

Helping Missionaries Start Healthy And Stay Healthy



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Physical Health Risks

The last 100 years have seen a radical improvement in the health risks associated with missionary service. A century ago, the health risks were high, and fatalities were common. Of the 133 missionaries sent out prior to 1915 by the Free Presbyterian Church of Scotland, 20% died (McCracken, 1973), and it was usual for missionaries to take their own coffins as they sailed away from the UK. West Africa became known as “the white man’s grave,” a description that ignored the fact that it was also the African’s grave to the same or a greater extent. Missionaries and volunteers were exposed to the appalling health risks of a tropical climate, without the protection of vaccines or anti-malarial prophylaxis and treatment, and they paid a heavy price.

Tropical location health risks decreased after the advent of potent anti-malarial treatments and effective vaccines in the middle of the last century. The first vaccine to be used extensively was smallpox at the beginning of the 20th century, at which time 1,500 deaths occurred from this dreadful disease each year in the USA alone. Worldwide campaigns resulted in the eradication of smallpox in 1977. Typhoid vaccine was first used in British troops in the Boer war and more extensively during World War I. BCG for tuberculosis was first introduced in France in 1920, and since

In this chapter, we review ways in which physicians, acting as medical officers for mission agencies, can help ensure that candidates at selection are medically fit for their work. Physicians can also confidently reassure serving missionaries that they are fit to continue on the field. Experience and staying updated in tropical and travel medicine are essential.*

* The reader is referred to two chapters in the recent *Textbook of Travel Medicine and Migrant Health*. This book includes a helpful chapter by one of the authors on “Psychological aspects of travel and the long-term expatriate” (Jones, 2000) and a chapter by Dr. Ted Lankester on “Health screening and psychological considerations in the returned traveler” (Lankester, 2000).

then 3 billion doses have been administered worldwide. Diphtheria vaccine was introduced into general use in 1938, whooping cough vaccine in 1948, polio vaccines in 1955, measles vaccine in 1968, meningococcal A and C vaccine in 1969, hepatitis B vaccine in 1981, and hepatitis A vaccines in 1992.

These advances had a marked impact on mortality risks. Between 1945 and 1970, Protestant missionaries from the USA had an overall death rate 40% lower than for a US control group, despite the fact that infectious disease risks were still about 50% higher, initially mostly due to poliomyelitis in non-vaccinated individuals and malaria (Frame, Lange, & Frankensfield, 1992). However, non-infectious disease risks have also changed, and between 1958 and 1970, American missionaries were 50% more likely to die of accidental death in Africa than if they had been in the USA.

Gaps remain in the current range of vaccines, most notably for potentially lethal and common infections such as dengue fever. The risk of acquiring TB has increased significantly (Cobelens et al., 2000) and now approaches that of hepatitis A without vaccination. BCG protects against severe forms of TB, but it is by no means an ideal vaccine, and there is no reliable way of assessing how effective it has been in stimulating cell-mediated immunity, which is important in protection against acquiring TB. Skin tests are only a partial guide.

Hepatitis B remains an under-recognized risk. In the missionary cohort, the major transmission risk is via minor contact with carriers. This may involve only tiny quantities of body fluids, i.e., not sexual and not vertical from mother to child (Van Damme et al., 1995). The risk is greatest for pre-adolescent children (Davis, Weber, & Lemon, 1989). One study of American Protestant missionaries estimated an overall hepatitis B annual attack rate of 4.2%, with overall post-service evidence of infection in 26% (Lange & Frame, 1990). Unsafe injections for those receiv-

ing health care overseas are an additional hazard. The World Health Organization (WHO) estimates that 12 billion injections are given worldwide each year, with 95% administering drugs rather than vaccines. Many of these are given without adequate sterilization of injection equipment. WHO estimates that 60% of hepatitis B prevalence in India and more than 40% in Egypt may be transmitted in this way, resulting on a global basis in 1.3 million deaths annually (WHO, 1999). All missionaries serving in areas where hepatitis B is common, including Eastern Europe, should be vaccinated, whether or not they are involved in health care work.

The advent of HIV infection two decades ago has added an entirely new risk factor, particularly for health care workers, among whom we are likely to see an increasing number of HIV infections. A tragic example was Joy Bath, an Elim Pentecostal missionary working in Zimbabwe, who contracted HIV as the result of blood splashing onto a wound on her foot in a labor ward and who died four years later in 1995 (Stokes, 1995). It is a fact of missionary life that some workers expose themselves to HIV risk through extramarital relationships, including relationships with commercial sex workers who, in both Africa and Asia, have very high rates of HIV prevalence. I have seen more than a dozen missionaries who have placed themselves at risk, and in one case HIV infection resulted.

Malaria went into decline in many developing countries as the result of colonial era mosquito control measures, but altered financial priorities after independence, a retreat from the use of DDT, and climate change have all contributed to a worldwide resurgence. These factors have unfortunately coincided with the advent of multiple-drug resistance. In Africa, chloroquine and proguanil, which for many years were the mainstays of protection for long-stay expatriates, are decreasingly effective. The current alternatives are either horrendously expensive or have infrequent but potentially serious adverse

effects. It is quite possible that the future logical choice of anti-malarial medication in some areas of very high malaria transmission may cost a missionary agency £2,000 annually for a family. Malaria has returned to its former position as a potentially lethal threat to the life and health of missionaries and volunteers.

In the last quarter century, road traffic accidents (RTAs) have emerged as the leading cause of death, and frightening statistics of the deaths and injuries that occur in many developing countries were published 10 years ago (Smith & Barss, 1991). As one example, the fatality rate per 10,000 vehicles was 70 times greater in Nigeria in 1978 than in the USA. Dutch researchers have noted an increased mortality among development workers, double that of the general Dutch population, with RTAs being the leading cause of death (Schouten & Borgdorff, 1995). Murder and death during burglary now occur with disturbing and increasing frequency. A recent survey of deaths in humanitarian workers concluded that humans with weapons now pose a greater threat than motor vehicles and that both veterans and inexperienced workers are at risk (Sheik et al., 2000).

Psychological Health Risks

Even a cursory examination of the last two centuries of missionary enterprise reveals the uncomfortable fact that some eccentric individuals played a significant role in missionary endeavor. God honored their commitment and blessed their work, but a significant cost was borne by their colleagues and families, alluded to by Tucker and Andrews (1992). Those who did not make the headlines also had problems. About 90 years ago, Price (1913) analyzed over 1,000 missionaries working with the Church Missionary Society between 1890 and 1908. He found that 40% did not persevere with their assignments. In two-fifths of the cases, the problem was due to mental health issues. Much more recently, Peppiatt and Byass (1991) found

an 11% risk of psychiatric disorder in a study of 212 Methodist personnel. Why is missionary service associated with detectable and sometimes significant psychological problems? It is due to a combination of the characteristics of both soil (the new environment) and seed (the character of the missionary). We now look at issues concerning the new environment.

The New Environment

Adaptation to a new culture is stressful. Culture shock, the term often still applied to the early stages of the process of cultural adaptation, was first coined by Oberg (1960), but it is only the first stage in a transitional process which may take several years to complete. Missionaries start their journey as monocultural beings and usually finish as adapted bicultural people. Oberg identified four stages. The fascination with the new country in the first few weeks gives way to hostility and aggression in the second stage, followed by a third stage of partial acceptance, during which a sense of humor re-emerges. In the final fourth stage, the immigrant operates in his/her new world without a feeling of anxiety, accepting the customs of the country as another way of living with enjoyment. Adler (1975) called the stages of cultural adaptation contact, dis-integration, re-integration, and autonomy. Hiebert (1985) in his book *Anthropological Insights for Missionaries* describes the stages as tourist, disenchantment, resolution, and adjustment.

For all who make cross-cultural transitions, the changes will be, to some extent at least, unpredictable. For most missionaries, the changes are voluntary, and there is therefore strong motivation to work through them. For some family members, however, the transition to a new culture may be involuntary. Family members with a clear sense of their own identity and a desire to make their own choices may experience considerable difficulty if they have not been party to the decision making process. This is especially true for adolescent children and spouses who are

unwilling migrants, attempting to follow obediently in the steps of their parent or marriage partner. Transitions that are both involuntary and unpredictable are inherently more stressful (Hopson & Adams, 1976).

Elements of bereavement also come into the picture (Bowlby, 1984; Huntington, 1984; Parkes, 1972). Leaving one's home country on a longer-term basis necessarily involves varying degrees of loss, depending on personal circumstances and motivation. Where the loss is deep, a bereavement reaction will follow, which will affect functioning in the new environment.

Beyond the basic stresses of cultural adaptation, there are chronic cumulative stresses, and sadly and all too often, there are serious traumas which cannot be avoided (De Haan, 1997; Foyle, Beer, & Watson, 1998). In one study of missionary personnel, 17% of those interviewed were suffering from stress reaction (Foyle, 1991). The extent of stress reaction may vary from mild fatigue and loss of enthusiasm for work to severe exhaustion, escalation of personal conflicts, and major depressive and anxiety symptoms with suicidal ideation (Richardson, 1992).

Those working in locations with high stressor exposure and few possibilities for escape soon become ineffective helpers for those they have come to serve. In a survey of 1,300 people who had worked with the International Committee of the Red Cross (ICRC) and who were returning to their home countries, 10% were diagnosed as suffering from stress reaction. Stress was defined as *basic* (including initial culture shock, cultural adaptation, and chronic additional stressors not present in the home environment) in a quarter of the stressed cohort. It was *cumulative* (characterized by prolonged exposure to minor foreseeable traumas) in half, and it was *traumatic* (characterized by sudden, unpredictable, and involuntary psychotraumatic events) in 17%. Post-traumatic stress disorder (PTSD) was less common but was present in 7% (De Haan, 1997). The considerable frequency with which these stressors im-

pact missionaries indicates that the wise agency will attempt to select those individuals who have the psychological resilience to cope. It is not just a question of being tough minded but of having the flexibility to rework a strategy in response to the changes which are encountered.

Candidate Selection

There is good evidence that factors which make breakdown during overseas service more likely can be identified during the screening interview of prospective missionary candidates. It is not just the stressor exposure level but also individual vulnerability which determines outcome (Harrison, 1991). On the positive side, Howes and Kealey (1979) suggest that there are characteristics which make potential expatriate workers more resilient, and Lazarus and Folkman (1984) have emphasized that the response to the stressor has important implications regarding the outcome. The following case study illustrates the interplay of the two factors:

Ruth was a single nurse, aged 35, who worked in an isolated refugee camp, where she faced a high mortality rate and huge work pressures. She had generally coped well in the UK, but after several months working in the refugee camp, she started to react to her line manager, Susan, with frequent angry outbursts, which destabilized their relationship. It became clear that Ruth was unable to cope in the pressured environment of the camp, and the recommendation was made to terminate Ruth's contract prematurely.

During a personal review, Ruth confided that Susan reminded her of her mother, who had rejected her at age five when her twin brothers were born. Soon after their birth, Ruth had become ill and had had a prolonged admission to the hospital, during which her mother did not visit. Ruth still nursed considerable resentment towards her

mother. These factors had not been identified or explored at Ruth's screening interview, and no opportunity to work through these feelings had therefore been offered.

In different circumstances, Ruth might have coped, but it was the combination of unresolved childhood issues and high stressor exposure which led to premature repatriation. Prevention is better than cure. Ideally, Ruth should have had her childhood issues identified at the initial interview. She should have been offered counseling help if she felt she could benefit from it at that stage, and she should have been assigned to a less stressful location, where adequate escapes and supportive relationships were combined.

The Candidate's Psychological Health

Candidate screening is in essence a risk assessment procedure. It aims to exclude the few individuals who will not cope with cultural adaptation, who may be harmed by expatriate life, or who may traumatize others. The screening process also identifies individuals who have attributes that prompt assessors to believe that they will be inter-culturally effective and can be considered "within normal limits," but they have some attributes that also cause some concern. The wise agency will continue to mentor their missionaries throughout their cycle of service to enhance their effectiveness.

The whole screening process, both the interview and the completion of psychometric scales, will be affected by performance bias (wanting to be seen in a favorable light). The confirmatory views of referees, particularly work colleagues, are thus vitally important. Most assessors find that a selection of psychometric scales assists understanding how the applicant functions psychologically, but scales should never be read in isolation and should be interpreted in the context of hearing the candidate's personal story first hand. Candidate strengths must also be assessed and emphasized.

Important issues to be clarified include personal and family history of mental ill health, including both first- and second-degree relatives. Childhood experiences should be explored. How does the candidate perceive the quality of parenting? Were there elements of emotional deprivation which are still functioning in adult life? Was there abuse or serious trauma? A useful and revealing question suggested by experienced missionaries is, "*Is there anything about your childhood which you would change if you had the opportunity?*" (Geoff and Dee Larcombe, personal communication).

How has the applicant coped with stressful situations in the past? Is he/she able to identify a personal style of reaction to stress? If a previous stressful situation was not handled well, what would he/she do differently next time? Sensitive areas include past sexual orientation and the likely future behavior pattern, past alcohol abuse and drug use, marital difficulties, and, for parents, reasonable solutions to the problem areas of child rearing.

"Difficult people" are a common source of stress in expatriate working groups, and in many cases the difficult person has an unhelpful personality trait or a personality disorder. Usually the person with the disorder blames everyone else for the difficulties, and the underlying cause of the conflict only emerges after interviewing a number of stressed individuals who interact with the key figure, the "problem center." It is vital that the cause of relationship stress be accurately identified if appropriate management decisions are to be made. All too often, one or two stressed individuals are repatriated because it is assumed that they are the ones who cannot cope with the pressures of expatriate life. The main or at least a contributing cause, however, can be another staff member who is allowed to continue in post and who will create problems for the next raw recruit. Organizational dysfunction may also mask the problem. The agency may not wish to confront the "problem center" and may find it more

convenient to lay the blame for the relationship difficulty at the door of others.

The concept of personality disorders is well accepted in psychiatric practice, although definition is beset with difficulty. The World Health Organization (1992, pp. 198-224) defines these conditions as deeply ingrained, enduring behavior patterns manifesting with inflexible responses to a broad range of personal and social situations. Individuals with a personality disorder tend to be maladaptive, inflexible, and impaired in social and occupational functioning, and they tend to leave an indelible, negative, and often painful mark on their relationships with others. The prevalence of personality disorders in the general population ranges from 2% to 13% (Marlowe & Sugarman, 1997), so it is inevitable that individuals with these disorders will surface among people working overseas.*

John, whom I saw with a colleague a few years ago, was an example of a selection success, even though the decision was negative:

A single male aged 40 years with a personal history of mild depression, John had lived during childhood in fear of his father, and as an adult he owned to great difficulty in sharing his feelings with others. His brother was schizophrenic, and John was socially isolated, enjoying solitary activities. His NEO Five Factor Scale (Costa & McCrae, 1990) demonstrated high neuroticism, marked introversion, and very low scores for openness, agreeableness, and conscientiousness. These results and the general impressions gained during assessment were discussed with John. After reflection, he decided he was unsuitable for the intended location and decided to withdraw his application to the missionary agency.

The Candidate's Physical Health

The candidate medical examination aims to answer the question, "*Is this individual physically fit for work in the environment to which he/she intends to go?*" Physical health screening should be performed, at least in part, by physicians with personal experience of working in developing countries or with specific training in travel medicine. Nurses trained in travel and tropical medicine have an important role in advising on anti-malarial prophylaxis and vaccinations. However, because they are not trained in a sufficient breadth of symptom interpretation, they need the help of medical colleagues for the physical examination of candidates. All candidate assessment is about risk assessment, and agencies need to be aware that no matter how detailed a candidate medical review may be, some unexpected problems are bound to occur.

Over the last couple of years, I (Michael) have seen two medical repatriations. The first one looks as though it may prevent the family from ever returning to the field. A male missionary with very minor palpitations developed serious instability of heart rhythm that has only been partially solved by catheter treatment. The other case is a young mother with a heart condition that caused a serious complication but that remains completely silent on examination by a cardiologist and was only diagnosed after very sophisticated diagnostic procedures.

At least 45 minutes should be allowed for the medical examination of candidates. Some physicians use written symptom questionnaires completed by the candidate prior to history taking, but these may actually increase the length of time it takes to do the assessment. Some feel that questionnaires give focus to an exchange that has to cover a lot of material in a short period of time. There may be a danger, if

* For further reading, see Esther Schubert's (1991) excellent article, in which she applies a three-cluster classification to personality disorders and their impact in expatriate groups.

questionnaires are used to shorten the process, that some issues may be glossed over by time-pressured assessors. Some candidates attempt to cloak important aspects of medical history to enhance the possibility of passing the medical review, and the non-verbal responses to questions may provide vital clues. A medical history should be detailed, covering volunteered current symptoms and a full systematic inquiry. Symptoms should be assessed in the context of the intended destination. The foothills of the Himalayas may not be the best destination for someone with osteoarthritis or significant back problems, but the same person may function well in a less physically demanding location.

Clear contraindications would include conditions like ulcerative colitis with a relapsing remitting course, and unstable angina. Relative contraindications include chronic medical disorders, poorly controlled diabetes or epilepsy, coronary artery heart disease, and abnormality of the heart valves. Some conditions, for instance epilepsy or psoriasis, may worsen if particular anti-malarial prophylactic drugs are used. Seizure control may deteriorate with chloroquine or mefloquine, and alternatives may be prohibitively expensive, much less effective, or unsuitable for long-term use. Asthma, which is well-controlled and has not resulted in hospital admission in the last few years, is not a cause for concern, since in most instances asthma will improve in a different environment with a different pattern of allergens. An important part of the medical review is the detection of previously undiagnosed problems that might become serious and pose a danger to health during service. For instance, anemia and biochemical evidence of iron deficiency suggest chronic blood loss; in post-menopausal women and men over 50 years, a hidden large bowel cancer may be the cause.

Physicians will vary in their choice of screening investigations, and here there are some differences between the UK and North America. A full blood count would be considered normal on both sides of the

Atlantic, whereas an erythrocyte sedimentation rate (ESR) is now frowned on in North America. Renal and liver function tests should be performed. The necessity of doing blood lipids can be determined on the basis of family history and age. The storage of serum for later tests is wise. We would add thyroid function, prostate specific antigen, ECG/EKG for heart problems, and mammography for breast cancer, dependent on history, age, and physical examination findings. Some agencies require HIV antibody tests, although we take the view that a careful history and examination, plus the storage of serum which can be tested later, are generally adequate.

In North America and the UK, routine chest radiography is not considered to be necessary. North American physicians will probably wish to perform Mantoux tests (skin tests for TB) in most candidates, whereas in the UK, chest physicians regard a good scar at the site of BCG vaccination as adequate evidence of immunity. Further Mantoux tests are considered unnecessary, unless a candidate is scheduled to perform health care work in a highly TB endemic area. In North America, missionaries will not usually have BCG before travel abroad, but they will have a Mantoux performed prior to departure and on each subsequent home leave. Similarly, in the US mammography will be requested on women over the age of 40 years, in Canada over the age of 50 years, and less often in UK (Mittra, Baum, Thornton, & Houghton, 2000). Assessors on both sides of the Atlantic should be aware that medical fashions differ, and there is no right or wrong approach. All candidates heading for the developing world should have their blood groups ascertained, irrespective of age.

Do healthy children need blood tests prior to travel? Different opinions are held, but there are solid grounds for determining blood groups for all ages. In the event of an accident in a highly HIV endemic country, knowing the blood group will speed up the process of identifying a safe donor, either a parent or other members of a safe donor pool. The blood groups of

children are not normally determined by maternity hospitals, unless there are complications at birth. We find that the “trauma” of blood tests can be minimized by using local anesthetic cream and slender butterfly-type infusion needles for all children up to 10 years and older children who wish it. While taking the sample for a blood group, it makes sense to do a full blood count and any other tests that examination or history suggests are important, since a slightly larger volume in the syringe makes little difference to the trauma of the procedure. The presence of an experienced nurse is a huge advantage, since some parents manage to communicate high levels of anxiety even if they appear calm, and most are not used to holding their children firmly. It should be noted that these children are, in any case, going to countries where blood tests to detect malaria may need to be performed when they are ill and in strange surroundings, and all children will face several episodes of needle contact with pre-travel vaccinations. In this context, a venupuncture, competently performed, does not constitute unacceptable extra trauma.

Physical Health Screening for Returning Missionaries

Normally one hour should be allowed for the medical examination of adults returning from the mission field and 30 minutes for children, although frequently adults need somewhat longer. They may come with a list of problems which they have allowed to accumulate because local medical facilities are poor, producing what amounts to a shopping list of minor or major problems which need attention. A medical history should include asking all missionaries about sexual relationships. It is very unwise to make assumptions at any age. Missionaries are human and make mistakes, sometimes with tragic consequences. It is entirely normal for

doctors to experience reservation or feel awkward about inquiring into personal and private areas when taking a medical history. However, the implications of HIV for current and future health and relationships are so important that it is vital that all expatriates be asked about aspects of behavior which may have placed them at risk of infection. As an absolute minimum, we suggest that all returning expatriates be asked, *“Do you have any concerns about HIV transmission?”* In addition to asking about potential non-sexual routes of transmission, most patients should also be asked, *“Have you had any sexual contacts other than your regular partner/wife/husband while you have been abroad?”* *

Some missionaries work in areas of very high HIV prevalence. Even if not involved in health care work, they may have given assistance to the victims of road traffic accidents, or they may have received health care in medical facilities where sterilization procedures are less stringent than in their home country. Pretest discussion and performing an HIV antibody test may remove a huge burden of anxiety. Several years ago, a young woman attended my clinic in the UK for tropical screening following a two-year assignment with an aid agency. When asked whether she had had any sexual partners while in Africa, she hesitantly said, “No,” then tearfully related that she had been raped on a train in Central Africa. A man in the restaurant car had misinterpreted their friendly conversation over the dinner table as a sexual invitation and had raped her in the sleeping compartment. An HIV antibody test was fortunately negative. This woman would have remained worried and untested if the question had not been asked.

Our strong preference is to conduct the medical examination prior to a personal review session with another staff member who has counseling skills and who is able to conduct this aspect of the leave medi-

* For a detailed review of the issues surrounding HIV infection and missionaries, see Jones (1999).

cal review in a relaxed and comfortable environment. Important functions of the leave medical examination are:

- To reassure both the sending agency and the missionary that the missionary is well enough to return to the field of service (a few extra investigations buy a significant increment of reassurance).
- To safeguard the financial investment of the sending agency in the missionary.
- As an expression of the value of the missionary to the agency.
- To detect pre-symptomatic chronic medical conditions, which otherwise might precipitate urgent repatriation during the next tour.
- To ensure that any vaccine boosters are given.
- To review anti-malarial prophylaxis.
- To modify medical risk behavior (e.g., swimming in African lakes) or sexual activity that places the missionary at risk.
- To identify significant stressors and advise assistance for stress management and the handling of problematic relationships.

Laboratory Tests

For the benefit of doctors and nurses who may read this chapter, we suggest a wider range of tests is indicated in returning expatriates and should include the following:

- *On all*, do ESR, FBC including eosinophil count, renal function, and hepatic enzymes.
- Add microscopy on a single stool specimen for asymptomatic travelers from developing countries. For those with symptoms, a culture should be reserved, and in such travelers three stool specimens should be sent.
- Add schistosomal serology for any missionaries who have been in direct contact with lake or slow-moving river water in Africa, China, or the Philippines.
- Add strongyloides serology if an eosinophil count is raised.
- Add a filaria ELISA for West and Central Africa.

Divergent views have been expressed regarding the value of screening expatriates returning to their sending countries after periods of service abroad. A large study of over 1,000 people without symptoms seen at the London Hospital for Tropical Diseases (Carroll et al., 1993) found abnormal laboratory results in 25%, about one-fifth with other evidence of parasitic infection, and abnormalities on physical examination in one-third. Many of the parasitic infections would have cleared spontaneously. The authors felt that physical examination added little to practical management, concluding that screening for tropical disease can be carried out by an informed health care worker using structured history taking and relevant lab tests, including HIV test discussion and antibody tests for schistosomiasis (bilharzia) for African lake swimmers.

We take a different view for several reasons. Firstly, in this study, some patients who were classified at the outset as not having symptoms were later found to have significant symptoms and were then excluded from the analysis (C. Dow, personal communication). Second, some patients who appear healthy because they do not volunteer symptoms still have important underlying health issues, which will emerge during a medical consultation. Selective screening of expatriates implies strong background knowledge of geographic aspects of disease. Without this background knowledge, selective screening may erroneously exclude some from more extensive assessment who definitely need it (MacPherson & Kozarsky, 2000). The study also does not address those medical disorders which are age related. Young children are more prone to acquire parasites and other infections than adults. Those who pass the age of 50 years will also be more prone to age related health problems. We agree with Ellis and others that travel should not be over-medicalized (Conlon & Peto, 1993; Ellis, 1993). However, the missionary cohort tend to spend longer overseas than other expatriate groups, tend to integrate more deeply

with the host culture, and often work in areas with higher health risks than the average expatriate. Extra care is therefore appropriate.

A physician's chosen model of medical practice will also influence his/her attitude to routine screening by infectious disease physicians. We know that the *raison d'être* of such specialists is the identification of infectious disease, and most of us in this specialty are a little disappointed when patients are referred with potentially infectious disorders and we fail to find a cunning microbe. However, while identification and diagnostic skills are invaluable for those who screen expatriates, the use of a broader, occupational health model is crucial.

Problem Areas in the Medical Examination of Missionaries

In light of the points identified above, the likelihood of being able to complete an examination in 60 minutes may appear small. For the doctor, there are significant problem areas. Whether or not the examining physician is the family doctor for the missionary family, he/she may only have one look at each family member. We term this challenge "snapshot medicine." Frequently the clues are to be found in "soft" signs that can be easily dismissed as being of no consequence or missed by those who do not know what to look for. For example, seborrheic dermatitis, a mild skin fungal infection, and oral thrush under a denture may indicate underlying HIV infection. Glandular fever virus infection in someone with HIV infection may produce filmy vertical white streaks on the edges of the tongue (oral hairy leukoplakia), which is almost always a reliable sign of HIV infection. It may be missed unless the tongue is not only protruded but also waggled from side to side.

Some years ago, I (Michael) saw a returning missionary who at examination had two abnormal physical signs: a mildly raised pulse rate and a cardiac murmur. She did not have sweaty palms, a fine finger tremor, or the eye signs of an over-

active thyroid gland. Because I was concerned about the presence of the murmur, I asked her family doctor to refer her to a cardiologist. By the time this had been arranged several months later, the physical signs were much more obviously those of an overactive thyroid. Thyroid function tests confirmed this and provided a more-than-adequate explanation for the murmur and the raised resting pulse rate. With the benefit of hindsight, I would now order thyroid function tests in any patient with these minimal signs. It was an important diagnosis to make, and the woman would almost certainly have been repatriated from the field in a much worse state of health, if she had returned overseas without this condition being identified.

Problems in this pre-symptomatic phase at medical review that are missed or underestimated may cause major difficulty after return to the field, as the following story illustrates:

David was a 43-year-old missionary working in West Africa. At detailed review in the UK, it emerged that fresh water contact made the possibility of the bowel form of schistosomiasis (bilharzia) likely. He was mildly anemic and had traces of blood in his feces. These results were sent to his family doctor, who later referred him to a surgical clinic after David also developed intermittent abdominal pain. The surgeons performed an ultrasound examination of his abdomen, which was normal. They also performed a colonoscopy, but the instrument could not be advanced through the entire colon.

David was considered clear of serious causes for his chronic blood loss and returned to West Africa, but three months later he was repatriated with severe anemia. At laparotomy, a colonic cancer was found in the segment which the surgeons had not been able to visualize. This was resected, and despite its relatively advanced stage, David thank-

fully remains well with no signs of recurrence 10 years later.

Fatigue in Returning Missionaries

Fatigue may be difficult to interpret. Missionaries may simply be travel weary or jet lagged if seen within a few days of arrival in their home country, or they may be depressed. Debbie Lovell (1997) found that 40% of aid workers reported “depression” occurring either during or after service. In missionaries making their final return to their home country, tiredness may be a symptom of bereavement, although usually there will be other clear features, as illustrated below:

A 60-year-old missionary returned after a lifetime of service in an African country, where she had also grown up as a missionary kid. She was unwisely advised to make a clean break with the past and arrived in the UK with a couple of suitcases and little to remind her of her life’s work. She had only a few aging relatives and found that being in the UK carried no sense of being at home at all. At medical review, she was generally fatigued but was also disturbed to find herself bursting into tears for no apparent reason. She found it difficult to speak at public meetings, because she was not sure that she could retain emotional control.

At interview, it was clear that she was experiencing classical bereavement symptoms, having lost a great part of her personal identity in leaving her adopted country. We advised that she be exempted from the public speaking commitments with which she did not feel able to cope, encouraged her to enlarge photographs she had taken in Africa to decorate her new flat, and encouraged her to talk about the life that she had left behind in an environment where she felt safe and accepted. The opportunity developed

for her to return to work for another year in the same country. During this additional tour, she was able to adjust to her final departure with much greater ease, this time returning with important physical reminders of her life’s work.

Chronic fatigue syndrome (CFS) is not uncommon in the missionary cohort. The old term of myalgic encephalomyelitis (ME) is no longer used and is misleading, since it implies an inflammation of the nervous system, of which exhaustive research has failed to find any evidence. Nor is there any reliable evidence of chronic viral infection. While some patients become ill with CFS after viral illnesses, it may follow bereavement or trauma, suggesting a variety of precipitating factors. CFS tends to attract strongly polarized views, and a balanced attitude will include the possibility that some patients have unidentified physical causes, while psychosocial factors predominate in others. At the turn of the 20th century, 20% of missionaries were repatriated with symptoms that now sound very similar to modern definitions of CFS. Repatriation was more frequent among those working in Japan than those working in China, India, or Africa.

More recent research suggests that CFS is quite common in expatriates (Lovell, 1999). I (Michael) have the impression, unsupported by clear data, that CFS clusters in certain types of missionary activity, and this may reflect the personality structures of those attracted to this kind of work. When physicians have seen large numbers of such patients, they become aware that the invalid or disabled role is one that may have positive benefits and may even achieve a strong degree of control over others or over the working environment. It may prevent posting to a less desirable location, or it may act as a magnet for the support of others with whom the patient relates closely. I have gained the impression that personal insight among missionary patients with CFS is sometimes limited, and the gains from ill-

ness, which may be apparent to an outside observer, are often denied by the sufferer (Jones, 1996). Lovell (1999) found an open attitude towards causation among her patients, and she noted that expatriates with CFS tend to be hard working, to have an overactive pre-morbid lifestyle, and to have experienced stressful life events in the period leading up to the onset of CFS.

Several medical conditions may present with fatigue as a symptom, including anemia, hepatitis, intestinal infections with single-cell organisms such as amoebiasis, giardiasis, bacterial infections such as brucellosis, and worm infections such as schistosomiasis. These should be excluded before the label of CFS is applied, but most of these may also act as trigger factors for CFS. A recent study by workers at the London Hospital for Tropical Diseases demonstrated that tiredness is the most common symptom in schistosomiasis, occurring in 50% of those with confirmed infection with this fluke (Whitty et al., 2000).

Trauma

Personal violence is more likely in the developing world than in the developed West, due to both war and criminal activity. Some organizations like ICRC have seen a transition over the last decade from their workers being relatively protected from personal violence to being deliberate targets. Sometimes those who have been quite seriously traumatized will volunteer nothing about what has happened, but they may disclose more on direct, sensitive questioning, as the following case history demonstrates:

A 30-year-old man was sent by his family doctor to my tropical clinic for screening for schistosomiasis. Due to a cancellation, I had more time available and ascertained during history taking that all had not gone well on his last trip. He had been the leader and truck driver of an overland safari. The convoy was held up by bandits,

wholesale robbery ensued, and young women were raped in front of their companions, while all were threatened with death by machete. The trauma extended beyond the initial incident, as the man subsequently arranged for the hospitalization of the rape victims and post-exposure anti-HIV drugs to be flown from another country. He was still disabled by deep anger and accepted the offer of time with a staff counselor.

Mixed Pictures

Sometimes it is very difficult to sort out the relative contributions of contributory factors. In the following case history, there were personnel management deficits in the expatriate community, anti-malarial prophylaxis was not being wisely handled, and post-traumatic stress disorder intermingled with a serious tropical virus infection to cause repatriation.

Sam was a 50-year-old pilot working in Asia. He had operated a light aircraft service in a developed country, but after arrival in Asia he experienced difficulty integrating with other expatriates, who treated him as an inexperienced junior missionary despite his wealth of flying experience. The first traumatic incident was the serious illness of his wife, who developed cerebral malaria. Sam attempted to fly her to the hospital, but as he was taking off, a tire burst and he slowed to a halt, narrowly avoiding crashing. He had a further near-fatal aircraft incident a few months later. While flying over difficult terrain, he heard a loud explosion from his engine. His passengers were church leaders who realized that the situation was serious, and they began praying fervently. Sam was certain he would crash, but the engine kept running despite oil pressure registering zero. The engine continued to run until he reached an airstrip,

where he landed safely. When he inspected the engine, he found that a cylinder head had blown off.

Some months later, Sam had an illness with fever and crippling joint pains that persisted for months afterwards. He also started to have disturbing dreams with flashbacks reliving the trauma. The clear primary diagnosis was PTSD, and primary management comprised counseling. The joint pains still needed further assessment. A rheumatologist diagnosed early seronegative rheumatoid arthritis, but viral serology subsequently identified an uncommon tropical virus as the cause. Other issues that needed attention included revision of anti-malarial prophylaxis for both Sam and his wife.

Is All This Effort by Medical Doctors Worth It?

What is the evidence that thorough medical examination of returning missionaries is not a waste of time? As indicated above, medical review is not just about detection of medical disorder. It also functions to identify psychological health issues and has an eye to protection in the future with vaccines and altered anti-malarial prophylaxis. A medical student, Kirsteen Wintour, and one of the authors (Michael) are assessing the results of over 600 routine medical examinations done between 1990 and 2000. The examinations were performed under the auspices of Care for Mission (CFM) at a clinic in the Scottish Borders and after its relocation at the Elphinstone International Health Centre (EIHC) near Edinburgh. The data mentioned below are not yet finalized but are largely reliable.

The age range of the patient group varied widely, between one year and 74 years, and the mean duration of overseas service was longer than among most expatriate groups, at nine years. Of the group, 290 worked in Africa, 72 in South America, 25 in Europe, and one was reviewed after

completing a world tour on behalf of his agency. The patients were examined according to a standard protocol, including history, examination, and a battery of laboratory tests, as described above.

Abnormal results were found in 16% of samples sent to both a hematology and biochemical laboratory, and microbiologists found parasites or abnormal bacteria in 9% of stool samples. Examination of the urine was abnormal in 14%, and chemical tests detected blood in 2.3% of stool samples. Antibody tests on blood detected schistosomiasis in 15% of the 100 missionaries who reported exposure to suspect fresh water.

Important first-time diagnoses included HIV infection, pulmonary TB, malaria, strongyloides infection, schistosomiasis, inadequately treated onchocerciasis, pernicious anemia, adult coeliac disease, chronic hepatitis C, primary biliary cirrhosis, chronic proliferative glomerulonephritis, transitional cell bladder carcinoma, prostatic carcinoma, renal calculus with non-functioning kidney, diabetes mellitus, inadequately treated sub-hypothyroidism, and hyperthyroidism. Two referrals to CFM/EIHC resulted in nullification of diagnoses made abroad of heart valve disorder and chronic inflammation of the liver, respectively.

In over 200 patients, referral to a specialist hospital service was recommended, and for one-fifth referral to more than one hospital department was recommended. In 13, the family doctor had already commenced referral following a patient consultation prior to review at EIHC, one of these for suspected (and later confirmed) breast cancer. The family doctor refused to make the referral recommended by CFM/EIHC in three cases, on the mistaken grounds that the patients were not eligible for free treatment in the National Health Service, and these patients returned to overseas service without specialist review. The most common destination hospital specialties for referrals were gastroenterology, cardiology, and renal medicine/urology. The results of hospital review were

only available in 70 of the 215 referred patients, but in 52/70 (75%) referral resulted in a change in management.

To summarize, careful medical evaluation of returning missionaries, working predominantly in the developing world, yields abnormalities on clinical examination or laboratory tests, and it indicates the need for referral to specialist services in about one-third. In those for whom a hospital report was available, management was changed in three-quarters.

Conclusion

Medically speaking, missionary service is far safer in the early 21st century than in the early 20th century. Some physical health risks are becoming more common, and deaths from RTAs or violence appear to be increasing. Candidate assessment needs to identify those with the physical and psychological stamina to cope in demanding environments. Such assessment should be carried out by physicians and other health care professionals with understanding, experience, and requisite skills. The evaluation of missionaries on leave needs adequate time, knowledge of tropical and travel medicine, and good clinical skills. Known problems accumulated during overseas service need attention, and the medical examination should be thorough enough to detect serious problems that are not yet causing symptoms. Personal review sessions should help to detect those with important emotional health issues. Limited research data suggest that the effort is worthwhile, and there is a significant yield of important medical problems. Those who risk much in the service of their Risen Lord deserve appropriately thorough medical care.

Reflection and Discussion

1. How thorough are the pre-field screening and furlough evaluation for medical problems in your organization? How could the screening and examination processes be improved?

2. What are the main illnesses that affect workers in your setting/region? Are there some ways to better prevent these problems?

3. Road traffic accidents (RTAs) are a leading cause of injury and impairment for expatriates. Discuss how your organization can help prevent RTAs and other types of accidents (see chapter 35).

4. What are some of the main health care books, websites, medical centers, and medical specialists that are/could be used for workers in your organization?

5. How could an organization with limited funds still provide adequate medical coverage for its personnel?

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