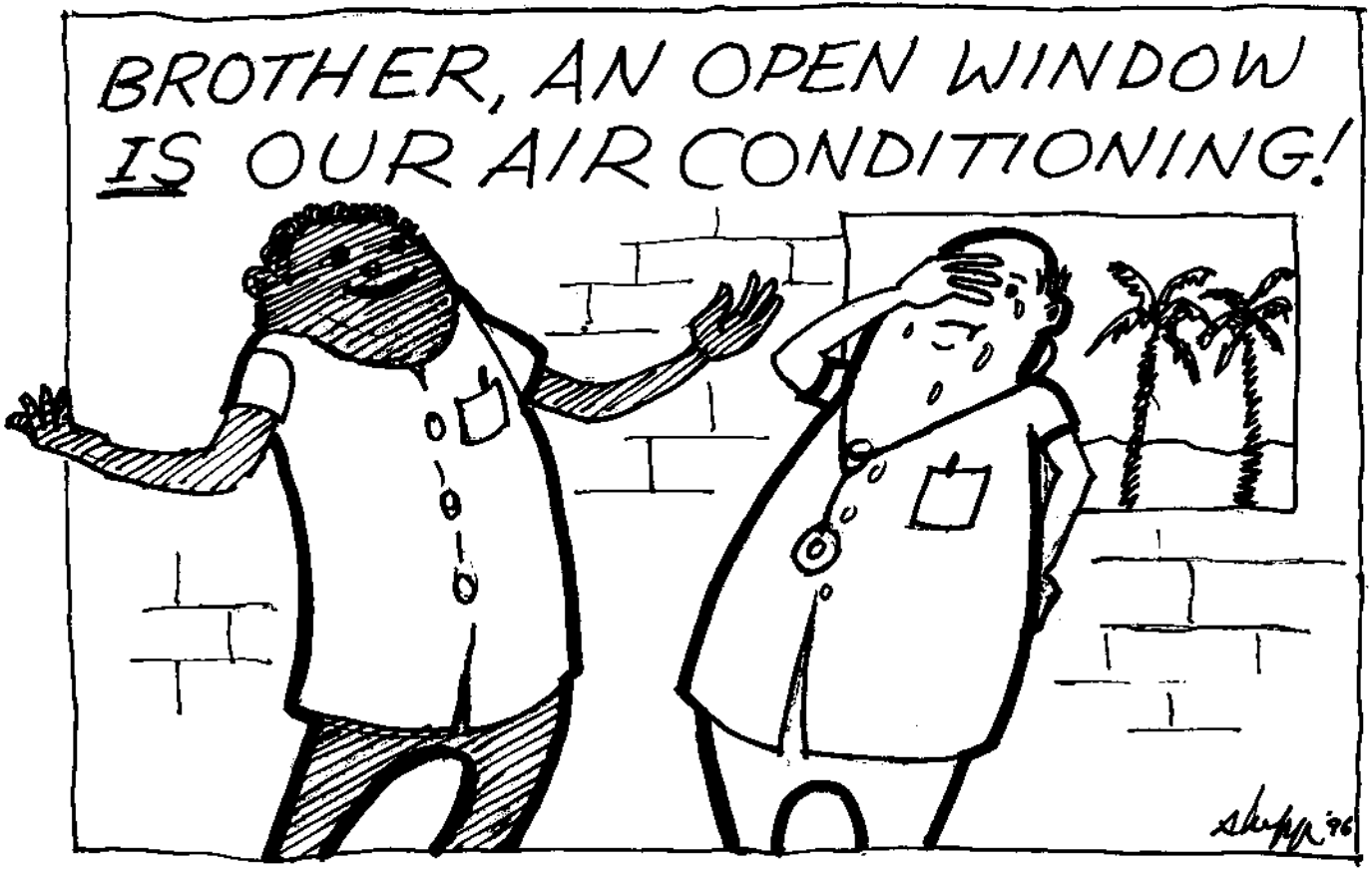
Her anecdotal experiences will give the reader some concept of the plight of so many of the people in this country. The missionary's love, care, and concern while helping those who are ill also preaches a powerful sermon which can reach the hearts of the lost.

As a nurse, Kathy could do more than most missionary wives who have little medical information. Still, much can be accomplished by treating malaria, diarrhea, dehydration, malnutrition, and tropical sores. Sometimes, just caring is a real help and at other times, furnishing hospitalization for the seriously ill may be lifesaving.

Each country has its own laws and regulations about dispensing medical care. Generally, they are very lenient, however, Muslim governments will do everything possible to interfere and make life miserable for Christians. It is best to inquire to see what is permitted and how to stay within legal boundaries. In Nigeria at present, a "work visa" is required before a wife can do anything other than keep house. To do otherwise is to risk deportation.

The backyard clinic can be a great service and satisfying experience in God's kingdom.

RMH


BROTHER, AN OPEN WINDOW
IS OUR AIR CONDITIONING!

Chapter 14

Advice for Short Term Visitors to the Tropics

Henry Farrar, MD and R. Maurice Hood, MD
Lebanon, Tennessee - Marble Falls, Texas

Persons who plan a trip of three weeks to six weeks in a tropical, underdeveloped country incur the same risks as those who plan to stay for months or years. Do not assume that because you are a healthy American that you are unlikely to become ill. For example, an exposure of one hour or less is sufficient to contract malaria if unprotected.

This section contains general, nonmedical information which is not always available unless you are traveling with experienced travelers.

Before you go:

1. Find out what immunizations are required or indicated and obtain them about six weeks before departure. Always have typhoid and tetanus updated.
2. Procure Aralen, Larium or other malaria suppressants in sufficient quantity to use two weeks ahead of travel, all of your stay and for one month after returning home.
3. Take Hepatitis B vaccine if you have not already done so.
4. Take 4 cc of immune globulin one week before departure.
5. Obtain an International Health Record booklet and fill it out accurately and be certain that the signatures are there.
6. Procure all drugs that you are taking and take an adequate supply with you.
7. This is a list of drugs and medical supplies that you should carry with you if you are traveling to a place where no medical care is available.

    Imodium tablets
    Pepto-Bismol
    An antibiotic such as Cipro 500 mg tablets #24
    Insect repellent (DEET 30%)
    Eye drops (Murine, Visine)
    Band-Aids
    Tylenol tablets
    Lomotil tablets
    20 Larium, 10 Aralen, 4 Fansidor & 18 quinine tablets (325 mg)
    1% hydrocortisone cream
    Benadryl 25 mg capsules

Triple antibiotic ointment or cream
Bottle of aqueous iodine
Antacid tablets (Tums or equivalent)
Thermometer
Several small bars of soap (hotel type)
Handi-wipes
Kleenex in small packets
Toilet paper
Enteric coated aspirin
Athletes' foot spray
Cornstarch or Baby powder
Small bottle of rubbing alcohol
Peroxide
Tincture of benzoin
Adhesive tape, scissors
Q-tips and cotton balls
Gauze and three inch elastic bandage
Six 2 cc syringes with needles
Several pair of rubber gloves

What to take:

1. Wash and wear clothing. Ironing will not be available.
2. Cotton clothing—not polyester or nylon, which are too hot to wear.
3. An extra pair of shoes that tolerate being wet.
4. Take enough clothing to last about a week. Wash day is usually only once a week.
5. Take a camera, preferably an inexpensive one. Put it in a small, airtight, plastic container with silica-gel. Take a moisture proof camera if available. The humidity will damage the electronics of the camera. Fungus will etch the front lens requiring expensive replacement or repair. Take an adequate amount of film and keep it in the refrigerator before and after exposure.
6. Writing materials.
7. Telephone numbers of friends or relatives if emergency calls are necessary.
8. An umbrella or a very lightweight poncho.

What not to take:

1. Wool suits or slacks.
2. Too much of anything.
3. Expensive cameras, tape recorders. An inexpensive small tape recorder will be useful. Expensive items make you a likely robbery victim.
4. An excess of money.
5. Rain coats. They are too hot to wear.

6. Contact lenses.
7. Postage stamps.

While in the country:

1. Drink only boiled, filtered water or bottled drinks.
2. Eat only foods that are properly prepared, exclude salad greens.
3. Stay in at night. If you must get out, wear long sleeved shirts and long pants and use insect repellent.
4. Avoid highway travel at night.
5. Sleep under mosquito netting.
6. Have all travel documents with you at all times as well as your money and anything else of value. Sometimes experienced missionaries are not good examples of good health care for any of several reasons. Do not take unnecessary risks. The price is too high.

Tiny, unseen "germs" can cause pain, suffering and even death. Do not let such thoughts stop you from the pleasure of a trip to the tropics. Taking the gospel to the Third World requires a certain amount of risk taking. Seeing such wonders such as Ngorongoro in Tanzania or Zambezi's falls are experiences worth risk taking. Don't let fear of what might happen keep you from a great trip. After all, one of the most dangerous germs in the world, Homo Drunken Driverensis, is in Monaco, Malibu, Paris, and Hometown, USA. So, *do not fear* Malaria, Salmonella, and Company. *Do* have a healthy respect for these fellows. Healthy respect for pathogens and parasites is good sense which requires some knowledge.

How do you get those bad germs?

Air borne germs, like tuberculosis, influenza and the common cold travel six feet from a person coughing or sneezing and three feet with talking. Try to keep at least six feet between you and someone who is coughing or sneezing, and three feet if a sick person is talking.

Germs in soil, like hookworm, get through your bare skin. Wear shoes in places where there are few toilets. Feces of wormy people get worm eggs in the soil. The eggs hatch to small worms that may penetrate the skin of your soles and infect you with hookworms.

Germs in water, like typhoid fever, will get you unless the water you drink is boiled and filtered and/or disinfected. Tropical hotels sometimes boil and filter water for you, but do not depend on it. For sure, don't drink tap water or brush teeth with it. Drink Coca Cola out of the bottle. Ice cubes may be made with contaminated water or glasses washed with impure water. Hot tea is safe. A Halazone tablet or 5 to 10 drops of Iodine/quart makes water safe

after 30 minutes. In places where bilharzia or guinea worm live, do not bathe or wade in the water. Those parasites are in the water and penetrate your skin.

Germs in food should be expected in: 1) dirty kitchens, 2) restaurants with dirty floors, 3) cooks with dirty aprons, 4) rare meat, 5) all raw fruits and vegetables unless you know that they have been washed in salty water. Bananas, pineapples, mangos, and papayas have wonderful skins that keep germs out. One can make grapes safe by dipping them in salty water or iodine water. Do not eat oranges that have been partially peeled by the natives, for they are usually contaminated.

Germs in insects, like malaria and encephalitis brought to you by mosquitos, means that you have to keep insects away from you. Repellents like Deep Woods Off or Cutter Outdoorsman, both with 30% DEET will repel infected mosquitos and other insects. Sleep under a mosquito net.

Germs on things (fomites) can get you if you touch a contaminated object and then put your hands in your mouth. Germs are everywhere on everything and everybody. Don't obsessively fear to touch people or things, just wash your hands and keep them away from your mouth when they have not been washed. Touching blood or serum of an AIDS victim can infect you through a minor skin cut or abrasion. Use Clorox on blood spills. Wear gloves when dealing with open sores or blood.

Malaria

Malaria is a disease afflicting millions of people in tropical countries. Malaria would not be present in America in 1998 if it were not being constantly brought into the country by infected individuals. The disease can be fatal. With just a little care there is little danger. Three things are necessary to prevent this disease:

1. Minimize the number of mosquitos by being certain that there are good screens on the windows and doors, nets over beds and repellents on the skin.
2. Take malaria suppressants.
3. Get adequate treatment rapidly if you become ill. Anopheles mosquitos are tiny. They are nocturnal and seldom seen in the daytime. Most of the danger is while you are asleep at night or if you go out at night unprotected. Always use repellents with 30% DEET. Suppression of malaria with Larium (mefloquin) or Chloroquine should be started two weeks before travel. Take 250 mg of Chloroquine once a week. Daraprim 25 mg once a week and Progaunil (paludrine) 100 mg daily are adequate substitutes in those who cannot take the other drugs. If you weigh more than 185 pounds, double the dose. Continue use of the drugs for one month after leaving.

If you get malaria which is characterized by headache, nausea, chills, fever, sweats, and abdominal pain, see a doctor – if possible. If there is no medical help available, take Chloroquine 750 mg by mouth then take 500 mg four hours later, then 250 mg three times daily for two days. Three tablets of Fansidar is usually adequate treatment. If response is not prompt or if a Chloroquine resistant strain is suspect, take quinine 650 mg three times a day for three days as indicated, but be sure to drink plenty of fluids. If there is vomiting, fluid should be given intravenously.

Montezuma's Revenge

Nausea, vomiting and diarrhea should be treated by a clear liquid diet, stopping all solid food, and give Cipro 250 mg twice daily. Do not give Lomotil early, but allow nature to clear the GI tract of infection. Pepto-Bismol may be helpful. Most of these will be self limited. If there is fever, blood or pus in the stool, it may be one of the dysteries which include Salmonella, Shigella or Amebiasis. Get medical help immediately.

In Conclusion

One final suggestion from those who have hosted many short term visitors. If you live with a missionary family or eat with them, accommodate to their schedule and adapt to their standard of living. Do not ask for special foods or anything else. Try to make as few demands as possible. Do not expect sight-seeing trips or suggest eating out. They may not be able to afford these things and may be too busy or tired to cater to your whims.

If you want to purchase souvenirs, get an experienced person to go with you to avoid paying two or three times the real value. Do not buy ivory or items made with snake or lizard skin, for you may not be able to take these out of the country and may get into difficulties. You will lose them in US customs any way. If you are ever in doubt, ask others who know the answers before you do the wrong thing. Women should ask about clothing customs. Shorts are usually taboo and slacks are not always accepted. When women attend church, they should cover their heads in deference to their beliefs.

Observe these rules and you are apt to have an interesting and productive trip free of illness.


THANK YOU, DOCTOR, FOR COMING!

Chapter 15

Making the Most of Your Mission Experience

Julie Kelly
Stillwater, Oklahoma

When considering the mission field, one of the first questions is, "What about our children? How will it affect them." That was also my first thought when my husband asked me if I wanted to go to Africa. I told him, "No." I had a 1-year-old baby and didn't want him to get malaria. Three days later after reconsidering, I said, "Yes," that was probably what we needed to do. We did go to Africa and our baby did get malaria (2 or 3 times).

Children should be a concern to us when considering the mission field but not to the extent that we worry and fret. You do have to worry if your children are older (over 11 years old). Older children generally don't adjust very well. They are already familiar with their own culture and are comfortable with it for the most part and already have their own set of established friends.

Of course, you take the necessary health precautions such as boiling your drinking water, soaking your fruits and vegetables in a mild solution of iodine or chlorine, and washing your hands before eating, but the most important issues lie with your attitude towards where you are, what you are doing, and what you think about the people.

My husband and I spent 2 years in Cameroon, West Africa. Our son was a year old at the time. We also spent 10 years in Guatemala. Patrick, our oldest, was 6 years old, Katie was 4 years old, and Brian was 4 months old. They all had their bouts with illnesses but for the most part, adjusted to their new culture and stayed fairly healthy.

Our children were not always happy to be on the mission field. There were times when they missed the States and family. Our daughter especially missed a favorite cousin. Sometimes she would grieve about Gena and not getting to be with her.

Above all, you need to get as comfortable as you can with the language, culture, and people of your host country. I have given some suggestions that I feel will help you with your adjustment.

The mind-set of the parents, especially the mother, is important. The attitude should be: "We are here for a reason, a good one. This will be our home. We are glad to be here. We will serve people as best we can. We will love them and help them." You have to have an attitude of flexibility also: "Things aren't exactly what we are used to, but we'll work with what we have. Everything will work out fine."

Mixing with national people is one of the best ways to feel at home with your host country. Mix with the people you are serving as much as possible. Get to know them; you will soon love them for who they are – people – people with need – people with feelings – people that truly love you. You can share birthdays, weddings, and funerals. You can give them drop-in visit, "drop-by-something visit," or "drop-by-because-I'm worried-about-you visit." Make opportunities for your kids to mix; let them visit people, have people in, go to birthdays, let them stay overnight with people, etc.

Sharing a meal that has been prepared just for you and your family is an especially warm and enjoyable occasion and an excellent opportunity to be with people. We always accepted people's hospitality as graciously as it was given and without much thought about "getting sick." As it turned out, we never got sick eating in people's homes and we did it often. I did get sick once on a drop-by visit when I was given a taste of what the family was preparing for lunch. I thought at the time I would probably get sick as the family was pretty dirty, but I wasn't going to hurt their feelings by refusing their food. I just took my worm medicine when I found out I had something and was done with it.

In Guatemala, we were always part of other families. We shared special times together like birthdays and holidays. Sometimes we were invited to planned outings like a picnic at the river or a hike to a personal farm in the mountains. Our two younger children had adopted grandparents from Nicaragua. They called them "abuelito" and "abuelita" (grandfather and grandmother). Their older children became their "tio" (uncle) and "tia" (aunt). They would spend time with them (sometimes overnight) and always received special treatment. They loved their grandmother's "gallo pinto" (beans and rice as prepared in Nicaragua).

When we first moved to Guatemala, we purposely didn't associate with American people. We wanted to become completely comfortable with the language and the culture. We knew we could only do that by isolating ourselves from what we were most comfortable with – English and Americans. We actually moved in with a Latino family for seven months. We had our own apartment, but we had access to the rest of the house and ate with the family. Our children played with their children and began learning Spanish by "osmosis" as children do.

The result of surrounding ourselves with the language and culture was that we learned Spanish very well and adjusted to the culture very well (for the most part). Something else we did that helped with our adjustment was to wait until we had been in the country three years before we went to the States. (We did have many American visitors including family to ease the pain of being separated from our own culture.)

In adjusting to a new culture, you have to learn to appreciate the basics: food, shelter, God's beauty around you, people (friends, people in general), clothes, having what you need, God's presence (his love, his help), etc. You also have to learn to enjoy simple pleasures: Drinking a cup of coffee with friends, sitting around visiting with visitors from the States, sitting on a moonlit patio when the electricity is off. Learn to appreciate what your host country has that your own doesn't (fresh vegetables, warm temperatures year-round, a slower pace of life, for example).

You can help your children to adjust by involving them in your mission work whenever possible so they will feel like it's their work too. Our children served as translators for medical campaigns that came down. My daughter also helped me with a weekly children's class I had for a while.

Help your children see that their experience in another country is interesting and good for them. They are learning about people other than their own, another culture, and another language. Tell them what an opportunity it is and that other kids in the States don't have the same opportunity as they do. Make them feel special because of their experience.

Be as positive as possible. Help your kids feel good about being where they are. When my daughter was feeling homesick for relatives, I would tell her, "It's good to be here. Your dad is helping a lot of people that wouldn't be helped if we weren't here." She would still be homesick after that but would feel better about being where she was. I think it also helped to not make her resentful for being somewhere she didn't necessarily want to be at the time.

Write letters to relatives and friends. You don't feel so cut off if you keep in touch. I used to imagine that the person I was writing was right there with me as I wrote to them. It also helps to pray for your loved ones. You feel "connected" to them even though they are far away.

Photographs of loved ones help you to maintain your connection as well. When we went to Africa with our first child who was a year old, I took photos of all the significant family members in his life. I displayed them in a big frame and hung them on the wall. I would lift him up to the pictures and talk to him about the people and teach him their names. I wanted him to know his family when we returned to the States.

Learn to enjoy your own family. Do things together: Play games, sing and play the guitar, go swimming together, sit and talk, take walks together. When we were in Guatemala, we would go swimming at a hotel one hour away almost every week. We would spend the entire day there. We would also take walks through the coffee farms near the small town where we lived. It was fun being together.

You will gradually feel "at home" in your new culture. You will also find things that you like about your new culture that you don't have in your own.

For example, we had tree-ripened bananas in Guatemala. Once you've had the "real thing," you'll never be satisfied with the ones that have been picked green and "gassed" to ripen. We also enjoyed many typical foods prepared in Guatemala. Above all, we loved the people immensely and they loved us. Many tears flowed when we left (ours and theirs).

Some things you'll never get used to. It always bothered my children that they were looked at when they walked down the street. Being different is not fun especially for a teenager, and we had two of them. I never got used to being asked for money because we were "rich." Actually anyone with a regular salary was rich in Guatemala. Many people didn't know where their next meal was coming from from day to day. Most of the requests for money were very legitimate and we were glad to help if we could, but others were a "let's-see-what-I-can-get" request. We once helped a family of ten children with blankets, coats, and shoes. It wasn't long before other members of the family were arriving at the door with their requests. One simply asked, "What do you have for me?" She didn't even have a specific need at the time.

Overall, an extended cultural experience outside your own country is very beneficial. Your "gains" are much greater than your "losses." If done correctly, your children will be better people because of their exposure to another culture, country, and people.


THAT'S YOUR ANESTHETIC?

Appendix

The Missionary's Medicine Chest

This list of supplies is considered basic for a missionary family entering the field for a prolonged stay and who will have little access to any medical facility. Others might produce a somewhat different list. The amount of material may seem excessive but until one has been in a Third World country, one cannot imagine the difficulty in obtaining what would seem to be the simplest of basic health items. This listing is not in any particular order. See also list on page 47.

Sterile gauze pads 2" x 2" and 4" x 4" - 5 packs of 5
Cotton balls - 2 packages
Adhesive tape, 1" and 2" - 2 rolls of each
Q-tips - 1 container
Band-aids - 1" and 3/4" and small strips
Scissors with sharp points
Bandage scissors
Tweezers of good quality
Fever thermometer - oral and rectal
Syringes, 1 cc and 2 cc - 5 of each
Hypodermic needles. #26 or 27 and #20 or 21 - 10 of each
Blood pressure machine, Mercury or electronic. If electronic take batteries.
Roller bandage (Kling), 2" and 4" - 2 rolls of each
Elastic bandage, 2" and 4" - 2 rolls of each
Rubber surgical gloves (sterile) size 7 or 7 ½ - 10 pairs
Isopropyl (rubbing) alcohol - 2 one pint bottles
Hydrogen peroxide - one bottle of 100 to 200 cc
Vaseline - one 2 ounce jar or tube
Vinegar - one half pint
Insecticide, aerosol container, Pyrethrin - 4 containers
Promethean (To spray netting and clothing) - 4 containers
Insect repellant, DEET 30% liquid or aerosol - 4 units
Multivitamins with iron, 100 tabs - 6 bottles
Pepto-Bismol - one pint bottle
Imodium and/or Lomotil tablets
Tylonol, 250 mg tablets
Ibuprophin, 200 mg tablets
Caladryl
Triple antiobiotic cream
Hydrocortisone cream, 1%
Benadryl - 25 mg capsules

The Missionary's Pharmacy

This list of drugs and antibiotics is presented in the context of a missionary family residing in a tropical area of the Third World who have no immediate access to a doctor or hospital. The list also includes medicinal agents that are useful to maintain a backyard clinic. Many of these drugs are obtainable in native markets and chemists at high cost and with little assurance that the drug is genuine or effective. Many drugs are listed that one would not take with them but to help in obtaining the drug if it becomes necessary.

Antibiotics

Antibiotic agents should be used only when there is a real need and then in the proper dose and route of administration. They should not be used in the absence of real evidence of disease and generally not in the absence of fever.

Amoxicillin

Supplied in 250 mg and 500 mg capsules and in a suspension containing 125 mg/tsp. Dosage for adults is usually 250 mg every eight hours.

Ampicillin

Supplied on 250 mg and 500 mg capsules and in a suspension of 125 mg/tsp. The adult dose is usually 250 to 500 mg three times daily. Ampicillin has a broader range of sensitive organisms than penicillin and includes some gram negative organisms. A very useful antibiotic.

Chloramphenicol

This antibiotic is not often used today because there is a small incidence of blood dyscrasia. (1:40,000) In the Third World it is one of the most valuable drugs for two reasons: It is the least expensive and it is always available. It is the drug of choice in typhoid. Supplied in 250 mg and 500 mg tablets and a suspension of 125 mg/tsp. It is also supplied as a suspension of 1 gram/ 2cc. The dosage is 250 or 500 mg orally every 6 hours. For children the dose is 125 mg every eight hours. It is the drug of choice in typhoid fever and is of value in most gram positive cocci infections and the most useful antibiotic in major staphylococcal infections due to organisms not sensitive to penicillin. It should be used orally if possible.

Cephalosporins

Trade names: Keflex, Ancef, Velosef, Mefoxin, Rocephin, Claforin, Fortaz, Tangisef and others. These are second and third generation penicillins which are broad spectrum and very useful. They are extremely expensive in

underdeveloped nations and are not always available. These facts limit their use in the mission field. They have cross allergic reactions with penicillin. They are supplied in 250 mg and 500 mg capsules and in a suspension containing 125 mg/teaspoon. The dosage may vary but is essentially the same as ampicillin.

Cipro (ciproflaxacin)

Cipro is one of the most valuable antibiotics effective against a wide range of organisms. It is of particular value in pulmonary infections and diverticulitis. It has a serious cross reaction in patients taking theophylline for asthma and must not be used simultaneously. There are a number of minor reactions and its use in pregnant women has not been defined. It is supplied in 250 mg, 500 mg and 750 mg tablets. There is also an intravenous form. The dosage for mild infections such as urinary infections is 250 mg every 12 hours. For most infections 500 mg every 8 to 12 hours can be used. For very severe infections 750 mg every 12 hours can be used.

Doxycillin

This drug is in all ways similar to tetracycline except that the dosage is twice daily instead of three or four times daily. It is supplied in 50 mg and 100 mg capsules. The dosage is 200 mg the first day and 100 mg daily afterward. For children 12 to 16 the dose is ½ that of the adult dose.

Erythromycin

Erythromycin has the same bacterial spectrum as penicillin. It is more expensive. It is primarily used in those patients allergic to penicillin. It may be irritating to the stomach and should be taken with milk or food. It is supplied in 250 mg and 500 mg tablets and in a suspension of 125 mg/ teaspoon. The usual dose is 500 mg three times daily in adults and from 125 mg to 250 mg three times daily in children.

Metronidazole (Flagyl)

This is a most valuable drug for treating amebiasis, giardiasis and trichomoniasis infections. It is also an effective drug when used in combination with Cipro in treatment of acute diverticulitis and other intestinal organism infections. This drug cannot be used during pregnancy and is inconsistent with alcohol ingestion. It is supplied in 250 mg tablets. The usual dosage is one tablet three times daily. In amebiasis the dose is doubled.

Gentamicin, Kanamycin

These are injectable antibiotics which are primarily useful in gram negative bacterial infections. They have been extensively over used. They should be reserved for gram negative infections. Neither drug should be used for more than 3-5 days because of renal toxicity and neurotoxicity of the eighth cranial nerve. Kanamycin is supplied in vials of 1 gram in 5 cc. Gentamicin is supplied in vials of 40 mg in 2 cc. The dosage of Kanamycin is

500 mg intramuscularly every eight hours. The dosage of Gentamicin is 2-5 mg/kg divided into three doses. The usual dose is 80 mg every eight hours.

Penicillin

Penicillin, the first and still the most widely used antibiotic, is the most useful in gram positive infections such as streptococcal and pneumococcal infections. It is still the drug of choice for gonorrhea. There are many individuals who are allergic to penicillin and a careful history must be taken before using the drug. For some allergic reactions antihistamines are sufficient. For the more serious ones adrenaline and steroids are required.

Oral penicillin (Pen-V-K)

This antibiotic is supplied in 250 mg and 500 mg tablets and in suspensions containing 125 mg and 250 mg/teaspoon. The dose is typically two 250 mg tablets three times daily. For children two teaspoonsful every four to six hours.

Injectable penicillin

Crystalline Penicillin G. is a short acting form. It is supplied in vials of 1,000,000 units which can be given intravenously or intramuscularly. The dose is 1,000,000 units every four to six hours.

Procaine penicillin

This is an insoluble suspension which is absorbed slowly over eight to twelve hours. It is supplied in vials containing 600,000 units/cc and 1,200,000 units/cc. The adult dose is 600,000 - 1,200,000 units intramuscularly twice daily. The dose for children ages 8-12, is 600,000 units, for ages 3-7, 300,000 units every 12 hours. For ages 1-3, 150,000 units every 12 hours.

Benzathine penicillin (Bicillin)

This is a long acting, very slowly absorbed form of penicillin that can be given every thirty days. It is supplied in vials of 1,222,000 units in 2 cc. For intramuscular use only.

Streptomycin

This antibiotic is not used widely in Western countries now except in the treatment of tuberculosis. However, it is still a useful antibiotic in acute infections not susceptible to penicillin and when other drugs are not available. It is widely available in Third World countries and is inexpensive. It has the danger of eighth nerve damage if given in high dosage too long. It can be given in as much as 2 grams daily for 5-8 days without fear and in the dose of 1 gram daily for one month. The dose for acute bacterial infections has been confused by many doctors with the dose in tuberculosis. Any susceptible organism will become resistant with 72-96 hours. It is supplied in vials of 1 gram in 1 cc. The dose for acute infections is 500 mg every 6 hours for 72 hours.

Tetracycline

This was the first broad spectrum antibiotic. Many bacteria are resistant to it and this limits its usefulness. It is still a valuable antibiotic. It is supplied in 250 mg and 500 mg capsules and a suspension of 125 mg/tsp. The dosage is 25 to 500 mg every six hours. It should not be used in children under 8.

Sulfadiazine

There are several sulfonamides and they are sometimes combined into three drug tablets which seems to offer little benefit. Sulfadiazine is the best representative. It is effective in many infections although to a lesser degree than the antibiotics. Sulfadiazine is effective primarily in gram positive infections particularly in pneumococcal pneumonia. To prevent renal damage at least three liters of fluid must be taken daily. It is supplied in tablets of 500 mg and a suspension of 500/5 cc. The initial dose is four grams followed by 1 gram every 6 hours.

Sulfamethoxazole and Trimethoprim (Bactrim, Septra)

This combination is useful in a number of lesser infections particularly those of the urinary tract. It is supplied in tablets with 400 mg of sulfamethoxazole and 80 mg of trimethoprim. The dose is two tablets twice daily.

Antituberculosis antibiotics

Isoniazid

This is the single most effective drug for the treatment of tuberculosis. It should be given with one or two other first-line drugs to prevent the development of resistance. There are several side reactions including neuralgia, nerve tingling, depression, and liver damage. These are not common. It is supplied in 100 mg tablets. The usual dose is 300 mg once a day.

Rifampin

This is a widely used, first-line drug and should be given with isoniazid or other drugs. In mission areas it is extremely expensive. It has the risk of liver damage and is contraindicated in pregnancy. The drug will color all body excreta red-orange which should not alarm patients. It can also cause anorexia, vomiting, rash, and mental confusion. It is supplied in 150 mg and 300 mg tablets. The dosage is 10 mg/kg/day. The usual dose is 600 mg once daily. For children 8-12, 450 mg, 3-7, 300 mg and under three, 150 mg.

Pyrazinamide

This is another first line drug. It has a number of complications: painful joints, loss of appetite, vomiting, pain on urination, fatigue, and fever. It is not to be used during pregnancy. It is supplied in 500 mg tablets. The adult dose is 3-4 tablets daily. For children 8-12 the dose is 2 tablets daily, 3-7, 2 tablets daily, under three, ½ tablet.

Ethambutol

This is a useful drug in combination with other drugs in patients with sensitive organisms. It may produce eye problems with prolonged therapy. It is supplied in 100 mg and 400 mg tablets. The dose is 25 mg/kg/day or about 3 400 mg tablets once a day. After two months it is reduced to two 400 mg tablets daily. For children over 8, 15 mg/kg/day.

Streptomycin

It should be used with isoniazid or other drugs. It has the complication of vestibular damage (ataxia) if used in excessive dose. It is supplied in 1 gram vials. The adult dose is 1 gram intramuscularly for three to four weeks then 1 gram two or three times weekly. For children 8-12 give 750 mg two or three times weekly, age 3-7, 500 mg at same interval and under age three, 250 mg two times weekly.

Para-amino-salicylic acid

This drug can be used in combination with isoniazid or streptomycin. It must be given in large amounts (12 grams daily) which often causes nausea, vomiting and diarrhea. The amount given may be reduced or stopped temporarily. It is inexpensive and available in Third World countries. It is supplied in 500 mg tablets. The dose is 4 tablets 6 times daily or 6 tablets four times daily.

Anti-Malarial drugs for prophylaxis

Chloroquine

Chloroquine is the most used and most reliable drug of suppression of malaria. It is supplied locally in 250 mg tablets and as Aralen which contains 500 mg (300 mg base). The dose for the 250 mg tablet is 2 tablets once a week. For Aralen, it is 1 tablet weekly. There are increasing numbers of parasites resistant to Chloroquine. The P. Falciparum are the resistant parasites. For suppression it should be started two weeks before entering a malaria area and for four weeks after leaving.

Mefloquin (Larium)

This is the most effective suppressant for P. Falciparum. It has a number of side effects including mental confusion, vertigo, gastritis, headache, vision problems, abnormal behavior, and ventricular fibrillation has been seen. It should be taken with a full meal. It is not to be taken by pregnant women. It is supplied in 250 mg tablets. The dose is one tablet weekly. Like Chloroquine it should be taken two weeks before travel and for four weeks after leaving.

Hydroxy Chloroquine (Plaquenil)

It is supplied in 200 mg tablets. The dose is 400 mg once a week.

Doxycycline (Vibramycin)

It is supplied in 100 mg tablets. The dose is one tablet daily.

Preagonal (Paludrine)

It comes in 100 mg tablets. The dose is two tablets daily.

Pyrimethamine (Daraprim)

It is supplied in 100 mg tablets. The dose is one tablet weekly.

Primaquine

It is supplied in tablets containing 15 mg base. The dose is one a day for 14 days usually given with Chloroquine to prevent relapse.

Treatment of acute malaria

Chloroquine

Using Aralen give two tablets immediately, give one tablet six hours later and one tablet daily for two days. If using the 250 mg plain tablet double the dose above. In critically ill or comatose patients give 200 mg base intramuscularly and repeat in six hours.

Amodidiaquin

It is supplied in tablets containing 300 mg base. The dosage is two tablets initially and 400 mg daily for two days.

Pyrimethamine with sulfadoxine (Fansidar)

This agent is for treating resistant forms of malaria. It is supplied in tablets with 25 mg of pyrimethamine and 500 mg of sulfadoxine. The dose for adults is three tablets one time. For children 9 to 14 years, two tablets. For children four to eight years, ½ tablet. For children one to three years, ½ tablet. For children under one year ¼ tablet.

Quinine

It is supplied in 300 mg tablets and in liquid form. The usual dose is two tablets three times a day for three days. It may be given intramuscularly or intravenously but there is considerable danger, therefore, this should be done by a physician. Quinine is a sort of last resort in treating resistant parasites when other drugs have been ineffective.

Drugs for amebiasis and other protozoans

Metronidazole (Flagyl)

Supplied in tablets of 200 mg, 250 mg, and 500 mg and vaginal suppositories of 500 mg. The dosage is 25-50 mg/kg/day. The usual adult dose is 750 mg three times daily. Children 8-12, 500 mg three times daily, 3-7, 300 mg three times daily. For giardiasis the dose is 250 mg three times daily. For vaginal trichomoniasis use one suppository three times daily.

Diloxanide (Furamide)

It is supplied as 500 mg tablets and in a syrup containing 125 mg/5 cc. The dose is one tablet three times daily. For children 8-12, ½ tablet three times daily and for ages 3-7, ¼ tablet or one teaspoon three times daily.

Tetracycline

Supplied as 250 mg capsules. The dose is one capsule four times daily for 10 days.

Chloroquine

It is supplied as tablets of 250 mg sulphate and 200 mg as the phosphate. The dose is ½ tablet three times daily for three weeks.

Drugs for intestinal worms

Mebendazole (Vermox)

This drug is effective against hookworm, ascaris, whipworm, and strongyloides. It is not to be used in pregnant women or in children under two. It is supplied as 100 mg tablets. The dosage is one tablet two times a day for three days.

Albendazole (Zentel)

This drug is effective against hookworm, ascaris, whipworm, and strongyloides. It is supplied in 200 mg and 400 mg tablets. The dose is 400 mg one time only.

Piperazine

This drug is effective against ascaris, threadworm and pinworm. It is supplied in 500 mg tablets and as a liquid containing 500 mg/5 cc. The dose is seven tablets as a one time dose. Children 8-12, five tablets, and children 3-7, three teaspoonfuls.

Thiabendazole

This drug is effective against many worms but is primarily used for ascaris. It has more side reactions and it is wise to give piperazine before giving thiabendazole. It is supplied as 500 mg tablets and as a liquid containing 1 gram in 5 cc. The dosage is three tablets two times a day for three days. In children 8-12, two tablets or one teaspoon three times a day, For ages 3-7, ½ teaspoon, under 3, ½ teaspoon.

Tetrachloroethylene

This is supplied in a liquid form. The dose is .10 - .12 cc/kg with a maximum of 5 cc. It is given in a single dose. This is probably the best drug for hookworm.

Bephenium (Alcopar)

This is supplied in a packet of granules of 5 grams. The dose is one packet with water. For children of less than 20 kg the dose is ½ packet. This is probably the drug most likely to be available in most Third World countries.

Pyrantel Pamote (Anitminth, Cobrantril, Helmex)

This drug is effective against all of the intestinal worms but is used most often for pinworm and whipworm.

It is supplied as 250 mg tablets and as a suspension containing 250 mg/5 cc.

The dose is 10 mg/kg. The usual amount is three tablets as a single dose and repeat in two weeks. For children 10-14, two tablets, for ages 6-9, 1 tablet, for ages 2-5, 300 mg, for age under two years, 62 mg.

Niclosamide (Yomesan)

This agent is useful in treatment of tapeworm. It is dispensed as 500 mg tablets. The dose for adults is four tablets which are to be chewed before swallowing. For children 2-8 years, two tablets, for ages under two one tablet crushed.

Praziquantel (Biltricide, Droncit)

This agent is not to be taken by pregnant women and children under the age of four. Women who are breast feeding should not take the drug. This drug is used for tapeworm. It is supplied in tablets of 150 mg and 600 mg.

The dose for adults is one 600 mg tablet, for children 8-12, the dose is ½ tablet, for children 4-7 years the dose is one 150 mg tablet or ¼ 600 mg tablet.

Quinacrine (Atabrine)

This agent is useful in treating tapeworm. It is dispensed as a 100 mg tablet. The dose for adults is one gram as a single dose (10 tablets), for children 8-12 years, 600 mg (6 tablets) and for children 3-7 years 400 mg or 4 tablets.

This drug will often induce vomiting, therefore, use Benadryl 50 mg or Promethazine 25 mg to prevent nausea.

Drugs for schistosomiasis

Praziquantel (Biltricide, Droncit)

See details in previous section. The drug is dispensed in 150 mg and 600 mg tablets. The dose is four to six tablets in one dose. For children ages 8 to 12, three or four tablets and for children 4 to 7, one and one-half tablets. To be taken with a large meal. Not to be taken by pregnant women or nursing mothers unless nursing is discontinued for 72 hours.

Metrifanate (Bilarcil)

This drug is used for S. Hemotobium. It is not to be used by pregnant women. It is supplied in 100 mg tablets.

The dose is 10 mg/kg. The usual amount is 400 mg to 600 mg in one dose and repeated twice at weekly intervals. For children 6-12, years 300 mg and for children 3-5 years, 100 mg.

Oxyamniquine (Vansil, Mansil)

This drug is useful in S. Mansoni. It is dispensed in 250 mg capsules and in syrup with 250 mg/5 cc. The dose is: adults 15 mg/kg/twice a day. For children it is 10 mg/kg/twice a day. The usual dose is 750 mg - 1000 mg in one dose. For children ages 8 to 12, 250 mg twice in one day, for ages 4 to 7, 125 mg twice in one day, and for ages 1 to 3 the dose is 65 mg twice in one day.

Drugs for filariasis

Ivermectiln (Mectizan)

This drug is not to be given to children weighing less than 15 kg or under 5. It is supplied in 6 mg tablets.

The doses are: Adults over 64 kg two tablets, for adults 45 to 63 kg, one and a half tablets, and for adults weighing 26 to 44 kg, one tablet. For children 15 to 25 kg the dose is one-half tablet. The drug is not to be used in pregnant or nursing women.

Diethylcarbamazine (Hetrazan, Banocide)

This is probably the most useful drug in treating Loiasis and Onchocercosis. It is effective against the microfilaria but does not kill the adult parasite. Symptoms are relieved sometimes for many weeks. In the case of onchocerciasis the drug must be started as a low dose and increased gradually. Killing the parasites in large numbers may produce severe allergic reactions and an antihistamine should be given throughout the treatment. Reactions may require steroid for control. It is supplied in 50 mg tablets. The full dose is three tablets daily for a minimum of 14 days.

Suramin (Naphuride, Bayer 205, Antrypol)

This drug is more effective than diethylcarbamazine but must be given intravenously and often causes renal damage. The usefulness is limited because of these two facts. It is supplied in 1 gram vials. The dose is one gram in 10 cc of water once a week for 5 to 7 weeks.

Eye medications

Simple eye irritations can be treated with eye drops such as Murine and Visine. An antibiotic ophthalmic ointment should be used if there is purulent drainage. This may be neosporin or tetracycline.

Pain medications and sedation

Aspirin

Aspirin may be used for simple pain such as headache but it is capable of producing gastric ulceration and inflammation and interferes with the blood clotting mechanism. For these reason it should only be used occasionally. It is effective in lowering fever. It comes in 325 mg and 125 mg tablets and in a pediatric suspension.

Acetaminophen

Acetaminophen (Tylenol) is preferable. The drug is supplied as a 325 mg tablet and in a pediatric suspension, 125 mg/5 cc. The dose is one or two tablets no more often than 6 hours. For children one teaspoon every four to six hours. This is the preferable medication for pain and for lowering temperature. It is supplied in 325 mg and 500 mg tablets and in a liquid

form for children. The dose is one or two tablets no more often than every six hours. It is wisest not to take medications containing codeine or other narcotics and rely upon the simple drugs.

Ibuprofen (Motrin, Advil and others)

This drug is useful in headache and in arthritic pain. It is reasonably safe and can be taken over long periods of time. It is dispensed as 200 mg tablets. The usual dose is 400 mg every six hours although the dosage may be increased for short periods.

Benadryl

Benadryl is an effective antihistamine that is also useful as a mild sedative. It is safe to use for this purpose but no sedative should be used continuously or even frequently. It is dispensed as 25 mg capsules and in liquid form in 12.5 mg/5 cc. The dosage for adults is 25 mg to 50 mg. For children one teaspoon is sufficient.

Phenergan

This drug is a potent antihistamine and a moderately strong sedative and is also used to treat nausea. It is supplied in 12.5 mg, 25 mg and 50 mg tablets and in suppositories of 12.5, 25, and 50 mg. For adults the dose is 25 mg to 50 mg and for children 12.5 mg.

There are many additional sedatives and tranquilizers which are often used and abused for stress and sleeplessness. All are habit forming and capable of producing psychological dependence. They are not the answer to emotional problems, stress or social or marital conflicts.

Drugs for treatment of allergic reactions

Benadryl

See above discussion.

Phenergan

See above discussion.

Prednisone

This is a cortisone like steroid which is a very potent drug. It should not be used except for serious allergic phenomena and asthma not otherwise controllable. It is best to let a physician prescribe its use. It must not be used for prolonged periods. It is dispensed in 5 mg and 10 mg tablets. The following dosage schedule is typical of the way it should be used. The amount may vary. First day, 30 mg in divided doses, second day, 25 mg in divided doses, third day 20 mg in divided doses, fourth day 10 mg, fifth day 5 mg, sixth day discontinue. It may be necessary to stay at each level for two days in some cases. This schedule should not be repeated more often than at three or four month intervals.

Medicines for diarrhea

Pepto-Bismol

It is dispensed in varying size bottles and in tablets. The dose is two tablets or tablespoons every hour up to eight tablets or tablespoons.

Kaolin with pectin (Kaopectate)

This preparation is dispensed as a suspension. The dose is two to eight tablespoons four to five times daily. For children one to two tablespoons three times daily.

Imodium

This agent is supplied in liquid form and in capsules and capulets. The dose is four teaspoons or two capulets after first bowel movement and repeat after subsequent stools up to a maximum of eight teaspoons or four capulets or capsule in 24 hours.

Lomotil

This drug combination is 2.5 mg of diphenoxylate and .025 mg of atropine per tablet or in 5 cc of liquid.

It is dispensed in tablets and in liquid form. The dose is usually two tablets or two teaspoons four times daily until diarrhea is controlled. The dosage in children is precise and the author's recommendation is that it not be used for children. This drug is habit forming and is considered a Class V narcotic. It should not be used more than two or three days at any one time and not given often.

Despite the directions given above, most gastroenterologists prefer not to try to stop diarrhea for at least three to four hours so that the toxic agent or bacteria may be cleared from the intestinal tract first.

Anti-nausea medications

There are a number of drugs other than those listed but the listed ones are typical and effective.

Antivert

This drug is supplied as 12.5 mg and 25 mg tablets. The dose is 25 to 100 mg every eight to 12 hours.

Compazine

The drug is supplied in 5 mg and 10 mg tablets, in 2 cc injectable form as 2 cc with 5 mg/cc disposable syringes, and as suppositories containing 2.5 mg, 5 mg or 25 mg. The dose should be the lowest that is effective. For adults one 5 mg or 10 mg tablet three or four times daily. The injectable form is not recommended for use by nonmedical people. It is not recommended for children under 20 pounds. For children 20 to 29 pounds, 2.5 mg one or two times daily. For children weighing 30 to 39 pounds, 2½ mg two or three

times daily. For children weighing 40 to 85 pounds, 2½ mg three times daily or 5 mg twice daily. The children may use either the oral or suppository form.

Tigan

Tigan is supplied as capsules of 100 mg and 250 mg. It is supplied in suppositories of 100 mg and 200 mg. It also comes in injectable form which should be given under medical supervision. The dose for adults is 250 mg three or four times daily or one 200 mg suppository three or four times daily. For children under 30 pounds, one 100 mg suppository three or four times daily. For children weighing 30 to 90 pounds, one or two 100 mg suppositories three or four times daily.

Drugs for hyperacidity, indigestion or nonspecific gastrointestinal symptoms.

For prolonged symptoms, persistent pain, tarry stools, or vomiting of blood, medical consultation should be obtained.

Antacids

Calcium carbonate (Tums)

This drug is usually dispensed as a 500 mg tablet. It can be used as one or two tablets every two to four hours not to exceed 16 tablets in a 24 hour period.

Mylanta

It is dispensed as a liquid or in tablets. The dose is two teaspoons or two tablets three times daily.

Amphogel

It is also supplied as a suspension or as tablets. The dose is two teaspoons or two tablets five or six times daily.

Cimetidine (Tagamet)

This agent inhibits gastric acid formation and should be used chiefly for those with peptic gastritis, peptic ulcer or esophagitis. It is not to be taken by women who are pregnant or nursing. It is dispensed in 200 mg tablets. There is an injectable form which should be used by physicians. The dosage is two tablets twice daily.

Ranitidine (Zantac)

This drug is similar to cimetidine. It is dispensed in tablets of 150 mg or 300 mg. The usual dose is 150 mg twice daily. There are several other drugs of this type. All are expensive and should not be used for ordinary symptoms of indigestion or heartburn but should be reserved for treatment of diagnosed disease. A doctor should prescribe these drugs.

Donnatal

This drug is a combination of four agents and is useful in nonspecific

gastrointestinal symptoms. It is dispensed as a tablet or an elixir. The dose is one tablet three times daily or one teaspoon three times daily.

Medications for respiratory problems

Common cold

Neo-Synephrine nose drops
Actifed
Sudafed
Seldane
Tylenol cold tablets
Ornade spansules

These are only a few of the dozens of over-the-counter preparations. Most have the same ingredients. Directions and precautions are on or in the package.

Cough

Robitussin DM
Dimetane DC
Novahistine expectorant

Again, these are representative and there are many others.

Asthma

Aminophylline

This is the most used and effective drug. It is dispensed in 100 mg tablets. The dose is usually one tablet every six hours. Refractory asthma may require more.

Salbutol

This drug is supplied in 4 mg tablets and in syrup containing 2 mg/5 cc. The dose is one tablet every four to six hours.

Ventolin

This is an inhaler which may give relief in acute episodes. It is dispensed as a unit with directions.

As mentioned in the area of Health Maintenance, asthma is a disease which should be evaluated prior to travel and all necessary drugs brought with you. Also asthma often tends to be worse and less responsive to medication in the tropics.

Skin medications

There are an infinite number of skin diseases, many of which have specific treatments. The lay person cannot be expected to make accurate diagnoses, therefore, this list of drugs are essentially those for symptomatic relief with a few exceptions.

Calamine lotion
Caladryl lotion
Sulphur ointment
Gentian Violate

This is useful in some fungus infections and in impetigo.

Antibiotic creams or ointments.

Antibiotics are not very effective topically. For example, impetigo is best treated with oral antibiotics.

Neosporin ointment or cream
Triple antibiotic ointment or cream
Polysporin ointment or cream
Whitfield's ointment

This is a combination of salicylic acid and benzoic acid and is useful in many skin fungus infections.

Desenex cream and powder

This agent is used for athletes' foot and fungus infections in the inguinal area.

Selenium sulfide

This lotion is useful in treating tinea versicolor.

Griseofulvin

This is useful in treating severe fungus infections of the scalp and nails. It is supplied in tablets or capsules of 250 mg and 500 mg. The dose is one tablet daily for at least 30 days.

Nystatin

This fungicide is supplied in ointment, cream, powder and vaginal suppositories. It is also dispensed in 250 mg capsules however these should be prescribed by a doctor. The topical forms may be used for various fungus infections of the mouth and vagina. Directions will be in the package.

Gamma benzene hexachloride (Lindane, Kwell, Gammesane)

This comes in a lotion and is specific for treating scabies (itch mite) and lice. This drug may be toxic and should be used only when necessary and not overused.

Steroid ointments and creams

Triamcinolone acetonide (Aristocort, Nasocort)

This is an effective treatment for skin problems such as contact dermatitis like poison ivy and for seborrheic dermatitis. It is supplied in ointment and cream in a concentration of .05% and .1%.

Betamethasone

Similar to above and the preparations are the same.

Flurandrenolide

Similar to above in concentration and use.

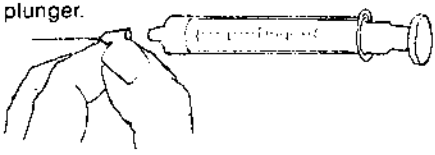
HOW TO PREPARE A SYRINGE FOR INJECTION

Before preparing a syringe, **wash hands with soap and water.**

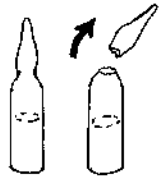
1. Take the syringe apart and boil it and the needle for 20 minutes.

2. Pour out the boiled water without touching the syringe or the needle.

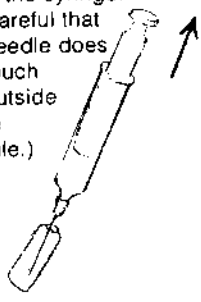
3. Put the needle and the syringe together, touching only the base of the needle and the button of the plunger.



4. Clean the ampule of distilled water well, then break off the top.

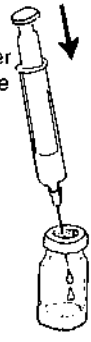


5. Fill the syringe. (Be careful that the needle does not touch the outside of the ampule.)

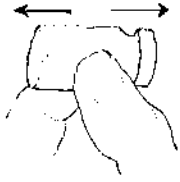


6. Rub the rubber of the bottle with clean cloth wet with alcohol or boiled water.

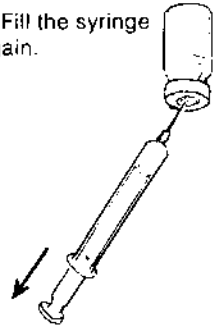
7. Inject the distilled water into the bottle with the powdered medicine.



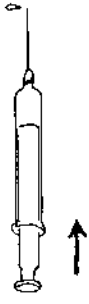
8. Shake until the medicine dissolves.



9. Fill the syringe again.



10. Remove all air from the syringe.



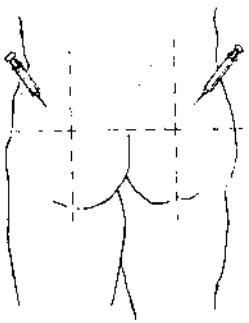
Be very careful not to touch the needle with anything—not even the cotton with alcohol. If by chance the needle touches your finger or something else, boil it again.

From: *Where There Is No Doctor, A Village Health Care Handbook,* page 72.

WHERE TO GIVE AN INJECTION

Before injecting, **wash hands with soap and water.**

It is preferable to inject in the muscle of the buttocks, always in the **upper outer** quarter.

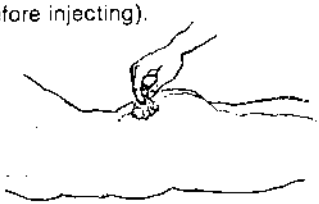


WARNING: Do not inject into an area of skin that is infected or has a rash.

Do not inject infants and small children in the buttock. Inject them in the **upper outer** part of the thigh.

HOW TO INJECT

1. Clean the skin with soap and water (or alcohol—but to prevent severe pain, be sure the alcohol is dry before injecting).

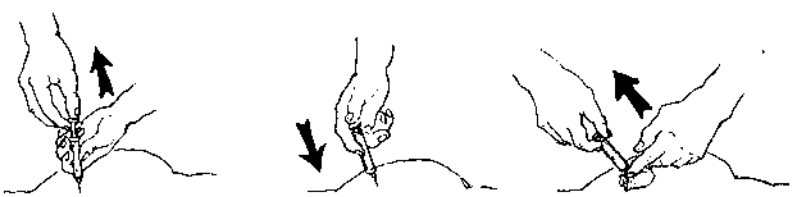


2. Put the needle straight in, all the way. (If it is done with one quick movement, it hurts less.)

3. Before injecting, pull back on the plunger. (If blood enters the syringe, take the needle out and put it in somewhere else).

4. If no blood enters, inject the medicine slowly.

5. Remove the needle and clean the skin again.



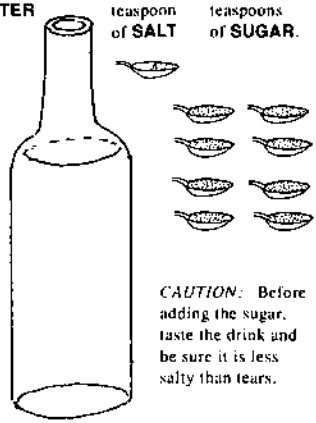
6. After injecting, rinse the syringe and needle at once. Squirt water through the needle and then take the syringe apart and wash it. Boil before using again.

From: *Where There Is No Doctor, A Village Health Care Handbook,* page 73.

2 WAYS TO MAKE 'HOME MIX' REHYDRATION DRINK

1. WITH SUGAR AND SALT (Raw sugar or molasses can be used instead of sugar.)

In 1 liter of clean **WATER** put half of a level teaspoon of **SALT** and 8 level teaspoons of **SUGAR**.

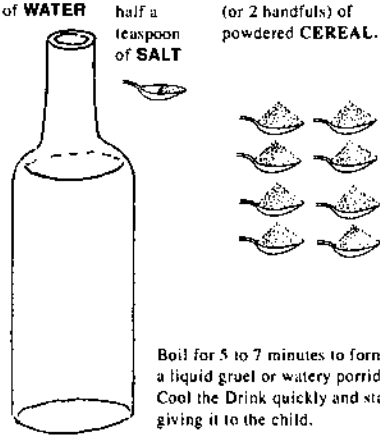


CAUTION: Before adding the sugar, taste the drink and be sure it is less salty than tears.

To either Drink add half a cup of fruit juice, coconut water, or mashed ripe banana, if available. This provides potassium which may help the child accept more food and drink.

2. WITH POWDERED CEREAL AND SALT
(Powdered rice is best. Or use finely ground maize, wheat flour, sorghum, or cooked and mashed potatoes.)

In 1 liter of **WATER** put half a teaspoon of **SALT** and 8 heaping teaspoons (or 2 handfuls) of powdered **CEREAL**.



Boil for 5 to 7 minutes to form a liquid gruel or watery porridge. Cool the Drink quickly and start giving it to the child.

CAUTION: Taste the Drink each time before you give it to be sure it is not spoiled. Cereal drinks can spoil in a few hours in hot weather.

IMPORTANT: Adapt the Drink to your area. If liter containers or teaspoons are not in most homes, adjust quantities to local forms of measurement. Where people traditionally give cereal gruels to young children, add enough water to make it liquid, and use that. Look for an easy and simple way.

From: ***Where There Is No Doctor, A Village Health Care Handbook,*** **page 152.**

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The Geographical Distribution of Communicable Diseases in Tropical Areas

This compilation has been adapted from the text "Tropical Medicine" by Hunter, Swartzwelder and Clyde. It is not complete but it may be helpful to those traveling to a tropical area. They may be able to identify those diseases that are common in the area to which they are going. In many countries the distribution within the country is not uniform and local inquiry will have to be made in a specific area.

Central America, Panama and Mexico

Helminth Diseases (worms)
- Hookworm
- Ascaris
- Whipworm
- Strongyloidiasis (Thread worm)

Protozoan Diseases
- Amebiasis
- Leishmaniasis
- Malaria
- Trypanosomiasis (Chagas' disease)

Bacterial Diseases
- Anthrax
- Brucellosis
- Shigellosis
- Leptospirosis
- Relapsing fever
- Leprosy
- Typhoid fever

Rickettsial Diseases
- Epidemic typhus fever
- Endemic typhus fever
- Tick-borne spotted fever

Viral Diseases
- Western equine encephalitis
- Eastern equine encephalitis
- Hepatitis
- Trachoma
- Rabies

Caribbean Area

Helminth Diseases
- Hookworm
- Tapeworm
- Ascaris
- Schistosomiasis
- Whipworm
- Filariasis (W. Bancrofti)
- Threadworm

Protozoan Diseases
- Amebiasis
- Malaria
- Trypanosomiasis

Bacterial Diseases
- Anthrax
- Brucellosis
- Shigellosis
- Leprosy
- Tetanus
- Typhoid and paratyphoid fever

Viral Diseases
- Viral encephalitis
- Dengue fever
- Hepatitis
- Rabies

Rickettsial disease
- Murine typhus fever

Tropical South America

Helminth Diseases
- Hookworm
- Ascaris
- Whipworm
- Threadworm
- Tapeworm
- Filariasis (W. Bancrofti and onchocerciasis)
- Hydatid disease
- Schistosomiasis

Protozoan Diseases
- Amebiasis
- Leishmaniasis
- Malaria
- Trypanosomiasis (Chagas' Disease)

Bacterial Diseases
- Anthrax
- Brucellosis
- Shigellosis
- Plague
- Leprosy
- Yaws
- Tetanus
- Typhoid and Paratyphoid fever

Rickettsial Diseases
- Epidemic, louse-borne typhus
- Murine, tick-borne typhus
- Tick-borne spotted fever

Viral Diseases
- Yellow fever
- Rabies
- Dengue fever
- Hepatitis
- Venezuelan equine encephalitis
- Multiple, fever inducing arboviral diseases
- Eastern equine encephalitis
- Western equine encephalitis

Fungal Diseases
- Coccidioidomycosis
- Histoplasmosis
- Blastomycosis

Temperate South America

Helminth Diseases
- Hookworm
- Ascaris
- Whipworm
- Threadworm
- Tapeworm
- Hydatid disease

Protozoan Diseases
- Amebiasis
- Leishmaniasis
- Trypanosomiasis (Chagas' disease)

Bacterial Diseases
- Anthrax
- Brucellosis
- Shigellosis
- Leptospirosis
- Plague
- Leprosy
- Typhoid fever
- Tick-borne relapsing fever

Rickettsial Diseases
- Louse-borne epidemic typhus fever
- Flea-borne murine typhus fever

Viral Diseases
- Hemorrhagic fever
- Hepatitis
- Rabies

Fungal Diseases
- Maduromycosis
- Coccidioidomycosis
- Histoplasmosis

Southern Europe

Helminth Diseases
- Hookworm
- Ascaris
- Whipworm
- Tapeworm
- Schistosomiasis
- Filariasis (W. Bancrofti)
- Fascioliasis

Protozoan Diseases
- Amebiasis
- Leishmaniasis (Kala-azar)
- Cutaneous Leishmaniasis
- Malaria (rare)

Bacterial Diseases
- Anthrax
- Brucellosis
- Shigellosis
- Leptospirosis
- Leprosy
- Louse-borne relapsing fever
- Tick-borne relapsing fever
- Typhoid and Paratyphoid fever

Rickettsial Diseases
- Epidemic typhus fever
- Q-Fever
- Murine typhus fever

Viral Diseases
- Crimean hemorrhagic fever
- Naples & Sicilian Phlebotomus fever
- West Nile fever
- Central European tick-borne
- Encephalitis
- Hepatitis
- Rabies

North Africa

Helminth Diseases
- Hookworm
- Ascaris
- Whipworm
- Threadworm
- Tapeworm
- Strongyloidiasis
- Schistosomiasis
- Filariasis (W. Bancrofti)

Protozoan Diseases
- Amebiasis
- Leishmaniasis
- Malaria

Bacterial Diseases
Brucellosis
Shigellosis
Cholera
Leprosy
Typhoid and Paratyphoid fever
Rickettsial Disease
Louse-borne epidemic typhus
Viral Diseases
Naples-Sicilian phlebotomus fever
Hepatitis
Trachoma

West Africa

Helminth Diseases
Hookworm
Ascaris
Whipworm
Threadworm
Tapeworm
Hydatid disease
Filariasis (W. Bancrofti, Loiasis and Onchocerciases)
Protozoan Diseases
Amebiasis (highly endemic)
Leishmaniasis (Kala-azar)
African Trypanosomiasis
Malaria (universal)
Bacterial Diseases
Brucellosis
Cholera
Shigellosis
Leprosy
Tick-borne relapsing fever
Yaws
Typhoid and paratyphoid fever
Rickettsial Diseases
Louse-borne typhus fever

Viral Diseases
- Dengue fever
- Yellow fever
- Hepatitis (Extremely common)
- Lassa fever
- Rabies (common)

Central Africa

Helminth Diseases
- Hookworm
- Ascaris
- Whipworm
- Threadworm
- Tapeworm
- Schistosomiasis
- Filariasis (W. Bancrofti, Loiasis and Onchocerciasis)

Protozoan Diseases
- Amebiasis
- Malaria
- African Trypanosomiasis
- Hepatitis

Bacterial Diseases
- Anthrax (rare)
- Brucellosis
- Shigellosis (common)
- Cholera (common)
- Leptospirosis
- Plague
- Yaws

Rickettsial Diseases
- Louse-borne epidemic typhus

Viral Diseases
- West Nile fever
- Yellow fever
- Hepatitis
- Rabies
- Trachoma

East Africa

Helminth Diseases
- Hookworm
- Ascaris
- Whipworm
- Threadworm
- Tapeworm
- Filariasis (W. Bancrofti, Loiasis and Onchocerciasis)

Bacterial Diseases
- Brucellosis
- Shigellosis
- Leptospirosis
- Leprosy
- Plague
- Louse-borne relapsing fever
- Yaws
- Typhoid and Paratyphoid fever

Rickettsial Diseases
- Louse-borne epidemic typhus fever
- Murine typhus fever
- Tick-borne Kenya fever

Viral Diseases
- Zika and Bwamba fevers
- Nairobi tick-borne sheep fever
- Several other Arbovirus fevers
- Yellow fever
- Hepatitis
- Rabies
- Trachoma

South Africa

Helminth Diseases
- Hookworm
- Whipworm
- Hymenolepis nana
- Schistosomiasis
- Filariasis (W. Bancrofti)
- Ascaris
- Threadworm
- Tapeworm
- Fascioliasis
- Trichuriasis

Bacterial Diseases
- Brucellosis
- Shigellosis
- Cholera
- Leprosy
- Plague
- Yaws
- Typhoid and Paratyphoid fevers

Rickettsial Diseases
- Murine typhus fever
- South African tick-borne typhus

Viral Diseases
- Multiple Arbovirus Fevers
- Rift Valley fever
- West Nile fever
- Hepatitis
- Rabies
- Trachoma

Southwest Asia

Helminth Diseases
- Hookworm
- Whipworm
- Tapeworm
- Ascaris
- Threadworm
- Strongyloidiasis

Protozoan Diseases
- Malaria
- Cutaneous Leishmaniasis
- Amebiasis

Rickettsial Diseases
- Epidemic typhus
- Murine typhus
- Scrub typhus

Viral Diseases
- West Nile fever
- Naples and Sicilian
- Phlebotomus fever
- Sindbis fever
- Hepatitis
- Rabies
- Trachoma

Central South Asia

Afghanistan, Bangladesh, Bhutan, India, Sri Lanka, Tibet, Southeastern Russia

Helminth Diseases

- Hookworm
- Whipworm
- Tapeworm
- Paragonimiasis
- Fascioliasis
- Filariasis (W. Bancrofti and malayia)
- Ascaris
- Threadworm
- Hydatid disease
- Hymenolepis nana
- Schistosomiasis

Protozoan Diseases

- Amebiasis
- Cutaneous Leishmaniasis
- Leishmaniasis (Kala-azar)
- Malaria (uncommon)

Bacterial Diseases

- Brucellosis
- Shigellosis
- Leptospirosis
- Tick-borne relapsing fever
- Louse-borne relapsing fever
- Typhoid and Paratyphoid fever
- Cholera
- Leprosy
- Plague

Rickettsial Diseases

- Louse-borne typhus fever
- Boutonneuse fever
- Scrub typhus fever

Viral Diseases

- Naples and Sicilian
- Phlebotomus fever
- Sindbis and West Nile fever
- Dengue 1 and 4 fevers
- Kyasanur fever
- Tick-borne Hemorrhagic fever
- Japanese B Encephalitis

Fungus Diseases

- Tinea favosa
- Tinea Umbricata
- Maduromycosis
- Rhinosporidiosis

Southeast Asia

Burma, Brunei, Indonesia, Singapore, Portuguese Timor, Thailand, Vietnam, and Philippine Islands

Helminth Diseases

- Hookworm
- Whipworm
- Schistosomiasis (Japonicum)
- Gnathostomiasis
- Tapeworm
- Eosinophilic Meningitis
- Fasciolopsiasis
- Paragonimiasis
- Sparganosis
- Hymenolepis diminutia and dipylidiasis
- Filariasis (W. Bancrofti and Malayia)
- Ascaris
- Threadworm
- Creeping eruption
- Clonorchiasis (fluke)
- Echinostomiasis
- Tropical Eosinophilia
- Hydatid disease
- Opisthorchiasis
- Hymenolepis nana

Protozoan Diseases

- Amebiasis
- Malaria

Bacterial Diseases

- Brucellosis
- Shigellosis
- Cholera (very common)
- Leptospirosis
- Plague
- Typhoid fever (common)

Rickettsial Diseases

- Scrub typhus fever

Viral Diseases

- Japanese B Encephalitis
- West Nile fever
- Dengue fever
- Sindbis fever
- Chikungunya fever
- Viral encephalitis
- Hepatitis
- Rabies