Resources for Beginning and Operating a Travelers’ Health Clinic*
Marc Shaw, Editor

* The views expressed in these articles are the views of the respective authors and do not represent any official guideline or recommendation of the International Society of Travel Medicine, its Executive Board or any of its committees.

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THE ABCs

A. Introduction
1. TRAVELERS’ HEALTH: NOW AND INTO THE FUTURE
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Medical advice for those traveling abroad has been an important source of pre-travel health information since the 1990s. Prior to this intending travelers had traditionally relied upon travel agents and Family Practitioners to dispense any worthwhile advice. Nevertheless, evidence has shown that such advice is not necessarily offered, nor is it always accurate and consistent. Thus there is a need for improvement in the sources of information in this global form of preventative medicine.

Travel Medicine is a unique specialization in health care. It is a thoroughly enjoyable field, and one where the patient (or ‘the traveler’) is enthusiastic about the anticipated trip to a new country. It is also distinctive in the way that primary healthcare physicians, nurses and pharmacists need to collaborate to keep travelers healthy and safe during their journeys.

The fun and challenge of providing pre-travel care is in the details: of the projected itinerary, of the probable type and nature of the traveling, of the possible diseases, of the potential safety and security issues, and finally of the realization that one’s task in assessing the travel is dependant upon continuing self-education in the discipline.

Each traveler provides a new collage of history versus travel health needs and the exciting part is that we, as Travel Health Professionals (THP), get to travel with them – in spirit if not in body!

Any consultation cannot be one of complacency, for the moment that that happens the next traveler will surprise you with details of their journey and just what they expect from us, as the THPs. Nevertheless, Travel Medicine is not cook-book medicine and whilst much of it can be done by protocol, there is a great deal of variation and opportunity for an unique approach, reflective of the personality of an individual practitioner, to travel health care.

For those aspiring to start a travel health service, reading this monograph will be a good start into a specialization that is very appealing. Attention to important detail required in setting up and running a clinic will enhance personal abilities to provide and maintain high standards of pre-travel care.

There are, in essence, five steps for giving travelers the foundation for healthy journeys:

i) The assessment of their health,

ii) The analysis of their anticipated itineraries,

iii) The selection of appropriate travel health advice for each individual traveler,

iv) The recommendation of required and recommended vaccinations specific to the traveler, and

v) to provide each traveler with education on the prevention and self-treatment of travel-related diseases.

The hypothesis ‘that a need for appropriate travel health advice is well established’ can best be answered in considering that of the many-million residents of industrialized nations who travel each year, any number between 20-70% will report a travel related illness, and around 10% will seek medical attention whilst abroad or upon return home.

Each year around one billion travelers cross international borders. Most travel to industrialized countries, but increasingly new and exciting destinations are being sought as folk look further a-field for adventure and excitement. Adventure travel, which is both the newest and the fastest-growing sector of the tourism industry, generally involves physical exertion in an unusual, exotic or wilderness setting. This form of travel invariably places visitors at risk for any number of environmental injuries and illnesses.
With the growth of the specialty of travel medicine over the last decade there is a need for appropriate travelers’ health and vaccination advice.

Clinics that specialize in travel health advice need to provide:

1) authoritative and current health information for those traveling overseas
2) additional resources including maps, country-specific information, and internet informatics material
3) pre-travel and post-travel clinical assistance in the prevention of disease
4) authoritative sources that provide up-to-date health information
5) an ongoing supply of vaccines adequate to meet the clinic needs for regular ‘supply and turnover’
6) policies and procedures to standardize the care a clinic gives, for all staff
7) organized medical electronic record system to document all patient (traveler) consultations and which will allow easy access to retrieve information input-ed.
8) recording of all vaccine lots administered, all medications dispensed and all adverse events
9) handouts on information given to reinforce a consultative process, and which will also record any vaccines administered and medications dispensed
10) visions for the future of the clinic and which will involve a marketing plan for clinic services

The cornerstone of travel medicine is thus the prevention of communicable disease through proper country specific health information blended with current global travel information. The information given to intending travelers must be correct, academically based, and yet practical. Whilst there is a perception that vaccinating travelers is of prime importance at travel health clinics, health education and risk assessment of the intending trip need to be a particular focus of all pre-travel consultations.

This monograph is intended to provide all intending travel health practitioners with the basis of the information needed, and the resources to access additional information.

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Spira AM. Preparing the traveler. Lancet 2003; 361: 1368-81
Leggat PA, Seelan ST. Resources utilized by general practitioners for advising travelers from Australia. J Travel Med 2003; 10:15-18
2. INTERNATIONAL SOCIETY OF TRAVEL MEDICINE’S ‘BODY OF KNOWLEDGE’ FOR THE PRACTICE OF TRAVEL MEDICINE BY PHYSICIANS AND NURSES

The field of travel medicine has grown dramatically as greater numbers of people travel to exotic and remote destinations. Approximately one billion travelers cross international borders annually. However, studies suggest that only about eight percent seek pre-travel health advice, many of whom receive information from practitioners who are ill equipped to provide current and accurate information. Travel medicine has become increasingly complex due to dynamic changes in global infectious disease epidemiology, changing patterns of drug resistance, and a rise in the number of travelers with chronic health conditions.

Why do we need a ‘Body of Knowledge’?
This Body of Knowledge was created to guide the professional development of individuals practicing travel medicine and to shape curricula and training programs in travel medicine. It is also expected to serve as a vehicle for establishing the content validity of a credentialing process.

What is a Body of Knowledge?
It is the scope and extent of knowledge required for professionals working in the field of travel medicine. Major content areas include the global epidemiology of health risks to the traveler, vaccinology, malaria prevention, and pre-travel counseling designed to maintain the health of the traveling public.

How was the ‘Body of Knowledge’ developed?
In September 1999, the ISTM Executive Board established a group of travel medicine experts from its membership to define the scope of knowledge in the field of travel medicine worldwide. The final draft of their report was converted to survey format and mailed 110 ISTM members worldwide, who were representative of the diversity within the profession. The respondents provided further input into the relative importance of each of the content areas. The results of their efforts contributed significantly to the ‘Body of Knowledge’ (I-VII) presented below.

I. EPIDEMIOLOGY
   • Basic concepts (e.g. morbidity, mortality, incidence, prevalence)
   • Geographic specificity/global distribution of diseases and potential health hazards

II. IMMUNOLOGY/VACCINOLOGY
   • Basic concepts and principles (e.g., live vs. inactivated vaccine, measurement of immune response)
   • Handling, storage, and disposal of vaccines and related supplies

Types of Vaccines/Immunizations
Indications/contraindications, routes of administration, dosing regimens duration of protection, immunogenicity, efficacy, potential adverse reactions and medical management of adverse reactions associated with the following vaccinations:

<table>
<thead>
<tr>
<th>Disease</th>
<th>Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacille Calmette-Guerin</td>
<td>Cholera</td>
</tr>
<tr>
<td>Diphtheria</td>
<td>Encephalitis, Japanese</td>
</tr>
<tr>
<td>Encephalitis, tick-borne</td>
<td>Hepatitis A</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>Hepatitis A and B combined</td>
</tr>
<tr>
<td>Human Papilloma Virus</td>
<td>Immune globulin</td>
</tr>
<tr>
<td>Influenza</td>
<td>Lyme</td>
</tr>
<tr>
<td>Measles</td>
<td>Meningococcal</td>
</tr>
<tr>
<td>Mumps</td>
<td>Plague</td>
</tr>
</tbody>
</table>

4
Pneumococcal     Poliomyelitis
Rabies             Rubella
Tetanus            Typhoid
Varicella          Yellow Fever
Zoster (herpes) vaccine

III. PRETRAVEL CONSULTATION/ MANAGEMENT

Patient Evaluation
• Relevant medical history (e.g. previous vaccinations, allergies, chronic illness)
• Evaluation of travel itineraries/risk assessment (e.g. pre-existing activities, travel to rural vs. urban areas)
• Assessment of fitness/contraindications to travel (e.g. pre-existing illness, fitness to fly)

Special Populations
Unique management issues pertaining to the following populations:
• Athletes
• Corporate travelers
• Elderly travelers
• Infants and children
• Immigrants/expatriates
• Pregnant travelers
• Travelers with chronic diseases (diabetes, chronic obstructive pulmonary disease, cardiovascular disease)
• Travelers with disabilities
• Travelers who are immunocompromised, including HIV and AIDS

Special Itineraries
Unique management issues associated with the following activities/itineraries:
• Cruise ship travel
• Diving
• Extended stay travel
• Extreme travel
• Mass gatherings (e.g. the Hajj)
• Wilderness/remote regions travel

Prevention and Self Treatment
• Travel health kits
• Chemoprophylaxis (e.g. malaria, traveler’s diarrhea, filariasis)
• Self treatment (e.g. diarrhea, malaria)
• Personal protective measures (e.g. restriction of outdoor activity at dawn and dusk and barrier protection (e.g., bed nets, insect repellents)

Precautions (and reasons for precautions) regarding:
• Food consumption
• Water consumption and purification
• Contact with fresh and salt water
• Walking barefoot
• Animal contact
• Close interpersonal contact (e.g. sexually transmitted diseases)
• Safety and security

IV. DISEASES CONTRACTED DURING TRAVEL

Geographic risk, prevention, transmission, possible symptoms and appropriate referral/triage of:

Diseases Associated with Vectors
Dengue             Encephalitis, Japanese
Encephalitis, tick-borne Filariasis (e.g. Loa loa, bancroftian, onchocerciasis)
Hemorrhagic fevers Leishmaniasis
Lyme Malaria
Plague Rift Valley Fever
Trypanosomiasis, African Trypanosomiasis, American
Typhus Fever Yellow fever
Other

**Diseases Associated with Person-to-Person Contact**
- Diphtheria
- Hepatitis C
- Influenza
- Meningococcal disease
- Pertussis
- Rubella
- Tuberculosis

**Diseases Associated with Ingestion of Food and Water**
- Amebiasis
- Cholera
- Cyclosporiasis
- Fasioliasis
- Hepatitis A
- Poliomyelitis
- Transmissible spongiform encephalopathy
- Typhoid fever

**Diseases Associated with Bites and Stings**
- Envenomation (e.g. jelly fish, sea urchin, scorpion, snake)
- Rabies

**Diseases Associated with Water/Environmental Contact**
- Cutaneous larva migrans
- Schistosomiasis

**V. OTHER CONDITIONS ASSOCIATED WITH TRAVEL**

**Conditions Occurring During or Immediately Following Travel**
Symptoms, prevention, and treatment of:
- Motion sickness
- Barotrauma
- Thrombosis/embolism
- Jet lag

**Conditions Associated with Environmental Factors**
Symptoms, prevention and treatment of:
- Sunburn, heat exhaustion and sun stroke
- Frostbite and hypothermia
- Respiratory distress/failure (associated with humidity, pollution, etc)
- Altitude sickness

**Threats to Personal Security**
Precautions regarding:
- Transportation/motor vehicle accidents
- Violence-related injuries

**Psychocultural Issues**
Unique management issues associated with:
- Culture shock/adaptation
VI. POST-TRAVEL MANAGEMENT
• Screening/assessment of returned travelers
• Emergencies and triage
• Conditions requiring referral to a specialist

Diagnostic and management implications of the following symptoms:
• Diarrhea
• Eosinophilia
• Fever
• Nausea and/or vomiting
• Skin problems
• Other

VII. GENERAL TRAVEL MEDICINE ISSUES

Medical Care Abroad
• Procedures for locating medical care abroad
• Blood transfusion guidelines for international travelers
• Limitations of standard medical coverage during international travel and alternative medical insurance for international travelers
• Aeromedical evacuation

Travel Clinic Management
• Equipment
• Supplies and disposables
• Resources for laboratory testing
• Documentation and record keeping (e.g. vaccination certificate requirements, reporting of adverse events)
• Infection control procedures
• Management of medical emergencies

Travel Medicine Information/Resources
• International health recommendations/advisories (e.g. World Health Organization and national public health organizations)
• International Health Regulations
• National/regional recommendations, including national/regional differences
• Information for travelers

Conclusion
The field of travel medicine encompasses a wide variety of disciplines including epidemiology, infectious disease, public health, tropical medicine, and occupational health. As a unique and growing specialty, it has become necessary to establish standards of practice in the field itself. These standards have been established to identify the scope of competencies expected of travel medicine practitioners, guide their professional training and development, and ensure an acceptable level of patient care.

This Body of Knowledge will serve as the basis for an examination being developed for all travel health professionals. Practitioners who successfully complete this examination will be awarded a Certificate of Knowledge in Travel Medicine by the ISTM. Information about the Certificate of Knowledge examination will be available at www.istm.org.
THE ABCs

B. General Advice
1. AIMS AND OBJECTIVES OF A TRAVEL CLINIC
Marc Shaw, Associate Professor and Medical Director, WORLDWISE Travelers Health Centres, NZ

There are few guidelines for establishing and running travelers’ health and vaccination centres. In establishing these, for each individual clinic, the following aims and objectives will assist the clinic’s directors in developing service provision:
1. To develop defined roles of medical, nursing and practice staff in the day-to-day clinic operation.
2. To develop policies, management protocols and standing orders for the Clinic
3. To improve and maintain clinic standards by a process of regular internal audits
4. To provide travelers with travel health information, travel health merchandise
5. To ensure the maintenance of standards of practice by staff within the clinic

Developing answers to a number of questions will further facilitate the organization of the clinic.

**Role of the Clinic?** Who will be running the day-to-day clinical and management levels of the clinic? What will be the parameters of its function? Will it accept referrals from other doctors? Will it accept self-referrals?

**Doctor’s job description?** What is the doctor’s role within the clinic? What will be the professional relationship of the doctor to clinical and non-clinical staff?

**Nurse’s job description?** What is the nurse’s role within the clinic? What will be the professional relationship of the nurse to the doctor, and to other clinic staff?

**Practice manager/receptionist job description?** What is the practice manager/receptionist’s role within the clinic? What will be the professional relationship of this person to the doctor and the nurse?

**Day to day function of the Clinic?** How will telephone calls be handled? How will appointments be made? How will vaccines, medications and clinic supplies be maintained and ordered?

**Development of policies, management protocols and standing orders for the Clinic?** What such policies and protocols will be needed to be developed?

**Information available to the Clinic staff for the travelers?** What resources and sources of information are available to clinic staff to keep ‘up-to-date’ with global traveler’s health information?

**Information available from the Clinic, for travelers?** What clinic resources are available for intending travelers? Are there any brochures or handouts?

**Services available to the traveler at the Clinic?** What services will the clinic perform and advertise?

**Processing of the traveler by staff within the Clinic?** How is the traveler to be processed through the clinic? Does the traveler attend the doctor OR the nurse OR both for different aspects of the intended travel such as information or vaccination.

**Merchandise available to the traveler at the Clinic?** Is there to be any travel health merchandise available for sale at the clinic? What appropriate merchandise will be sold?

**Referral agencies for the Clinic?** What agencies are available for clinics to refer travelers for ongoing medical care, either overseas during travel or at home following up on travel related medical conditions, viz: medical clinics, infectious disease clinics, altitudes and diving medicine sources, laboratories, radiology facilities and the like?

**The maintenance of standards of practice by staff within the clinic?** What ongoing professional training is the clinic staff undertaking? Has the clinical staff undertaken specialised training in the field? Do they attend post-graduate meetings and conferences in the speciality?

**What audit is available to assess, improve and maintain clinic standards?** What does the clinic plan as an audit process, viz: questionnaires, surveys, outside assessors?
2. GETTING DOWN TO THE BASICS

Lynne Bunnell, Manager for International Health, Citigroup Health Services, New York, USA

The fun and challenge of providing pre-travel care is in the details, and in the realization that your self-education can never cease. Each traveler provides a new collection of history and travel health needs. The fact that you are reading this monograph and aspiring to start a travel clinic means that those details appeal to you, a good prerequisite. If you pay attention to the important details when you set up and run your clinic, you will enhance your ability to provide the ISTM standard of excellent pre-travel care.

Regardless of the setting in which you practice – public health, university, occupational, for-profit, not-for-profit, etc. – the basics are still the same. You will need:

- Space adequate to care for your patient-traveler population.
- Basic office and medical supplies.
- Reliable refrigerator with thermometer, and freezer plus an excellent understanding of the importance of maintaining the cold chain in vaccine storage.
- Potential power back-up to be considered to ensure ongoing cool-storage of vaccines
- Supply of vaccines adequate to meet the clinic needs but not excessive enough to stress your cash flow situation.
- Up-to-date knowledge of the current vaccines and travel-related prescriptions used in your country.
- Resources including maps, country-specific travel health information plus printed and Internet supportive materials for daily and occasional use.
- Plans for taking phone calls and scheduling appointments.
- Policies and procedures to standardize the care you will give and ease the training of new staff. These would include job descriptions of all personnel.
- Organized medical record systems to document all patient encounters and allow for easy information retrieval, for example vaccine lot numbers in the event of a recall.
- Concise handouts for patients with a consistent, efficient method of recording what you gave and taught.
- Marketing plans for your services in order to develop a good reputation as a travel health care provider and to grow your business.

This monograph will provide you with much of the information you will need, and the resources to find the rest. One of your best resources is your ISTM community because we all strive to enlarge and perfect the practice of preparing travelers for the health challenges they will face on their journeys.
3. OPENING A TRAVEL CLINIC: CONSIDERATION OF THE PRACTICALITIES
Sarah Buckley Travel Clinic Director, Norwich, UK

When considering the sheer practicalities involved in setting up and opening a travel clinic, they can be usefully grouped as follows:
- The building itself
- The physical contents of the clinic
- Those items that may not physically obvious, but are essential

**The Building:** Whether one is buying or renting premises, they must be fit for purpose as a travel clinic, so as a minimum the requirements are for a reception and waiting area, a consulting room and a WC/bathroom. The premises should be accessible by those with physical disabilities, and legislation in some countries may require this, so it is worth finding this out before starting a search for the ideal location. Some clinicians may be happy to go to the disabled client rather than have them visit the clinic, giving more flexibility as far as premises are concerned.

Consent may be required from the local planning authority to set up a clinic in the premises (if, for example, they have been previously designated as office accommodation or retail premises). It is worth establishing this at an early stage as applications to planning authorities can take some weeks to be processed.

Thought should be given as to the interior decoration and design desired for the clinic, and paint and upholstery colours planned accordingly. Should the clinic look clinical and efficient, or relaxing and comfortable for instance? Rows of chairs for maximum seat space, or comfortable sofas? Health posters on the walls, or pictures of faraway places?

At this early stage it is worth looking at the electrical supply, and planning where to have additional sockets installed. The vaccine fridge should ideally go straight into a fused spur at the wall rather than be plugged in to a socket, where it may be accidentally turned off. It is likely you will underestimate the numbers of electrical sockets required, (the author needed twenty sockets in the reception area, and twelve in the consulting room).

Business premises that are open to the public may be obliged to provide emergency lighting in case of power cuts. The WC/bathroom should ideally have an emergency alarm for any client who becomes unwell whilst in there. Consideration should also be given as to whether the premises should have a security alarm, which will provide peace of mind, and should generally reduce the premium for business premises insurance.

**The Contents:** Once the interior has been decorated and the electrics completed, the desk and furniture can be brought in, and the clinician will finally have a place to work whilst planning the completion of the project.

The consulting room will require a patient-couch (just in case of vaso-vagal symptoms), a desk, a vaccine fridge, a worktop and cupboards above, a wash-basin and shelving for books and files. It is best not to physically position a client’s chair into a tight corner, as they may feel that pressure is being exerted on them to purchase. Some items such as the vaccine fridge, the medicines cabinet and the wash-basin, may be have to conform to specific legislation, which may vary from country to country. Inevitably this can mean higher purchase prices, but these items are often available second-hand via the internet. Thought should be given to the storage of data, hence paper records must be stored in a lockable cabinet, and this should be considered when purchasing office equipment for reception.
The waiting room should be welcoming and comfortable, with consideration given to the provision of cold water or coffee for the clients, and perhaps up to date magazines for the clients to look through if they have to wait. A current glossy travel magazine is a thoughtful touch.

Those clients who are bringing children will appreciate a box of toys in the waiting area, but not those which have small parts and are unsuitable for tiny children. Soft toys are not considered suitable by some authorities, due to their inability to be wiped clean.

**Unseen – but essential:** Not physically obvious (apart from the outside signage), but nevertheless essential items include:

- Stationery and website
- Fire safety
- Electrical safety
- Insurances
- Resuscitation items
- Telephones, computer systems and databases
- Other considerations

Stationery, website and signage should be designed as a package, with the business logo and fonts given plenty of thought. Consideration should be given to employing a ‘specialist designer’ to help in this regard, as these items all constitute a travel clinic ‘shopfront’ and public image. Money spent on a designer at this stage is a sound investment, helping to convey a professional image to back up the perception of the clinic as a centre of excellence.

Premises open to the public should be inspected annually. Similarly, a fire safety expert can visit the premises, advise on the correct number and type of extinguishers required, and any interior and exterior signs needed. They will also provide certification as required by the country legislation.

Insurances are needed for public liability, the premises, and for professional indemnity, but the precise requirements may vary from country to country.

Resuscitation equipment should be an absolute minimum of oxygen, adrenaline injections, and a telephone to summon ambulance or paramedic attendance. Small portable oxygen equipment and masks can normally be hired by the year, to include annual inspection and servicing. Some practitioners may be qualified or certificated to administer hydrocortisone and antihistamine injections in addition to adrenaline. These medications may usefully be kept altogether in a sealed box in an easily accessible place. In every clinic, the local resuscitation guidelines should be readily available where they can be seen.

It is cost-effective to research the varying tariffs for telephone and internet providers as there are some excellent deals available. The clinic may need to have more than one telephone line installed as there will be a requirement for a fax and an electronic payment terminal, or hub technology can be used on just one landline connection. Electronic payment terminals are now available in a completely portable form, using mobile telephone technology, although the monthly costs may be higher than a terminal that uses a landline connection.

Research will be needed into computer software that may best fit the clinic’s needs. Specialist programs are available for travel health clinics that include the risk assessment, prescription, invoicing and booking processes. Specialist travel health databases are available, varying by country, which can be accessed using an annual license fee. There may be other considerations to think about. For instance, legislation in some countries requires hazard identification for clients. This may include small notices to inform of hazards from hot water, heating appliances or loops on window blinds. A ‘hearing loop’ may be advantageous for deaf clients, and portable ones can be purchased from office suppliers.
records and accounts should be ‘backed up’ regularly. The most obvious way to do this is to download data onto CD-ROMs or memory sticks, but these must be stored safely as they may contain client data and hence be subject to individual country privacy issues. The most efficient way is to set up secure data storage with an IT company.

**Conclusion:** Taken altogether the practical points outlined above can seem to constitute an enormous task. Just take it one step at a time, make copious notes and lists, make a daily priority list, eat regularly and sensibly, and factor in some time off. Once all set up, friends and family will come into the clinic and say ‘How did you manage to do all this?’ The answer of course, is ‘one small step at a time’.
4. TRAVEL HEALTH CLINIC: START UP AND DEVELOPMENT

James Moore  Director, Travel Health Consultancy, United Kingdom

This section will look at some of the more universal aspects of service development which focus less on travel health per-say, and more on business development.

Practical suggestions

Don’t reinvent the wheel: It should be assumed that those setting up a travel health clinic are familiar not only with the subject, but also with the various national and international organisations, groups and services provided (and discussed elsewhere). Travel medicine courses, especially at a higher academic level, are often run by individuals who have previously set up clinics or who have appropriate contacts. If possible, arrange to see how these clinics are run in a scoping exercise, and if they are similar to your business model. Often people are more than willing to share successes and difficulties, provide hints and tips and offer general encouragement in this specialist area.

Think like a businessman or woman: Experience of working in both national and private healthcare systems has shown that being an excellent Doctor or Nurse does not immediately make you a good manager or businessman. Although managerial and business skills coexist in both areas, they are by no means innate. There will be times when the caring, sharing side fostered throughout our healthcare career has to be sidelined for a more hardnosed, business like approach. Areas requiring particular business skills include: Finance, Property management, Staff management and Advertising.

Remember, if you are successful, there are plenty of people who would like a slice of that success. People will be looking to get you to market their travel products – both good and bad, or people might offer competition. Competing pharmaceutical companies might appear to offer similar products or contracts, but check out the small print and carefully compare them all.

When setting up the clinic, look at products being offered and ask “do I need this item right now or can I work without it until the clinic is up and running?” For example, an expensive multi functioning IT reception/administration programme when an appointments diary might suffice until the exact IT requirements have been assessed.

If business acumen is not your forte, do not hesitate in obtaining sound business advice from the appropriate individuals, such as, accountants, business advice centres and even local government.

Take small steps when climbing the mountain: Although this speaks for itself, it is worth mentioning as in the enthusiasm to start one’s own business the smaller details can often be missed, with potentially time consuming and costly consequences.

On first look the mountain will always look daunting and insurmountable. However, having a structured approach, not being put off by the work involved and tackling obstacles one at a time is by far the best approach.

By laying out a scheme of all the details needing to be accomplished, it is possible to work through them in a methodical and structured way. At various stages one will undoubtedly come across uncontrollable constraints, hindering progress in a specific area. These are a natural part of development often cannot be influenced. It can literally be a case of ‘hurry up and wait’. In this instance, one has to accept the delay, revert to the plan and concentrate on another area of development.

Choose your daily jobs methodically: There are pro’s and con’s for how one approaches the work schedule. Some might advocate starting with the ‘quick wins’, setting the day off on a positive note.
Others might prefer to tackle a more complicated piece of work, thus overcoming the day’s biggest hurdle at the start, whilst fresh and awake.

If you have a plan at the start of the day, you have an option to change it should a hurdle present itself.

*Take some time off:* The motivation behind setting up a clinic, developing a service and perhaps even being one’s own boss can be a two edged sword. In the enthusiasm to progress one can lose track of the time and effort being expended. 12 hour days, evenings and weekends will all take their toll and it is vitally important to take regular, structured breaks, as well as remembering to eat properly.

**Service Consolidation and Development:** Once the travel health clinic is up and running, it is important to think about the following four areas.

**Consolidation:** There will undoubtedly ‘issues’ as all the systems and processes settle in. These are normal for any new business and should not be read as catastrophic failures, just an inevitable part of the business start-up process. Communication with established travel clinics contacted in the scoping phase should provide you with assistance and encouragement with these issues.

Do not be too swift to change aspects of the clinic in the opening phase, as process and practice will not have had time to settle in and work. There might be external influencing factors which are out of view and will naturally change, for example:

- Advertising at a local university will probably yield little in the way of increased appointments if done during exam time, when student’s minds might be elsewhere;
- Targeting an international business during an internal event affecting their staff travel itinerary.

Simplicity and routine are two techniques employed in industry which maximize safety and efficiency through the elimination of an inconsistent approach to processes. Although not directly comparable, there is a lot to be said for becoming adept at the common procedures which will be part of the everyday life in a travel clinic, and these have been discussed elsewhere in this monograph.

Entering events, ideas and issues into a log book is a very useful and practical method of keeping track of the whole process. It is also useful for future reference, should you offer assistance to other fledgling clinics.

**Service Development and Keeping up to date.** A good ethos to have when running a dedicated travel health services is that they should be ‘centres of excellence’. Maintaining this position does not come from repeating the same tasks or jobs, but through self examination and service development.

Ask the following questions

- Is this process the most up-to-date?
- Is the process grounded in sufficient research and/or experience?

Keeping up-to-date, fundamental to personal development, can be achieved in a number of ways such as: Setting apart regular, non-clinical time is an excellent way in which to facilitate the reading of articles and if the clinic employees more than one member of staff, education or teaching opportunities as well.

Attending conferences are an important way of keeping up to date, networking, sharing ideas and revitalizing oneself. Review conference programs though as you might find them covering previously attended topics.

**Introspective Evaluation:** Further to this, one might use a Strength-Weakness-Opportunities-Threats analysis.
This review process will highlight many issues which contribute to the successes and failures within a business. However, self evaluation provides a subjective opinion. There are two other options which will balance the business analysis, peer review and client opinion.

The first, allowing a peer to assess one's clinic, might seem somewhat daunting, as nobody enjoys their work and business strategy being open to scrutiny. However, if done in a constructive and open manner, peer to peer review can be extremely useful.

The second process involves the service user. Part of the pre-clinic planning process should have involved the capacity for listening to clients and their views/ideas on how the service should develop. This often provides an insight unperceivable to clinic staff.

Not only does this process enable client focused development, but when people observe their views being listened to/acted upon they are more likely to re-use the service.

**Networking:** The final part of service development to be mentioned is networking. Although networking has some negative connotations, if done with honesty, openness and integrity it can be a valuable way of obtaining contacts. Contacts will often lead to potential areas of business which would previously have been kept behind closed doors.

There are various networking agencies and organisations available with accompanying variations in price and administration fees, so do your research carefully. In the UK, as elsewhere, these might include: Specialist networking organisations, Women’s networking organisations, Local business groups, Chamber of Commerce Groups, Rotary Organizations and the like.

**Reviewing:** Finally, it is necessary to review progress on a regular basis. This might take the form of a bi-monthly review examining any small problems, actions and developments, with a yearly review observing the bigger picture. At this point one can examine areas such as accounts, successes and failures and service provision, whilst looking forward to future development strategies.

Part of the yearly review should include a comparison of one’s initial business plan and financial forecast, with the first year’s actual financial figures. This will provide interesting information, such as the accuracy in your initial forecast, assisting you with any future financial predictions.

After the initial launch, relaxing into a familiar pattern of work is important as it enables time for consolidation, evaluation, and an element of relaxation. However, if your clinic wishes to remain a ‘centre of excellence’ and at the forefront of travel healthcare delivery, resting on one’s laurels should be resisted. The enthusiasm and energy for creating a travel health business needs to be transformed into an enthusiasm and energy for its clientele.
5. EXPECTATIONS OF A TRAVEL HEALTH PROFESSIONAL

Marc Shaw, Associate Professor and Medical Director, WORLDWISE Travellers Health Centres, New Zealand

The International Society of Travel Medicine (ISTM) website states “the specialty of travel medicine encompasses many disciplines including epidemiology, infectious disease, public health, tropical medicine, and occupational health. As a unique and growing specialty, it has become necessary to establish standards of practice in the field itself. These standards have been established to recognize the scope of competencies expected of travel medicine practitioners (both medical and nursing), guide their professional training and development, and ensure an acceptable level of patient care”. The ISTM lists this body of knowledge at www.istm.org.

The acquisition of appropriate sources of travel health information are, therefore, all important. Whilst there are some references (such as the World Health Organisation in Geneva, and the Centers for Disease Control in Atlanta) it usually doesn’t matter which other sources are consulted, provided that they are authoritative, informative, up-to-date, and comprehensive. Oh, and don’t forget an atlas – surely THE most important reference of all!

As knowledge is gradually building, it is useful to develop a ‘Should Know’ and a ‘Could Know’ list of topics to initially gain knowledge in. Information is changing so quickly, and often so dramatically, that anyone providing travel health information needs to be aware of the requirements of international travelers.

‘SHOULD KNOWS’

A traveler going abroad should have advice based on the appropriate risk assessment on travel to that region and needs to be based on a broader view than just administering drugs and vaccines. This advice should reflect the health risk and not just the interventions available. An emphasis on immunisations for low risk travel may give a false sense of security and encourage unsafe practices such as eating and drinking, and so any emphasis on vaccinating travelers (rather than advising them) is a widely held misconception and needs to be corrected.

Prevention of ill-health in the primary care situation requires effective advice and good communication between intending travelers and their health advisers. Health promotion and health education need to be the focus of pre-travel consultations, and a patient going to a developing country SHOULD be able to expect, at the very least, travel advice and information from a Travel Health Professional on the following subjects:

- Pre-travel issues such as malarial prevention, appropriate immunisations and when they need to be given
- Advice on the prevention of alcohol-related, drug-related, or sexually-related diseases, in those whom they are accessed as being appropriate
- Air travel (e.g. fitness to fly, prevention of deep vein thromboses and jetlag)
- Advice on travelling: e.g. jetlag, deep vein thromboses, the safety of land travel in developing countries
- Health advice on protection against insects and mosquitoes, animal bites
- Eating ‘safe’ food and drinking ‘safe’ water. Advice on diarrhoeal prevention and management
- The prevention of injuries whilst travelling, and to whom to seek advice from if injury or illness occurs
- Advice on safety and security issues whilst travelling
- The essentials of a basic medical kit for the traveler, information on the kit and how to use its component medicines and dressings
- What conditions to self treat, guidance on what the appropriate treatment for these should be, and which to seek medical attention for; whilst abroad
- Which vaccinations are considered the most appropriate for the anticipated travel arrangements

Consultation with a patient who is intending to travel can be time consuming. As a guide, a consultation for a first time traveler can take anything from 30-60 minutes; with vaccinations extra. For the traveler
who has been for previous consultation, of just needs an update, then a consultation time could be a minimum of around 20 minutes as current updated knowledge is imparted.

‘COULD KNOWS’

In addition to the essential information listed above, there are those conditions and issues that the Travel Health Professional could know at the next stage of their learning. These relate to the specifics of a travel health situation, for example:

- Tropical diseases in the intended regions of travel
- Pregnancy and travel
- Children and travel
- Specialist issues for those that travel (e.g. the AIDS traveler, the traveler to the Haj, sport-groups, school travelers), and also to disadvantaged (e.g. elderly, cardio-compromised etc) or disabled travelers
- Remote and extreme travel: e.g. expedition and adventure travel, sea-faring
- Psychological aspects of travelling. This is especially important for those who are going on long term missions or on re-pat locations. Many missionaries and especially children going on overseas scholarships need to be given clear guidelines on such aspects as the prevention of loneliness, what to do in an emergency, and how to get out of the country urgently.
- Altitude sickness. Travel Health Professional need to be knowledgeable about altitude sickness, or acute mountain sickness, in its early and recognisable stages. Prevention of the more serious forms of the syndrome needs specialist preventative management, and patients may need to be referred accordingly.

There are many infectious diseases that can trouble the traveler, nevertheless, such diseases actually account for only around 5-8% of the mortality and morbidity of travelers. Most problems that are likely to occur to travelers are safety and security, cardiac or accident related, and therefore pre-travel prevention assessment and counselling needs to be appropriately stressed to those at risk of general disease as well and the specific diseases that relate to the traveler.

Finally, as the international community accepts travel as an essential part of daily life and business, those in public health, infectious diseases and general practice are being asked about such diseases as: Schistosomiasis, rabies, cholera, Japanese encephalitis, yellow fever, dengue fever and the variant forms of haemorrhagic disease. In time the busy Travel Health Professional can also gain knowledge and experience in managing these diseases.

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6. TRAVEL CLINIC STYLES

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There are many types of ‘travel medicine practice’, and these may be in clinics, in offices or in the surgery. The clinic type and style may be varied depending on the country in which the clinic is situated and the respective health care system. Nevertheless, the types of clinics can include:

‘For profit’ clinics - this type of practice seeks to make profitable earnings. There is a tax-liability with making a profit, but the money earned belongs to the practice owner. This type of practice tends to be assertive in advertising and has a higher patient turn-over in order to maximize the financial rewards. Included in this type of practice are physicians who have a business background, wish to work full-time in commercial travel medicine, practice medicine part-time or who have a nurse that runs the travel medicine section. Also included are pharmacists who provide immunizations and varying degrees of counseling at a retail pharmacy.

Nonprofit clinics - private non-profit clinics can make money, but they are required to place profits back into the business and not be used privately. There is a certain legal status as a non-profit clinic and the documentation has to be very fastidious in order to keep taxation and legal authorities happy. University travel clinics fall under this category, particularly if the institution is governmentally-funded or operated. Such academic centers may also have an investment in research at the travel clinic level which greatly benefits all travel medicine practices. Academic clinics in the US are often tied to insurance agreements contracted by a teaching center and thus vaccine and office reimbursement may be less than the full amount billed.

Public health departments - these types of travel clinics are run by governmental bodies whether at a county, regional or national level. Such a clinic may provide only vaccinations and not counsel, or they may be comprehensive care. Funding for such clinics can vary greatly and may be cut when governments feel the need to tighten purse-strings. The fees at public health department travel clinics can be substantially lower than either ‘for-profit’ or private nonprofit clinics.

International clinics - this type of clinic may be part of a chain of travel clinics, which may be found in multiple countries. These practices have the same basic issues as all others, but are complicated by needing to follow the medical and legal requirements of the host nation, which may vary quite greatly from the clinic’s country of origin or primary service practice of patients. Such clinics are not generally primarily targeted to travel medicine, but have a ‘generalist brief’.

Corporate practices - corporations can have quite different needs to those of private citizens and their travel clinics reflect this. In corporate practice, it is preferable to have staff prepared well in advance of journey in case of last-minute business trips which would leave little time for adequate immunization or education. In addition, businesses may have employees working abroad for extended periods and thus have additional needs, including the need for long-term, regular care and ready access to support from the home nation.

Each type has a unique flavor and style of operation, with different needs and different orientation towards the practice of travel medicine.
The travel medicine clinic that is the subject of this article is owned and managed by the author, a registered nurse. The clinic is a preventative travel health facility that does not diagnose or treat any travel or non-travel medical conditions. Thus, legally, there is no physician on the premises. In addition, this clinic is located in the State of California and all 50 of the United States have different laws regarding how registered nurses may practice in various clinical scenarios. However, to assure safety of all patients in a preventative nurse managed clinic, a medical doctor is required to be available, at all times, for consultation, random chart review and collaboration with clinical protocols and standardized procedures.

The described travel health clinic provides vaccines, standardized limited travel medications and official health and safety advisories. Nevertheless, regardless of professional status, all travel medicine practitioners should find much of this information applicable to their own daily travel health practice.

As a travel medicine clinic with a complete stock of vaccines, this 19 year old clinic has developed a reputation in the community as a source for physicians to refer their patients for routine immunizations and of course, providing their patients with travel health needs. We have become a major referral source for immunizing non-travelers, such as employees, government workers, school children and college students, along with tuberculosis, and antibody testing. With this in mind, the travel clinic must take into account the complexity and time required for each appointment made without any “in and out quickly” attitude. All patients, whether or not they are traveling, become our clinic’s responsibility. We need to ensure that all travelers and non-traveling patients have enough time with the practitioner for proper health evaluation, advice, administration of appropriate vaccines and possible follow-ups. In addition, we remain mindful that we specialize in travel health. The clinic staff considers this clinic to be a private public health facility with the emphasis on international public health as its priority. Most non-travelers to our clinic have come to respect our mission, understanding that appointments are made around our international travelers.

Our travel clinic attempts to have a non-clinical appearance, with international furniture and collection of many worldwide articles on the shelves, walls, etc. These anticipating travelers, therefore, know that they have definitely come to the right place.

Scheduling is prepared in partnership with the receptionist and the office manager. If the employee is new, the nurse must take time out to hold educational meetings with this new member in order that he/she clearly understands the importance of maintaining a timely and flexible schedule. Our term for a “flexible” schedule includes many factors. Below are a few of the factors the staff considers when scheduling appointments:

It is important to obtain information with regard to the patient’s age, allergies, health problems and itinerary. The scheduling information should also note if they are previous travelers, new travelers, employees, government workers as well as school children and college students.

It is rare for us to accommodate travelers and patients who arrive without an appointment. Therefore, it is important that they feel welcomed and encouraged to make an appropriate appointment. If this cannot be arranged at a mutually agreeable time, then every effort is made to refer them to other qualified travel health providers or public health facilities that offer quality care.

The Daily Routine
Having a general idea on how this travel medicine clinic operates, let us proceed to a typical day at this facility, a clinic that has daily hours from 10:00 to 18:00.

At 0930, the nurse and staff prepare for travelers and patients for the day. First, the nurse and office manager check and log the vaccine temperatures, in both the dedicated vaccine refrigerator (35° to 46° F or 2° to 8°C) and dedicated vaccine freezer (5°F or -15°C). If there are discrepancies in temperature with one the internal thermometers, it is reported to the specific vaccine companies for recommendations for possible returns, discard or, the best circumstances would be to save and use.

While the receptionist is answering the phone, returning calls and making future appointments, this practitioner and office manager review the patients’ schedule, printed the evening before, by the receptionist. A computer-revised schedule will often be handed to the Travel Health Practitioner (THP) throughout the day due to cancellations, rescheduling and additions.

Although this clinic employs a cleaning service, specializing in medical service facilities, it is still prudent for the next task to inspect the clinic for neatness and cleanliness.

The medical consultant (MD) is then notified that the clinic is prepared to see patients and that the physician’s cellular phone and back-up numbers are available if consultation is needed.

At 10:00, both the receptionist and office manager welcome the first scheduled traveler(s). If the traveler is more than 15 minutes late, rescheduling may be necessary to avoid other patients from having to wait. Although this policy may seem a bit strict, other travelers or patients who are on time must be seen at their appointed time, to prevent delay in other scheduled following appointments. Adherence to this scheduling policy is rigorously enforced. Adequate time must be well thought-out to avoid any stress to all involved. This gives the nurse and patient adequate time together.

If the traveler or patient is a “no-show” but wants to reschedule, our new policy is to obtain his/her credit card information to secure their next appointment. In the past, we have given emergency bereavement travelers and “missionaries” deep discounts. Many of these individuals have taken advantage of this opportunity where we end up with bounced (no money in the bank) checks with no recourse. Sadly, the well intentioned must now pay for their office charge as well as full price for invested vaccines with cash or credit card.

The traveler is provided a consent form along with a traveler’s medical history form. Travelers are expected to bring in their list of all prescribed, over-the-counter medications, vitamins and herbs to be reviewed by the travel health nurse. Additionally, travelers are also expected to provide us with a specific printed itinerary.

It is imperative to determine the exact travel itinerary on the phone. The receptionist may hear “we are only going to South Africa for 3 weeks”. One could assume this could mean only ‘party time’ in Cape Town. However, when the actual itinerary is finally reviewed, we frequently find that South Africa is only a part of the trip. The accurate itinerary could include Botswana, Namibia and Victoria Falls (Zambia and/or Zimbabwe). It is an absolute necessity that we collect all information given to the receptionist, as well as the printed itinerary along with the patient’s travel information form.

The THP is responsible for administering the appropriate immunizations, the handling of pre-authorized prescriptions and especially assuring that the traveler understands the specific advice necessary for a safe and healthy travel destination.

The Consultative Process
After the traveler completes the legal and medical information forms, the THP greets the traveler to begin the following:
Consultation

‘Do you have the time (at least one hour), to provide up-to-date travel informational tools, the compassion and travel counseling skills to prepare travelers who want to explore unknown territories? If the answer is yes, then go for it! If the answer is “no” or?, then you may want to consider your priorities by taking a medical management course and, unquestionably, by taking current travel health courses’. It is best to take at least one course that would prepare you to sit for the exam for the International Society of Travel Medicine’s Certificate of Knowledge in Travel Medicine™. In our clinic, we have found that taking continuation courses as well as credentialed courses in travel health, on an ongoing basis, gives us confidence that we are providing “state-of-the-art” services to our travelers.

A counseling format is only a guideline, because we recognize that each patient has his or her own personal needs. Those needs must be considered. Consultation does not end with this previous short explanation. It continues throughout our contact with the patients during their scheduled appointment(s). Additionally, regardless of our well thought out efforts, we can expect telephone calls with questions regarding some of the verbal and written information that they have already received. Although these inquiries may seem rather redundant, in spite of our previous and thorough consultation, we do welcome these calls. It could likely be that some of these travelers need further clarification as a result from sources outside, giving advice or comments from friends or other well meaning health professionals who are not trained in the field of travel medicine and who pass on incorrect information. For an example, “my doctor told me that he has taken a trip to India and only needed a tetanus shot”. Another example, “my friend just got back from Thailand. He had no immunizations or medications and had no problems, so why do I need anything”? These inquiry calls can be rather challenging, to say the least. However, we do encourage a safe and healthy journey with the appropriate advice, which then gives the patient a share of their own health responsibility. Here is one example that the receptionist uses to encourage a safe and healthy travel: “Okay, so you have driven from Palm Springs to Los Angeles and back (total 180 miles) without using your seat belt and did not encounter an accident. What are you telling me?” That really should the extent of the telephone conversation, unless the reluctant caller wishes to make an appointment and proceed with the necessary preventive measures and precautionary advice. We are not travel vaccine or medication vendors. With patience and understanding, our professional knowledge in travel health counseling will give the traveler valuable information and realize the importance of the official vaccine recommendations¹ and potential risks that could be avoided.

Assessment

The travel health assessment includes basic vital signs. For the most part, the medical history and vital signs along with observing the traveler’s physical and mental ability to travel is all that is necessary, reminding us that we are not their primary health care provider. However, just this simple exam may send up a red flag to evaluate the traveler’s fitness to travel or even evidence of a possible life threatening condition that must be addressed prior to travel. If this is the case, the evaluation continues with a more thorough assessment, documented and reported to the medical consultant and, of course, the traveler’s family physician for further follow-up and/or possible treatment. If this situation occurs and the treating physician gives his/her consent for the patient to travel, the traveler is given another appointment after both the travel medical consultant and the travelers’ primary physician provides this clinic with the necessary information to precede with our travel health procedures. At the risk of being over-dramatic, just by conducting a simple physical assessment, this clinic has found multiple previously unnoticed health or even life threatening medical problems.

Immunizations and medications

¹ Our official recommendations are derived for the Centers for Disease Control, Canada Health, ProMed™ and daily foreign press releases.
When travelers visit a travel health clinic, they rightfully assume that they will be given immunizations and medications for their trip. This clinic is setup to provide that service with the use of standardized procedures and algorithms. When using algorithms, for both legal and professional reasons, we utilize a program that has a reliable reputation and is commonly used by fellow travel health providers, government officials and the like.

Prior to any vaccines given, patients are required to read vaccine information statements regarding the vaccines they are about to receive. They are given adequate time to ask questions about the required or recommended vaccines, prescribed and over-the-counter medications. The patients give their informed signed consent each vaccine.

Oh no, a vaccine reaction! This dilemma can come up on an occasion. This is why it is imperative that the vaccine administrator knows exactly how to respond in such an unpleasant event. Additionally, the non-medical/nursing staff must be prepared to follow the vaccine administrator’s emergency orders.

Often, a vaccine reaction can be safely taken care of without much disruption. However, should a life-threatening reaction occur, such as anaphylaxis, a specific protocol is in place and additional emergency medications and equipment are immediately available. One important aspect of this protocol is to have a staff member call (911) immediately. This is our emergency response system in the United States, which calls well-trained emergency paramedics to the scene. These lifesavers literally take-over. Once the patient is stabilized, he/she is transported, by ambulance, to a local hospital emergency department for further observation and/or treatment. The paramedics are usually at the scene within a few minutes, unless the clinic tends to be located in an underserved location.

Travel health and safety advice
Are we overwhelming travelers with too much international health and safety advice? This question surfaces at nearly every professional travel health meeting. Our answer from this clinic is an unambiguous no! Obviously, even the well-seasoned traveler learns new health preventive advisories from the THP. However, verbal advice can be quickly forgotten, especially if the advice does not coincide with the same informational handout form that was provided to them. We have also found that it is best to give plenty of space for the THP to hand-write specific and individual-targeted directions. This provides important personalized advice to the individual traveler. By this method, we have found that travelers will pay special attention to this hand written advice included that on our standard “Know Before You Go” form.

Conclusion
Regardless of professional status, the day-to-day operation of a travel clinic with its preventative health objectives should be quite similar to all THPs. Nevertheless, variations can be expected by the size of a clinic, whether it is physician or nurse managed, and location of the travel health facility. In addition, clinics further vary in the type of traveler that they service, and within legal guidelines for practice that differ for various States or countries of practice.
THE ABCs

C. Setting Up The Clinic
1. ROLE OF THE CLINIC

Marc Shaw, Associate Professor and Medical Director, WORLDWISE Travelers Health Centres, NZ

A ‘one-stop shop’ for travel health remains the most efficient way of dispensing travelers’ health advice. A clinical consultation is often a good precursor to understanding the use, and subsequent sale, of appropriate product that could be of value on an intending trip. The role of the clinic then needs to be different to that of a standard family practice. In the latter there is a set clientele, whereas a travel health practice has a transient population and so its survival is based upon different criteria to those of the family practice. This is something that may be hard for a health practitioner to understand or accept, as they are not usually trained in business acumen, and so a non-clinical manager for the clinic becomes a necessity. The amalgamation of the clinical and applied related services is reflected in the number of people that use the clinic, so ongoing self-audit becomes essential in providing traveler’s health care.

Starting a Clinic ‘de novo’ is hard and requires an understanding of the market that it will service, and the traveler base that will use it. Here, then, is the first exercise in determining any local need for a travel health clinic, viz:

- check the available resources in the region within which the clinic is to be managed
- understand the needs of the local travelers
- form alliances with strategic partners appropriate to the clinic’s intending needs.

Travel agents often do not specifically refer to travel health clinics, and this has long been a source of bewilderment to health professionals. Why would one not want to refer travelers for good health advice? Well, the answer is fourfold: there is a constant turnover of personnel in the field, they are trying to survive in an increasingly competitive market and often forget to refer, they are fearful that disease in an intended region of travel may put their clients off going there, and they lack appropriate information and education.

In establishing a travel health service that is to be professionally recognised, the aim of the provider clinic must be to provide a service of excellence for travelers with general and specific health needs whilst itinerant abroad, either from or to a host nation. Simply defined: "The quick and efficient provision of specialist travel health information as would relate to health advice on any aspect of pre-, intra-, or post-travel. Such information requires continued appraisal of global information sources on individual country requirements and recommendation, the available health merchandise for the traveler, clinical and diagnostic abilities in pre and post-travel assessments, and knowledge of and service provider abilities in intended countries of travel".
2. ROLES WITHIN THE CLINIC

Marc Shaw, Associate Professor and Medical Director, WORLDWISE Travelers Health Centres, NZ

Starting a Clinic ‘fresh’ is hard and requires an understanding of the market that it will service, and the traveler base that will use it. Another clinic choice could well be to seek out an association or franchise with a major player in the specialty field. The first exercise in helping with a decision on ‘which way to go’ is to do a ‘needs-assessment’ of offered services in the region where the clinic is anticipated. Questions that will need to be answered are:

- ‘Is there a need for a clinic in the projected region of practice?’
- ‘Have you checked the available resources in the region where the clinic is to be maintained?’
- ‘Have you understood the needs of the local travelers from the region?’
- ‘Can you form alliances with strategic partners appropriate to the clinic’s intending needs?’

The Doctor’s Job Description. In each of the KEY TASK sections, the doctor needs to:

Consultation
- Assess intending travelers by consultation to determine the need for appropriate health advice and care. The emphasis of the consultation would be on the preventative of illness, and what to do should illness occur
- Prepare and conduct travelers in any appropriate pre-travel assessments, examinations, and vaccinations

Medical Responsibilities
- Conduct pre- and post- travel health consultations, assessments and examinations
- Plan and initiate management protocols for travelers with common health issues, i.e. ‘the prevention of malaria’, ‘vaccine recommendations’, ‘good food and water safety advice’
- Counsel and educate travelers on maintaining health, and preventing accidents and illness whilst abroad
- Preparing medical referrals, certificates and medical prescriptions whenever appropriate.
- Lecture and present discussions to interested groups on health-care whilst travelling
- Promote the clinic’s service to primary referral agencies, such as: medical practices, practice nurses, and travel consultants

Health Maintenance and Promotion (in association with the practice nurse)
- Maintain traveler records and appropriate clinical data
- Follow up specific travelers requiring support, education and ongoing pre- and post-travel management and treatment
- Maintain personal standards in travel health education, centered on the promotion of self-care whilst travelling. This process will require constant upskilling in infectious diseases, travel health issues, geographical medicine (pertaining to specific global regions as well as that relating to environmental conditions, such as altitude and seaworthiness) and practical health survival measures. Such maintenance would require an ongoing responsibility for continued education in travel medicine by attending seminars and conferences in the specialty
- Take part in ongoing professional and clinic surveys as required
- Promote the clinic’s philosophy of helping travelers being ‘informed and prepared to care for themselves whilst travelling’
- Be available to visit family practitioners, travel agents, sports and education groups, and other travel-focused agencies, to promote information and advice

Delegated Medical Care
- Advise clinic staff on the management of users of the clinic, viz: management of telephone calls, what advice can be given by clinical and non-clinical staff, how best it can be given, and how such advice can be turned into clinic attendance
- Recommend and administer, or delegate administration of, appropriate immunizations.
- Prepare travel medical kit information and equipment
Advise on specialised treatments, assessments of health care and administration of medications within the clinic, e.g. making sure advice on insect repellents is consistent and up-to-date

Advise on specialised treatments, assessments of health care and administration of medications that may be required by the travelers whilst abroad, e.g. advising an appropriate altitude sickness regime

Develop emergency health protocols for use in a traveler’s health and vaccination clinic, e.g. ‘how to manage an anaphylactic reaction’

Equipment and Supplies:
- Overview and maintain clinic equipment, in association with nursing staff
- Overview the clinic’s appropriate medicines, vaccines and medical supplies; as well as determine the availability of travel health product at the clinic
- Overview a safe clinic environment for all staff

Professional Requirements
To conduct the requirements or license of the clinic the doctor is required to have:
- A current Medical Council registration to practice
- Medical protection insurance indemnity
- Post-graduate training and experience in current travel medicine clinical practice
- Knowledge and current skills in first aid and resuscitation

This breakdown of the doctor’s role gives a good guide as to an accurate template of what the tasks of the doctor are in a travelers’ health centre. It is not an exclusive job description and other requirements may be included specific to the needs of an individual clinic, as and when considered appropriate and according to an individual clinic’s standards of practice.

The Nurse’s Job Description
Many clinics are nurse-operated and nurse-maintained, but there will be many where the nurse has a primary responsibility to the medical director or practice manager. In each of the following KEY TASK sections, the role of the nurse needs to:

Consultation
- Assess intending travelers and by consultation to determine the need for appropriate health advice and care.
  The emphasis of the consultation would be on the preventative of illness, and what to do should illness occur
- Prepare and conduct travelers in any appropriate pre-travel assessments, examinations, and vaccinations

Nursing Responsibilities
- Conduct pre- and post- travel health nursing consultations, assessments and examinations
- Plan and initiate management protocols for travelers with common health issues, i.e. ‘the prevention of insect bites’, ‘vaccine recommendations and administrations’, ‘good food and water safety advice’
- Counsel and educate travelers on maintaining health, and preventing accidents and illness whilst abroad
- Preparing health advice for the individual traveler where appropriate
- Implement and maintain a recall system for immunizations and future health care needs.
- Talk with interested groups about health-care whilst travelling
- Promote the clinic’s service to primary referral agencies, such as: primary health care nurses, and those working in the travel industry

Health Maintenance and Promotion (in association with the doctor)
- Maintain traveler records and appropriate clinical data
- Follow up specific travelers requiring support, education and ongoing pre- and post-travel management and treatment
- Maintain personal standards in travel health education, centered on the promotion of self-care whilst travelling. This process will require constant upskilling in infectious diseases, travel health issues, geographical medicine (that pertaining to specific global regions as well as that relating to environmental conditions, such as altitude and seaworthiness) and practical health survival measures. Such maintenance
would require an ongoing responsibility for continued education in travel medicine by attending seminars and conferences in the specialty

- Take part in ongoing professional and clinic surveys as required
- Promote the clinic’s philosophy of helping travelers being ‘informed and prepared to care for themselves whilst travelling’
- Be available to visit family practitioners, travel agents, sports and education groups, and other travel-focused agencies, to promote information and advice

**Specific Nursing Care**
- Recommend and administer, or delegate administration of, appropriate immunizations.
- Prepare travel medical kit information and equipment
- Advise clinic staff on the management of users of the clinic, viz: management of telephone calls, what advice can be given by clinical and non-clinical staff, how best it can be given, and how such advice can be turned into clinic attendance
- Advise on specialised treatments, assessments of health care and administration of medications within the clinic, e.g. making sure advice on insect repellents is consistent and up-to-date
- Advise on specialised treatments, assessments of health care and administration of medications that may be required by the travelers whilst abroad, e.g. advising an appropriate altitude sickness regime
- Develop emergency health protocols for use in a traveler’s health and vaccination clinic, e.g. ‘how to manage an anaphylactic reaction’

**Reception:**
- Assess urgency of telephone calls of a clinical nature, to the clinic
- Develop a policy, together with the doctor and receptionist, on giving telephone advice and information. Guidelines for each clinic would need to be developed for this
- Accurately relaying and recording traveler clinical information to the doctor
- Attending to general receptionist tasks when occasionally needed

**Equipment and Supplies:**
- Overview and maintain clinic consultation rooms and equipment
- Maintain, order and re-order all clinic equipment
- Order all vaccine supplies and maintain the cold-chain form vaccine preservation
- Overview the clinic’s appropriate medicines, vaccines and medical supplies; as well as determine the availability of travel health product at the clinic
- Overview a safe clinic environment for all staff; particularly with respect to disposal of ‘sharps and needles’

**Professional Requirements**
To conduct the professional requirements of the clinic, the nurse needs to have:
- A current Nursing Council registration or license to practice
- Training in all aspects of immunization, viz: immunization schedules, immunization procedures, reactions and contra-indications to vaccination, dealing with emergencies, and understanding vaccine storage
- Professional protection insurance indemnity
- Post-graduate training and experience in current travel medicine clinical practice
- Experience with current nursing techniques and skills, including counseling, venesection, blood pressure monitoring, clinic emergency and first-aid management
- Knowledge and current skills in first aid and resuscitation

This breakdown of the nurse’s role into KEY TASK areas gives a reasonably complete template of what is expected of a travel health nurse. Whilst not exhaustive it serves as a good guide for the enthusiastic beginner. Other requirements may be included specific to the needs of an individual clinic, as and when considered appropriate and according to an individual clinic’s standards of practice.

The Role of Practice Administration Staff
Many travelers’ health clinics are run in association with a family medical practice, and as such the organization of the clinic will often be through that practice. Specialist travel health clinics however, will need to focus their administration on the services that they provide, and in so doing will need the guiding assistance of administration staff, namely: a practice manager and/or receptionist. The roles of such people in the clinic tend to overlap somewhat as a non-clinical resource. With each KEY TASK In each of the following sections, the practice administrator needs to:

**Assessment and Reception**
- Plan management protocols for travelers wishing to attend the clinic
- Counsel, in association with the clinical staff, by telephone or interview to assist in knowledge dissemination for interested and intended travelers
- Develop a strategy for such assessment that is courteous, appropriate to the travelers’ initial reason for calling, and minimizes time taken
- Schedule travelers’ appointments with the doctor or nurse, allowing adequate time for consultation and appropriate vaccinations or procedures
- Welcome intending travelers into the clinic, issuing them with information on the services and a pre-consultation information form to complete

**Practice Management**
The practice management component of the practice manager / receptionist role will have primary responsibility for developing the following areas:
- Understanding local policy on administration of appropriate claim forms either for, or on behalf of, the intending traveler
- Arranging of health funding claims payments
- Developing and implementing policy on clinic human resources, such as: staff relations and co-ordination, hiring and firing of staff, writing/updating job descriptions/ contracts, ensuring adequate staffing levels, dispute management, and organize clinic staff routines
- Providing mediation for travelers and clinic staff, where appropriate
- Organizing and developing the clinic clerical system, with regard to: communication with health organizations, stock and product management, filing and clinic communications, maintenance of clinic rooms, clinic financing and staff wages
- Organizing and maintaining clinic information for travelers
- Maintaining clinic reception and management facilities
- Organizing clinic cleanliness

**Health Maintenance and Promotion (in association with the clinical staff)**
- Maintaining traveler charts, appropriate non-confidential clinical data and ensure clinic database is maintained and up to date
- Setting up, maintaining and implementing a traveler recall system for immunizations and health care needs
- Setting-up, establishing a database of doctors, medical practices, and others that refer to the clinic’s services. Such a database will need ongoing maintenance and be up to date
- Promoting the clinic to all interested and appropriate organizations with an interest in assisting health for travelers – e.g. pharmaceutical companies, insurance companies
- Guiding clinic staff in the development of clinic policies for all areas of clinic practice, viz: infection control, needle-stick injuries, health and safety act etc
- Developing and implementing non-clinical clinic audits, in association with the clinic staff
- Negotiating with appropriate organizations for ongoing clinic medical supplies

**To conduct the requirements of the clinic, administration staff would be required to have:**
- Experience in management skills and practice management
- Experience in communication and telephone skills
- Fluency with computers and in appropriate computer programs
- Knowledge and skills in practical first aid and resuscitation
This assessment of the practice management role into KEY TASK areas gives a good guide of how to organize and manage a travel health nurse. It is not complete but remains a basic template onto which an individual clinic may put its own caveats.

The Role of Other/Ancillary Practice Staff
With a need to consider various specialized medications in a travel health consultation, some practices develop a close relationship with a pharmacist. Indeed some pharmacists practicing in their own rights have developed an interest in travel health issues, and subsequently have developed consultation skills in the specialty. This is not the ‘norm’ however, and most pharmacists would chose to work with dedicated travel health professionals for an enveloping betterment of an intending travelers’ knowledge.

If a pharmacist is to be brought into the clinical team in a travel health practice, the role of such a person will need definition. It may be decided that a clinical consultation role is that required, or it may be that the pharmacist is involved in supplying the clinic with medicines and products appropriate to travel.

Some bigger clinics have laboratory staff involved in the clinical consultative process as well. In having such staff involved in a clinic, it is essential that the professional relationship of all other ancillary medical providers be established at the creation of the clinic.

References:
Spira AM. Preparing the traveler. Lancet 2003; 361: 1368-81
3. INFORMATION SOURCES

Vanessa Field, Associate Specialist in Travel Medicine, National Travel Health Network and Centre, London
[with additional sources from Anne M. Anglim (USA), Albie de Frey (South Africa), Peter Leggat (Australia), Philippe Gautret (France), Steve Toovey (Switzerland), Marc Shaw (New Zealand)]

A travel health advisor should be able to make an accurate pre-travel risk assessment of each individual traveler and their itinerary, and give appropriate risk management advice. In order to do this, a travel health advisor must use current, authoritative, evidence-based sources of travel health information and remain up-to-date with destination-specific health risks including outbreaks of disease.

Printed sources allow comprehensive reading on travel medicine subjects (and its component disciplines), whilst electronic media allow access to dynamic disease surveillance reports and current destination-specific national and international travel health recommendations. These sources should be available for use during a travel health consultation.

This chapter provides information on key travel medicine resources. The electronic resources were current at the time of writing.

International, Regional and National Travel Medicine Societies, Competencies, Courses and Conferences

International Society of Travel Medicine (www.istm.org)
- Conference of the International Society of Travel Medicine
- Body of Knowledge for the Practice of Travel Medicine
- Certificate of Knowledge Exam
- Expert Opinions in Travel Medicine
- Introduction to Travel Medicine Slide Set
- Travel Medicine Review and Update Course

Previous and Ongoing Regional Travel Health Conferences
- Northern European conference in Travel Medicine (www.nectm.com)
- European conference in Travel Medicine (www.ectm6.com)
- South African Society of Travel Medicine (www.sastm.org.za)
- Asia Pacific International Conference in Travel Medicine (www.apictm.com)
- New Zealand Travellers Health Annual Updates (www.worldwise.co.nz)

UK
- Royal College of Physicians and Surgeons (Glasgow) Faculty of Travel Medicine (www.rcpsg.ac.uk/Pages/default.aspx)
- The Royal College of Nursing (UK) Travel Health Forum (www.rcn.org)
- British Travel Health Association (www.btha.org)
- Royal Society of Tropical Medicine and Hygiene (www.rstmh.org)
- Travel Medicine Competencies - The Royal College of Nursing (UK) Competencies: (www.rcn.org.uk/publications/pdf/travel_health_medicine.pdf)
- Travel Health Related Education and Care TREC Introductory Courses and Updates (www.trectravelhealth.co.uk/)
- Health Protection Scotland: (www.travelcourses.hps.scot.nhs.uk/)
- Health Protection Scotland: The Foundation Course in Travel Medicine and The Diploma in Travel Medicine (www.travelcourses.hps.scot.nhs.uk/)
• MSc/Postgraduate Diploma/Postgraduate Certificate in International and Travel Health, Sheffield, Hallam University, [www2.shu.ac.uk/prospectus/op_pglookup1.cfm?id_num=SCI002&CurrTab=4](http://www2.shu.ac.uk/prospectus/op_pglookup1.cfm?id_num=SCI002&CurrTab=4)
• Graduate Certificate in Travel Health and Medicine and Graduate Diploma in Travel Health and Medicine, Academic Centre for Travel Medicine and Vaccines, University College London ([msctravel.medicine@medsch.ucl.ac.uk](mailto:msctravel.medicine@medsch.ucl.ac.uk))
• London School of Hygiene and Tropical Medicine Short Course in Travel Medicine ([www.lshtm.ac.uk/prospectus/short/stm.html](http://www.lshtm.ac.uk/prospectus/short/stm.html))
• Liverpool School of Tropical Medicine Travel & Expedition Medicine Short Course ([www.liv.ac.uk/lstm/learning_teaching/short_creds/ShortTravMed.htm](http://www.liv.ac.uk/lstm/learning_teaching/short_creds/ShortTravMed.htm))
• London School of Hygiene and Tropical Medicine Diploma in Tropical Medicine & Hygiene (DTM&H) ([www.lshtm.ac.uk/prospectus/short/stmh.html](http://www.lshtm.ac.uk/prospectus/short/stmh.html))
• Liverpool School of Tropical Medicine Diploma in Tropical Medicine & Hygiene (DTM&H) ([www.liv.ac.uk/lstm/learning_teaching/post_grad/DiplTropMedHyg.htm](http://www.liv.ac.uk/lstm/learning_teaching/post_grad/DiplTropMedHyg.htm))
• Travel Health Related Education and Care TREC Introductory Courses and Updates ([www.trectravelhealth.co.uk/](http://www.trectravelhealth.co.uk/))
• Yellow Fever Vaccination Centre Training, National Travel Health Network and Centre (NaTHNaC) ([www.nathnac.org/pro/YFVCTraining.htm](http://www.nathnac.org/pro/YFVCTraining.htm))
• MSc in Travel Health and Medicine, Graduate Certificate in Travel Health and Medicine, Graduate Diploma in Travel Health and Medicine, Academic Centre for Travel Medicine and Vaccines, University College London ([msctravel.medicine@medsch.ucl.ac.uk](mailto:msctravel.medicine@medsch.ucl.ac.uk))
• London School of Hygiene and Tropical Medicine Diploma in Tropical Nursing ([www.lshtm.ac.uk/prospectus/short/stn.html](http://www.lshtm.ac.uk/prospectus/short/stn.html))

US and Canada - Travel Medicine Societies, Courses and Competencies

• American Society of Tropical Medicine and Hygiene ([www.astmh.org](http://www.astmh.org))
• American Travel Health Nurses Association ([www.athna.org](http://www.athna.org))
• Infectious Diseases Society of North America ([www.idsociety.org](http://www.idsociety.org))
• International Society for Infectious Diseases ([www.isid.org](http://www.isid.org))
• An Advisory Committee Statement (ACS), Committee to Advise on Tropical Medicine
• American Society of Tropical Medicine and Hygiene Certificate of Knowledge in Clinical Tropical Medicine and Travelers’ Health ([www.astmh.org/certification/index.cfm](http://www.astmh.org/certification/index.cfm))
• Diploma Course in Clinical Tropical Medicine and Travelers’ Health, Tulane School of
• Public Health and Tropical Medicine, New Orleans, ([www.sph.tulane.edu/tropmed/programs/diploma.htm](http://www.sph.tulane.edu/tropmed/programs/diploma.htm))
• Gorgas Course in Clinical Tropical Medicine ([www.Gorgas.org](http://www.Gorgas.org))
• Clinical Tropical Medicine and Parasitology Course ([www.hsc.wvu.edu/som/tropmed](http://www.hsc.wvu.edu/som/tropmed))
• Tropical & Travel Medicine Seminar Series ([www.tropical.umn.edu/](http://www.tropical.umn.edu/))

Other Countries

• Australia: Australasian College of Tropical Medicine (ACTM) ([www.tropmed.org](http://www.tropmed.org))
• Australia: Postgraduate Diploma of Tropical Medicine and Hygiene (DTM&H), James Cook University, Australia (Email. sphtm-studentofficer@jcu.edu.au)
• Australia: Faculty of Travel Medicine, The Australasian College of Tropical Medicine (www.tropmed.org/travel/index.html)
• Australia: Postgraduate Certificate of Travel Medicine, James Cook University, Australia  Email. sphtm-studentofficer@jcu.edu.au
• Germany: Course in Tropical Medicine and Parasitology, Bernhard Nocht Institute for Tropical Medicine, Hamburg, Germany E-mail: tropmed@bni.uni-hamburg.de
• Germany: Diploma in Tropical Medicine and Public Health (DTMPH) Core Course in the  Masters Programme in International Health, Institute of Tropical Medicine Charite, Medical Faculty of Humboldt University Berlin, Germany. E-mail: itm.studies@charite.de
• Germany: Tropical Society (DTG) (www.dtg.org)
• Germany: RM – Centre for travel medicine (Centrum für Reisemedizin) (www.crm.de)
• Germany: Qualified travel doctors (www.frm-web.de)
• New Zealand: Travellers Health Annual Updates (www.worldwise.co.nz)
• New Zealand: Postgraduate Certificate, Diploma and Masters in Travel Medicine, University of Otago, New Zealand email. (postgrad.wsmhs@otago.ac.nz)
• Thailand: Graduate Diploma in Tropical Medicine and Hygiene (DTM&H), Bangkok School of Tropical Medicine, Faculty of Tropical Medicine, Bangkok (www.tm.mahidol.ac.th)
• Swiss International Short Course, Travellers’ Health (1 week). Annual course held at the Swiss tropical Institute every January 09 (www.sti.ch)

Travel Medicine Key Texts

Travel Medicine Reference Texts
• International Travel and Health (2005). World Health Organization (WHO). (Available at: www.who.int/ith)
• Health Information for International Travel 2008. Centers for Disease Control and Prevention (CDC); Elsevier Mosby. (Available at: www.elsevierhealth.com)
• Primer of Travel Medicine. 3rd Revised edition, Leggat PA, Goldsmid JM. (eds) Brisbane: ACTM Publications, 2005. (Email actm@tropmed.org)
• The Travel and Tropical Medicine Manual. 3rd edn. Jong EC, McMullen R, eds. UK: W.B. Saunders; 2003. (Available at: www.us.elsevierhealth.com)
• Health Information for Overseas Travel (2001). 2nd edn. [Currently being revised]. Department of Health; The Stationery. UK NaTHNaC. (Available at: www.nathnac.org)
• International Travel and Health (2005). World Health Organization (WHO). (Available at: WHO On-line International Travel and Health (The Green Book www.who.int/ith/)
• Travelers’ Malaria. 2nd edn. Schlagenhauf, P. Ontario: Decker; 2007. Available at: (www.bcdecker.com)
• Health Canada Travel Medicine Program Information for Professionals(www.phac-aspc.gc.ca/tmp-pmv/prof_e.html)
• World Atlas!
Immunization and Malaria Texts

- Travelers' Vaccines. Jong EC, Zuckerman JN eds. BC Decker; 2004
- US CDC Malaria page (www.cdc.gov/malaria/)
- US Vaccine Information Statements for Patients (www.cdc.gov/vaccines/pubs/vis/default.htm)
- Epidemiology and Prevention of Vaccine Preventable Diseases (The CDC Pink Book) (www.cdc.gov/nip/publications/pink/)
- International Travel and Health (2005). World Health Organization (WHO). (Available at: www.who.int/ith)
- www.who.int/vaccines/GlobalSummary/Immunization/ScheduleSelect.cfm
- www.who.int/imunization/en
- Immunisation Against Infectious Diseases (2006). 3rd edn. Department of Health (Joint Committee on Vaccination and Immunisation); HMSO. (Available at: www.dh.gov.uk/en/PublicHealth/HealthProtection/Immunisation/Greenbook/DH_4097254)

Pharmacopoeias

- World Health Organization (www.who.int/druginformation/)

Tropical Medicine

• Pictorial Presentation of Parasites by Herman Zaiman (astmh.org/Policy/zaiman.cfm)

**Government Travel Advisories**

- International Health Regulations 2005 (www.who.int/csr/ihr/en/)
- US Centers for Disease Control and Prevention - Travel (www.cdc.gov/travel)
- US Department of State: Information for Americans Traveling Abroad (www.travel.state.gov/travel/tips/health/health_1185.html)
- Maison des français de l’étranger (www.mfe.org/)
- CIMED(comité d’information médicales) (www.cimed.org/)
- Canada Consular Affairs Bureau (www.voyage.gc.ca/consular_home-en.asp)
- Australia Dept Foreign Affairs & Trade (www.smartraveller.gov.au/zw-cgi/view/Advice/)
- Overseas Security Advisory Council (OSAC) U.S. Department of State Safety (www.osac.gov/)
- Foreign Affairs and International Trade Canada (www.voyage.gc.ca/consular_home-en.asp)
- National Travel Health Network and Centre (NaTHNaC) (www.nathnac.org/)
- Health Protection Agency England, Wales, Northern Ireland (www.hpa.org.uk/)
- Health Protection Scotland (www.hps.scot.nhs.uk/)
- Swiss federal Office of Public Health (German) www.bag.admin.ch/infekt/reise/d/index.htm

**Travel Medicine Related Journals**

- Journal of Travel Medicine (www.istm.org/publications/jtm.aspx)
- ISTM NewsShare (www.istm.org/publications/newsshare.aspx)
- Travel Medicine and Infectious Diseases
- American Journal of Tropical Medicine & Hygiene
- British Medical Journal
- Bulletin WHO
- Clinical Infectious Diseases
- Emerging Infectious Diseases
- Journal of Infectious Diseases
- The Lancet
- The Lancet Infectious Diseases
- Journal of the Faculty of Travel Medicine, Royal College of Physicians and Surgeons of Glasgow, UK
- Transactions of the Royal Society of Tropical Medicine & Hygiene
- Tropical Medicine and International Health
- Vaccine
- The Southern African Journal of Epidemiology and Infection

**Travel Medicine Databases and Forums**

- PubMed (www.ncbi.nlm.nih.gov/pubmed/)
- TravelMed (www.istm.org/listserv.asp)
- Pro-Med (www.promedmail.org)
### 3.3.8 Disease Outbreak Reports

- ProMED-Mail International Society for Infectious Diseases ([www.promedmail.org/](http://www.promedmail.org/))
- Weekly Epidemiological Record WHO ([www.who.int/wer/en/](http://www.who.int/wer/en/))
- Infectious Disease Weekly Report, Infectious Disease Surveillance Center, Japan ([idsc.nih.go.jp/idwr/index-e.html](http://idsc.nih.go.jp/idwr/index-e.html))
- WHO Global Atlas ([www.globalatlas.who.int](http://www.globalatlas.who.int))
- Communicable Disease Control in Northern Europe ([www.epinorth.org/](http://www.epinorth.org/))
- The World Organisation for Animal Health (OIE) ([www.oie.int/eng/eng_index.htm](http://www.oie.int/eng/eng_index.htm))

### Surveillance Networks

- GeoSentinel ([www.istm.org/geosentinel/main.html](http://www.istm.org/geosentinel/main.html))
- TropNetEurop ([www.tropnet.net/](http://www.tropnet.net/))
- Weekly Epidemiological Record (WHO) ([www.who.int/wer/en/](http://www.who.int/wer/en/))
- EuroSurveillance (European information on communicable disease surveillance and control) ([www.eurosurveillance.org/](http://www.eurosurveillance.org/))
- WHO Global Health Atlas ([www.who.int/globalatlas/](http://www.who.int/globalatlas/))
- Bulletin Epidémiologique Hebdomadaire ([www.invs.sante.fr/beh](http://www.invs.sante.fr/beh))
- European Travel and Tropical Medicine Network ([www.eurotravnet.eu](http://www.eurotravnet.eu))

### Disease Mapping

- WHO Global Health Atlas ([globalatlas.who.int](http://globalatlas.who.int))
- Healthmap ([www.healthmap.org/en](http://www.healthmap.org/en))

### Subscription Travel Health Advisory Services

- Exodus ([www.exodus.ie](http://www.exodus.ie))
- GIDEON (Global Infectious Diseases Epidemiology Network) ([www.gideononline.com](http://www.gideononline.com))
- International SOS Online Country Guide ([www.internationalssos.com/online](http://www.internationalssos.com/online))
- Travax and Travax Encompass (US) ([www.shoreland.com](http://www.shoreland.com) and [www.tripprep.com](http://www.tripprep.com))
- Travax (Health Protection Scotland) ([www.travax.scot.nhs.uk](http://www.travax.scot.nhs.uk))
- TropiMed ([www.tropimed.com/ANG/home.htm](http://www.tropimed.com/ANG/home.htm))

### National Travel Health Advice Lines for Health Professionals

- National Travel Health Network and Centre +44 20 7380 9234
- Malaria Reference Laboratory (malaria queries only) +44 20 7636 3924
• TRAVAX (available to subscribers only) + 44 141 300 1130
• Centers for Disease Control and Prevention Travel 1-800-CDC-INFO; 1-800-232-4636; 1-888-232-6348 (TTY) E-mail: cdcinfo@cdc.gov
• CDC Malaria Hotline: 1-770-488-7788; 1-770-488-7100
• Divers Alert Network (www.diversalertnetwork.org/)

Information available from the center, for travelers? What centre resources are available for intending travelers? Are there any brochures or handouts?
• Travel Medicine Inc; 2006. Available at: (www.travmed.com)
• Travelers Health – How to Stay Healthy Abroad. 4th edn. Dawood R. Oxford University Press; 2002. (Available at: www.oup.com)
• The Lonely Planet, ‘Healthy Travel’ Series. Young I. 2000. (Available at: www.lonelyplanet.com)

National Travel Medicine Websites – Health Professional and Traveler centered
• Centers for Disease Control and Prevention (CDC) (USA) (www.cdc.gov/travel/default.aspx)
• Fit for Travel (Health Protection Scotland) (www.fitfortravel.scot.nhs.uk)
• National Travel Health Network and Centre (NaTHNaC) (www.nathnac.org/travel/index.htm)
• University Hospitals of Geneva (www.safetravel.ch)
• Fit-for-Travel from the University of Munich (www.fit-for-travel.de)
• Institute for Tropical Medicine in Antwerp (www.itg.be)
• Travel Health Advisory Group, Australia (www.welltogo.com.au)
• Centre Hospitalier Universitaire Toulouse (www.chu-toulouse.fr)
• Centre Hospitalier Universitaire Rouen (www.chu-rouen.fr)
• Institut Pasteur de Lille (www.pasteur-lille.fr)
• Assistance Publique Hôpitaux de Marseille (www.mit.ap-hm.fr)

Commercial Websites offering Travel Advice
• Travel Health Online (www.tripprep.com/scripts/main/default.asp)
• Lonely Planet (www.lonelyplanet.com)
• New Zealand – Worldwise Travellers Health Centres (www.worldwise.co.nz)
• Travel Medicine, Inc., Massachusetts, USA (www.travmed.com)
• GSK Malaria Hotspots (www.malariahotspots.co.uk)
• Bloodcare Foundation (www.bloodcare.org.uk)
• Marie Stopes International (www.mariestopes.org/Countries_we_work_in/Countries.aspx)
• Travel Medicine, Inc., Massachusetts, USA (www.travmed.com)
• The TravelDoctor TMVC Australia (www.tmvc.com.au/alert.html)
• GSK Malaria Hotspots (www.malariahotspots.co.uk)
• Travel Health Online (www.tripprep.com/scripts/main/default.asp)
• Medical Advice Service for Travelers Abroad (MASTA). (www.masta.org/)
• South Africa - The Travel Doctor (www.traveldoctor.co.za)
• South Africa - Worldwide Travel Medical Consultants (www.wtmconline.com)

Travel Health Handouts
• Multiple language handouts (www.tropical.umn.edu)
• US Vaccine Information Statements (VIS) for Patients (www.cdc.gov/nip/publications/VIS/default.htm)

Travel Health Physicians Worldwide
• International Association for Medical Assistance to Travelers (IAMAT) – Global Physician's Directory and Malaria and Immunization Guides (www.iamat.org)

Government Consular Advisory Services
• US State Department Services Safety travel warnings from the US. (www.travel.state.gov/travel/travel_1744.html)
• Overseas Security Advisory Council (OSAC) U.S. Department of State Safety (www.osac.gov/)
• British Foreign and Commonwealth Office (www.fco.gov.uk)
• Foreign Affairs and International Trade Canada (www.voyage.gc.ca/consular_home-en.asp)
• Australian Department of Foreign Affairs and Trade (www.smartraveller.gov.au/tips/travelwell.html)
• Foreign Affairs and International Trade Canada (www.voyage.gc.ca/consular_home-en.asp)
• New Zealand Ministry of Foreign Affairs and Trade (www.safetravel.govt.nz/)
4. MARKETING AND INCOME STREAMS

Semone Statton, Practice/Marketing Manager, Travel Clinics Australia-The Travel Clinic-Brisbane

Marketing in travel health is essential for growth within the business, or any business that wishes to be seen in the market place. Without marketing consumers (patients) are unaware of products and services, where and how access them? Marketing allows you to communicate (reach) to these patients and inform them of your services, creating interest in your products and services, that will ultimately lead to patients making appointments and attending your clinic.

There are many ways to market your clinic. Marketing need not be an expensive exercise. It could be as simple as a brochure, newsletter or as elaborate as using an advertising agency to produce your materials and include the use of multi media.

Before you start marketing you need to research your local environment, define your product(s) and service(s), patients, competitors and the like.

I have chosen to focus my work by utilizing headings that outline the format of the marketing implementation. By applying these headings to your individual clinic you will start to formulate and secondarily implement your own individual marketing strategy to i) gain a better understanding of your local environment and ii) get your services ‘out there’ for all to experience.

How to Market-The Marketing Plan!
If you don’t plan, you plan to fail!
The marketing plan is an outgrowth of the Marketing Analysis section of the business plan. All intending business folk need to develop their own business plan. There are many guidelines to do this and this aspect is beyond the scope of this paper.

Implementing the Marketing Plan
“The how to guide” – tried and tested........

Articles
- Publish articles to market yourself and your travel clinic
  - Local newspapers, medical journals, local divisions of General Practice, ISTM etc....

Awards
- Publicize your business/medical awards. Inform the press about your achievements
- Hang your diplomas, certificates & awards in the reception area
- People like to deal with winners! Impress your patients!

Brochures/Fliers
- Represent your clinic, image, brand and convey clearly what it is that the clinic does and what it offers. Include your website address

Budget
- Make sure that you have a marketing budget and stick to it!
- 80% of your marketing budget should be spent on existing patients
- 20% of your marketing budget should be spent on generating new patients
- Track the return on your investment by tabulating referral sources of your patients

Business Cards
- Represent your business, image and brand - Include your website
- Use a quality stock (paper), as this will reflect your image & brand
- Make up business cards for your staff (including receptionist staff) and make them the same quality as your own-Don’t skimp!

Confirmation Calls
- Have the receptionist phone patients to confirm the travel clinic consultation appointment time, clinic address and advise them of local parking
Coupons (discount)
- Offer a “discount” during off season travel times IE: 10% off the cost of vaccinations
- Provide an industry discount card to travel agents
- Provide a consumer discount at trade shows

Co-Op Advertising
- Advertise with local businesses/service providers/retailers to reduce advertising costs
  IE: The local pharmacy/chemist/allied health care providers/travel agents

Customer Service
- Exceed your patient’s expectations from the minute they arrive to the minute they leave!
  Understand their wants and needs and satisfy them

Customer Surveys
- Provide your travel patients with surveys to find out what they think about your clinic, your service, staff and products? What were their likes and dislikes? What else would they like you to offer?

Demonstrations
- Demonstrate your products to your patients IE: first aid kits, water purification devices and tablets, hand sanitizing gels and the like

Direct Mail/Email/SMS
- Make a database of patients (past & present), travel agents, referring General Practitioners, consulates, embassies, airlines, corporate and government (with their consent) and keep in touch with them. Send them (direct mail or email) newsletters, special promotions, complimentary trade show tickets, promotional items etc
- SMS appointment reminders, vaccinations reminders, welcome home messages etc

Directories
- Advertise in directories IE: White Pages/Yellow Pages/TrueLocal.com.au, ISTM
  Include on line directories/listings

Displays
- Display your products so that your patients can “touch and feel” them IE: first aid kits, repellents, waterless hand gels etc

Driver
- Every travel medicine clinic needs a “driver”, someone who is passionate about travel medicine and has the skills to direct, manage and market the clinic and has a clear vision of where the travel clinic is going

Expanded Business Hours
- If your travel clinic is open longer than standard business hours communicate this to your patients, potential patients and referral sources

Grand Opening
- If your travel clinic is new/re vamped plan a grand opening, invite current and prospective patients, travel agents, the media, major stake holders within the travel industry and pharmaceutical representatives/managers

In Clinic Training
- Train your staff, Doctors, nurses, management and reception staff on the different products available in the clinic

Internet! Internet! Internet!
- Website
- Search engines-use key words
- Website links
- Paid Internet advertising/listings e.g: Google. Monitor this continually as the internet changes continually

Location! Location! Location!
- Is your travel clinic conveniently located?
- Can patients easily find your travel clinic?
• Do you have convenient parking?

Logo
• The image that identifies your travel clinic to the public, provides a brand and an identity
• Brand with your logo on all stationary, uniforms, patient questionnaires, patient information and newsletters

Networking
• Local Business Groups IE: Australian Business Travel Association (ABTA), local chamber of commerce etc
• Tourism groups
• Religious groups

Newsletter
• Create a newsletter for your travel clinic. Distribute this to new travel clinic patients, as well as past, (existing patients if you have a general practice as well) travel agents, airlines, embassies, consulates, corporations and government
• Directly mail this to them or email it to them

Passion
• Everyone who works in your travel medicine clinic should be passionate about preventative medicine, travel and health
• Passion cannot be manufactured

Perception, Perception, Perception
• Marketing is all about perception, the perception that your patients have of your clinic
• Make a lasting impression
• Make your clinic enticing, interesting and professional—Think retail

Promotional Items
• Magnets, mouse pads, stickers, balloons, pens, post it notes—think like a pharmaceutical company! BRAND IT!

Signage
• Visible, simple and direct. Include your logo and website address

Tradeshows
• Travel Agent/Wholesaler Travel Expo’s
• Health Expos
• Provide free samples and demonstrations IE: first aid kits, water purification devices, sanitising gels etc
• Complimentary International Certificate of Vaccinations books that are branded to your clinic

Word of Mouth (WOM) Advertising
• Is priceless! Exceed every travel patient’s expectation’s, they will do your marketing for you, they will tell family, friends and colleagues
• Patients who have a positive experience at your clinic will tell at least 3 other people
• Patients who have a negative experience will tell at least 10 other people
• To counter act 1 negative experience, it takes 10 positive experiences
• Only 3% of patients who are unhappy about their experience will actually verbalise/write a complaint

Further Marketing Techniques
• Advertorials—Paid advertisements in newspapers/magazines
• Barter—Trade your goods and services for other people’s goods and services
• Billboards—(outdoor advertising) Keep your message to seven words or less, and include your phone number and web address.
• Bulletin Boards—Place your business card at the local restaurants and other businesses
• Charities—Volunteer your time and donate products
• Contests-Tradeshows, travel agents & patients IE: Win a travelers first aid kit, make sure that you include what the prize is worth in dollars
• Patient loyalty programs –offer loyal travel clinic patient’s complimentary items. These should not exceed 3-5% of the total expenditure

Who to Market to:

Geographical Marketing-ABC-This will depend on your clinic location and local population
• Area A-5km radius- Local Area Marketing (LAM)
• Area B-10km radius
• Area C-15km radius

Market Segmentation

General Public
• Y Gen
• X Gen
• Baby Boomers

Government
• Human Resources Departments
• Work Place Health & Safety Officers
• Opinion leaders

Corporate/Private
• Human Resources Department
• Work Place Health & Safety Manager/Officers
• Opinion leaders

Aid/Humanitarian/Not for Profit Organisation
• Human Resources Department
• Work Place Health & Safety Manager/Officers
• Group/team leaders
• Opinion leaders

Religious groups
• Capture those visiting friends and relatives (VFR’s)
• Find “opinion leaders” to help convey your message

Travel Agents, Travel Agent Groups e.g: Flightcentre and Travel Industry Wholesalers
• Offer key industry members an incentive to use your service IE: an industry discount, 10% off the cost of vaccinations. Key industry members are more likely to refer clients to you, if they have personally used your service and had a favorable experience.

Travel Agent Representative
A full time travel agencies representative can be very expensive, but some representatives take on a portfolio of products, thus decreasing the expense depending on the product portfolio. Another alternative is to use a staff member from your clinic to visit and promote your services. As the travel agent industry generally tends to be a “high turnover” industry these visits need to be frequent.

General Practitioners
• Not all general practitioners like to provide travel health and vaccination advice and are quiet happy to refer to patients to a travel clinic. Find out who these Doctors/clinics are and consider providing referral pads to them.
• Ensure that when they do refer patients to you that you send a thank you letter and provide them with a list of vaccinations and medications that you provided to their patient.
• Ask all of your travel patients if they would like you to send their General Practitioner an outline of what vaccinations & medication that they have been given during their
consultation so that they can update their files? (this can be asked on the patient questionnaire).

**Pharmacies/Chemist**
- Send them letters informing them of your clinic and the services that you provide (direct mail campaign) include clinic fliers, referral pads, magnets, current newsletter etc

**Embassies/Consulates/Airlines**
- Send them letters (direct mail) informing them of your clinic and the services that you provide (direct mail campaign), include clinic fliers, referral pads, magnets, current newsletter etc

**Marketing Results-Measurement!**
- **Track all patients** “How did they find out about your clinic?”, “Where did they locate your clinic’s phone number?” (This can be included on your patient questionnaire. Tabulate this information). This will show you emerging markets and identify where you should be spending your marketing budget and where not to.

**Resources/References**
Gerson RF, Writing and Implementing a Marketing Plan. Crisp Publications 1991
5. POLICIES, PROCEDURES AND QUALITY CARE
Lynne Bunnell, Manager for International Health, Citigroup Health Services

“Clear policies and procedures have a profound effect on an organization.
Systems operate properly.
People operate properly.
We all get the information we need clearly and quickly.”

Introduction
Policies and Procedures are an essential part of your clinic and help you to operate your travel health services within the current practice-specific standards of care. New staff members will learn, through reading the policies and procedures, what is expected of them in providing pre-travel care that is consistent, resource-based and safe.

Who sets the standards for travel health care?
In the United States, the CDC, Centers for Disease Control, (www.cdc.gov) sets the standards of care which are found in the Traveler’s Health section of its website. In some other parts of the world, the WHO, World Health Organization (www.who.int/ith) is the standard setting organization. In Canada, CATMAT, the Committee to Advise on Tropical Medicine and Travel, is the resource (www.phac-aspc.gc.ca/tmp-pmv/catmat-ccmtmv/). The first step in setting up a travel health care practice is to research the resources in your practice location, since vaccine availability/schedules and treatment standards do vary from country to country.

The International Society of Travel Medicine has developed a written body of knowledge for the practice of Travel Medicine (SECTION 1.2), “created to guide the professional development of individuals practicing travel medicine and to shape curricula and training programs in travel medicine.”

In some areas of the world, there may not be specific guidance on some travel health topics. Some of the highly respected information resources include:

- CDC Yellow Book Health Information for International Travelers (Yellow Book) which can be downloaded from the CDC web site or ordered in hard copy from Elsevier www.elsevierhealth.com (800) 545-2522
- CDC Epidemiology and Prevention of Vaccine Preventable Diseases (Pink Book) which can be downloaded at: http://www.cdc.gov/vaccines/pubs/pinkbook/default.htm or ordered in hard copy from the Public Health Foundation (877) -252-1200
- International Travel and Health (Green Book) from The World Health Organization, which can be downloaded at www.who.int/ith
- Travel and Routine Immunizations (Blue Book), Richard Thompson, Editor which can be ordered from: Shoreland, Inc. (www.shoreland.com 1-800-433-5256)

Once you have reviewed the current travel health care guidelines and resources to support your practice, then you can proceed to write your site-specific policies and procedures.

Policies
Policies are statements that establish an organization’s position on a particular issue – the “What” and “Why” of the travel clinic operation – and are reflected in procedures based on current travel health standards of care. Policies are specific to the provider group and are developed by the group to define and advance the practice plus provide a framework for evaluation. Written policies are authoritative statements by which the profession describes the responsibilities for which its practitioners are
accountable. Policies are dynamic and evolve over time to reflect the changing scope of practice and development of new knowledge.

Procedures
Nancy J. Campbell says, “If policies are the organization’s guidelines, [then] procedures are its workhorses.” Procedures define the specific actions needed to accomplish a particular task or set of tasks - the “How to.” It is insufficient to say, “I want to give the best travel health care.” It is necessary to record exactly how your personnel will provide that service. Written procedures are needed to accomplish tasks and for any issue that is important and benefits from clarification. Procedures are essential for a quality program that reflects the organization’s philosophy and define a safe and consistent way for all caregivers to complete the process. They may also serve as “standing orders” for nursing staff to practice with MDs in many locations. Just as you need to document patient appointments, documenting what you do in your clinic is important. If it is not written you have no proof that things are supposed to happen that way.

Policies and Procedures (P&P)
Clear policies and procedures enable standardized orientation of new employees. They demonstrate, legally, compliance with the current standards of care in the field. They provide a written description that can be modified as needed through evaluation of newly published standards and local policy changes. Practically-speaking, policies and procedures lead the way for others, save time and money, help eliminate mistakes, increase efficiency and ease worker frustration.

Some examples of policies are:
- Job prerequisites and responsibilities
  (What does each staff person do at your site? What are the job limits?)
- What are the vaccines given, and the schedules?
  (Based on researched information and manufacturer’s inserts with references)
- Examples of procedures include:
  - What to ask in the assessment interview?
  - How to deal with anaphylaxis
  - Steps to take to maintain the cold chain when receiving and storing vaccines
  - How to administer vaccines
  - Quality assurance evaluation

How do you start writing policies and procedures for your clinic?
As already noted above, first you must research and know the travel health standards where you practice. Then you need to assemble your reference materials. Identify standards as they affect your type of practice since doctor and nurse standards may vary.

Make a list of everything you and your staff members do in your clinic (scope of your practice) and then organize and prioritize your list. Base the actions on written standards in your country/organization and start writing policies and procedures with just one document that matters to you. By doing just one piece at a time, you will not be overwhelmed by the enormity of the job of writing all the policies and procedure you will need.

Include administrative as well as clinical concerns in your final manual. The goal is to have user-friendly documents with all the information in one place (in a notebook or on the computer) including:
- Table of contents for the P&P manual
- Introduction including citations, mission statement, reference materials
- Information geared to the specific clinic clientele
- Training guidelines for new staff
- Resources about vaccines including vaccine information statements (VIS)
- Information about vaccine administration
How to deal with anaphylaxis
- Antimalarials and prescriptions used in pre-travel care
- Guidelines for dealing with telephone calls and emails from clients
- Instructions for scheduling appointments
- Pre-travel consultation overview
- Country-information resources to identify individual traveler travel health needs
- Teaching tools to help simplify education and provision of patient care
- Forms and handouts
- Details of documentation – medical records and client immunization documents
- How to plan follow-up visits
- Resources

Much of the information may already be available from the resources you have identified so you will not need to write everything completely.

Format for Policies and Procedures
In order to make it easier for readers to understand and implement the information, each policy and procedure should include:
- Name of P&P
- Date issued/revised
- Define the scope of the individual policy or procedure
- Describe the purpose
- Identify who are the key people involved
- List any necessary supplies needed
- Procedure with key points
- Documentation considerations
- Approval signature
- References

Keep in mind that your approach needs to be practical - Nurse to nurse, Doctor to doctor, a template that works for you and your group. Note that the format does not have to be rigidly adhered to, however. In some cases, a flowchart approach or algorithm will work better (for example with decision-making on vaccines or choice of malaria medication). Just decide on the best format for your group and consider that you may use several formats in the same manual. Written examples of policies and procedures for travel health care in the United States may be viewed at www.athna.org (The American Travel Health Nurses Association).

Evaluate and revise
Once you have written your documents, have them reviewed by other staff members and also consider legal review. Once the content is agreed upon, add the approval signature of the site medical director. Set up a schedule for reviewing the policies and procedures so that they can be updated regularly as information and/or practice needs change.
6. INDEMNITY AND PERSONAL PRACTICE INSURANCE

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**INTRODUCTION**

Medical indemnity cover is the insurance that health professionals and practices purchase to provide coverage for claims made by patients against them for medical negligence and for legal assistance if health professionals are involved in investigations, such as coronial inquiries. This chapter will cover the need to have written policies, guidelines and protocols for their practice of travel medicine. It will also discuss the need to keep to the training and practice standards maintained by the profession. It will also emphasize the need for documentation of treatment and advice, but also the need for this advice to be communicated effectively. Travel health advisors need to be aware that incidents and errors should be responded to promptly and appropriately and advice sought from insurance companies.

**POLICIES AND GUIDELINES**

As discussed in the previous chapter, it is essential that the practice of travel medicine is based on current policies and guidelines and that the provision of travel health advice is subject to quality assurance. The World Health Organization (WHO) provides both International Health Regulations (IHR) (WHO, 2005) and guidelines for travel medicine (WHO, 2008). Each country will generally also have its own policies and guidelines, which may be regional consensus documents, e.g. such as those provided in South East Asia for malaria (Looareesuwan et al, 1998). These documents are important as they contribute to the standard of practice upon which practitioners in the field of travel medicine will be judged again. Some examples of these policies and guidelines are listed in Table 1.

**International policies and guidelines**

The IHR, adopted in 1969, amended in 1973 and 1981 and completely revised in 2005 (WHO, 2005) provide the legal framework, which have specific requirements for certain travelers. It is important for clinicians to be aware of the legal provisions within the IHR and what the implications for travel medicine practice are. The IHR deals with identification and response to public health emergencies as well as public health actions at international ports, airports, and ground crossings including health documentation (Hardiman et al., 2007). Most importantly, they relate to who requires yellow fever vaccination and provides the basis for the establishment of yellow fever vaccine centres (Leggat et al., 2003b). Although states will not have a legal obligation to follow these recommendations, experience has shown that there is a high degree of concurrence with timely and relevant guidance issued by the WHO, particularly in respect to preventing international disease spread. The WHO also produces international guidelines for travel medicine practice.

**National Policies and guidelines**

Comprehensive guidelines in travel medicine are issued by a number of countries. Perhaps one of the best known of these are those produced by the Centres for Disease Control and Prevention in the USA. There are also a number of other well known national guidelines, many of which are made available on the internet. Travel health advisors must have access to current national policy guidelines and up-to-date health intelligence, such as that provided in national and international travel advisory services.

**Practice policies and delegations**

Protocols, policies and guidelines describe the care and treatment the travel medicine practice intends to provide. As running a travel health clinic often involves the administration or prescription of prescription only vaccinations and medications, it is advisable to have written (and up to date) protocols or policies covering these, including dealing with emergencies. A protocol will also address the issue of competence and accountability and provide documentary evidence of appropriate delegation by the medical practitioner and acceptance of that delegation by the practice nurse and other practice staff. A protocol
will also assist in defining the roles and responsibilities of the individuals involved in providing care and will enable them to exercise the accountability required by their own respective registration bodies.

ACCREDITATION AND CONTINUING PROFESSIONAL DEVELOPMENT

Registration and competencies
Registration of all practice health professional staff is essential by their respective registration authorities. Registration should be maintained for all countries, states and territories, where the practice staff propose to practice travel medicine. This registration may be basic and specialist, where specializations exist relevant to travel medicine practice. A number of professional groups now assess and examine competencies in travel medicine. The International Society of Travel Medicine (ISTM) has taken the lead in establishing a global professional base for travel medicine. The ISTM has developed a detailed Body of Knowledge (section 1:2) in travel medicine leading to a Certificate of Travel Health™ (Kozarsky et al., 2002). There are also several professional medical colleges that have developed a Faculty of Travel Medicine, including the Australasian College of Tropical Medicine (Leggat et al., 2004) and the Royal College of Physicians and Surgeons of Glasgow (Zuckerman, 2007), that recognize professional achievements and provide a code of ethics and standards for practitioners.

Continuing Professional Development
In order to remain competent, the travel health practitioner needs to keep up-to-date and undertake continuing professional development (CPD). The standard of clinical practice in travel medicine will be judged in the case of a insurance or civil claim by the knowledge and standards that were available at the time the patient was treated. No travel health adviser is expected to know everything, but they are expected to act with reasonable care and due diligence to the level of their particular skills and training. Competence and skill consists of both practical ability and a sound knowledge base. Ignorance is never a defense. While regular conferences and updates are useful as are reading journals, professionals also need to be exposed and challenged by new knowledge and practices and some form of assessment in CPD can be useful for this purpose, e.g. reaccreditation of cardiopulmonary resuscitation skills.

PRACTICE ISSUES

Professional indemnity insurance
As much of travel medicine in many countries is practiced in general practice and may be doctor driven, professional indemnity may largely be covered by professional indemnity for general practitioners. None-the-less, whether working in travel medicine in a general family practice or travel clinic, it would be useful for staff to contact the insurer to ensure that all aspects of their practice are covered, in particular any travel medicine practice away from the clinic, e.g. with expeditions or adventure tours. Insurance needs to extend to all members of the practice staff and insurers may be interested in the protocols, policies and procedures that travel health advisors have in place in their clinics.

Written Consent
While the use of consent forms is becoming quite widespread practice these days, asking the patient to sign a consent form is of secondary importance compared to ensuring that enough information is given to the patient and that they understand and consent freely. The amount of information that is provided is a matter of clinical judgment and for the travel health advisor to decide, but it should include significant side effects, risks and any alternatives, including the option of doing nothing. The travel health advisor should take reasonable steps to ensure the traveler understands the information provided. This might include ensuring that the material provided is in their language and by giving them enough time to consider the information given; hence it is important to involve all practice staff in this process.

“Off label” vaccine and pharmaceutical use
Vaccines and pharmaceuticals may be provided to travelers for an indication that is not the one for which the vaccine or drug is registered for, e.g. in some countries, the oral cholera vaccine may not be licensed
for use to prevent Enterotoxigenic *Escherichia coli* (ETEC), but it may be used for the latter. Whenever giving a vaccine or a drug that is unlicensed or unlicensed for a particular indication, it is important that the patient understands the implications of its unlicensed status and the risks and benefits of the preventive measure or treatment in order to give informed consent.

**Practice Policy on telephone advice and follow-up**
Not all travel clinics or general practices have practice policies on telephone advice and follow-up (Leggat et al., 1998). The travel health advisor must decide how much advice if any is provided by telephone to prospective clients. It is important for travelers to be seen by the travel health advisor as part of the travel health consultation, as it is not possible to conduct all aspects of a consultation by telephone in all cases. Similarly, travelers should be made aware of when to seek advice following return from abroad, e.g. should they become ill abroad then ‘what do they do’ or if they become ill on return.

**INTERNATIONAL PRACTICE ISSUES**

**In-flight and overseas emergencies**
Travelers and travel health advisors may find themselves in situations where a fellow traveler, they, or a member of their family require basic first aid or more advanced treatment. Occasionally, a medical or first aid kit may be available, e.g. on board an aircraft. Some travelers are concerned about the medico-legal implications of rendering first aid, especially internationally or outside of their area of registration. Health professionals and other travelers with first aid knowledge are covered under international ‘Good Samaritan acts’ (Leggat et al., 2003a), which includes provisions for rendering assistance and first aid in an emergency (Kirkpatrick, 2002). In fact, if one has a current first aid certificate and fails to render first aid the legal and ethical principle of ‘duty of care’, which enjoins any person with skills to use these to prevent the suffering or death of another, then this may serve as a judgment (Reiser, 1994). A survey of members of the International Society of Travel Medicine, a number of years ago, suggested that only 43% of surveyed physicians would always offer emergency medical assistance, although 72% had rendered ‘Good Samaritan’ assistance at some stage (DiMaggio et al., 1994). To date, it appears that no one has been successfully sued for undertaking a “Good Samaritan” act.

**Expeditions**
Travel and expedition companies and groups actively recruit physicians onto their trips abroad by offering substantial discounts. In general, physician’s malpractice liability insurance would not cover them on such trips. The adventure travel companies asked for some legal opinions, and found that if the doctor accepts a discount for the trip, this makes them an employee of the company, and therefore liable for the care given. This could negate the “Good Samaritan” interpretations of a health professional or a first aid trained member of the public offering care in good faith (Parker, 1998). It is highly recommended that travel health adviser who are asked to accompany an expedition review the malpractice environment where care will be delivered, confirm the medical coverage, get legal opinions on expeditioner release forms, and assess the medical liability associated with the planned undertaking. In general, health professionals are required to keep a medical record of any prescription or treatment rendered anywhere (Parker, 1998). Travel health advisors who are paid to provide care to a group have increased liability and must ascertain the level of malpractice coverage. Even then, the insurer may limit coverage to a specified group, leaving the physician unprotected.

**Occupational and expatriate issues**
Travel health advisors may be faced with providing advice to travelers who are going to work as expatriates abroad. Considerations will vary with jurisdictions obviously, but in general the concept of “duty of care” that employers have towards their employees also comes into play. The employer is obliged to take the best possible care of his employees, and not expose them to unnecessary hazard. These objectives may come into conflict at times when it comes to expatriate postings, particularly where evacuation of the employee may be required, when there are cost implications for employers and where the well being of the employee may compromised in such a
situation if aeromedical evacuation (AME) is delayed or not possible for various reasons. An additional consideration arises if the employee is under consideration for posting to a critical position, when fellow employees and facilities may be placed in jeopardy in the event of critical employee illness. Apart from referring the traveler for more formal occupational health assessments, the employee with critical health issues should be advised in knowing that it is not in their best interests to accept an overseas posting, and to advise the employer of the employee’s lack of fitness for the posting.

Travel insurance
While some countries, such as Australia and New Zealand, have negotiated reciprocal health agreements to cover emergency care of their citizens and residents abroad, these agreements do not usually cover more than a relatively small number of countries. In the event of a major medical problem, a traveler would most likely still need AME to an appropriate medical facility or possibly back home. It therefore seems prudent for travelers to be advised to take out travel insurance appropriate for the state and cost of the health facilities and cost of repatriation for the destination. Travel health advisors should be very cautious about signing “fit to travel” disclaimers from travel insurers or employers.

Travel insurance normally underwrites travel, medical and dental expenses incurred by travelers abroad under conditions specified by the travel insurance policy (Leggat et al., 1999). In addition, travel insurance companies often provide a service, usually through their emergency assistance contractors, to assist travelers abroad. This may include telephone advice, assisting with medical care while overseas, or even AME (Leggat et al., 2005). Use of the emergency telephone service provided by the travel insurance company was reported in almost one fifth of claims in a study of travel insurance claims in Australia (Leggat et al., 2002; 2005). Travel insurance remains an important safety net for travelers and should continue to be an important topic for discussion in the pre-travel health consultation.

REGULATION: COMPLAINTS, ERRORS AND CLAIMS

Malpractice or the practitioner with problems
Travel health professionals who not meet required standard of practice in travel medicine should not be employed. Persistent issues relating to malpractice, where or not there have been complaints, could jeopardize practice insurance and reputation. Concerns regarding systematic problems relating to malpractice may need to be discussed with professional and registration bodies. Concerns regarding alcohol and other drug use, mental problems or criminal matters should be notified to the appropriate agency or group. Peer support groups offered by some professional organisations may also be useful for early stage issues.

Complaints
The most frequent events that give rise to complaints are failure to diagnose or to treat, which is mostly relevant for the post-travel consultation, and medication errors. Complaints or claims about travel health may allege a medication error, for example that inappropriate advice on the type of vaccinations or malaria prophylaxis required, especially if a patient has had to cancel a trip as a result of advice given and has suffered a financial loss. Fortunately, it appears that the number of claims in relation to the number of travelers seen remains small, which probably reflects the self-selected group of travelers who travel and see the travel health advisor. In the unlikely event that travel health advisors encounter a complaint or claim, they should seek advice as early as possible from their insurer. All incidents in the clinic, whether or not they cause a problem, should be reviewed and corrective action taken. To this end it is essential that full and explanatory notes be written up on all travelers seeking travel health advice from travel health clinics.

SUMMARY

Indemnity coverage and personal practice insurance policies are an essential part of travel medicine practice. They provide an important safety net for the practitioner and for the travelers to whom advice is
provided. It is important to realize that, in cases of adverse events, errors, misadventures or even malpractice, travel health advisors will be judged according to the standards set in terms of current policies, guidelines and protocols, as well as by professional standards of practice set by national and international professional groups. Travel health professionals should ensure that they have appropriate training and experience and ongoing continuing professional development.

### 3.2.8 REFERENCES


Table 1. Key international guidelines and examples of national resources used in travel medicine practice

<table>
<thead>
<tr>
<th><strong>Title of Publication</strong></th>
<th><strong>Website (URLs last accessed 16 November 2008)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>WHO International Travel and Health</td>
<td><a href="http://www.who.int/ith">http://www.who.int/ith</a></td>
</tr>
<tr>
<td>NaTHNaC</td>
<td><a href="http://www.nathnac.org">http://www.nathnac.org</a></td>
</tr>
</tbody>
</table>
7. CONCLUSION AND TEN TOP TIPS
Marc Shaw Associate Professor and Medical Director, WORLDWISE Travelers Health Centres, NZ

With around a billion travelers crossing international borders a year, good pre-travel health advice, travel-risk assessment and health education can provide intending globe-trotters with useful information to prevent illness whilst away. There is an increasing trend towards business trips, exotic holidays abroad, and remote-adventure travel destinations.

Travel health professionals and their staff face complex questioning from intending travelers concerning travel for themselves and their families. It is thus essential that the provision of information, advice and management be clear, up-to-date and well communicated to recipients.

Travel health clinics are extremely rewarding to work in, for travelers are usually well motivated towards their personal travel issues. This is a ‘feel good’ specialty that supports positive health with preventative measures for i) maintaining self-control over health issues whilst travelling and ii) enabling personal choice on the information required to travel safely, globally.

TOP TEN TIPS
1. Construct and set out the clinic’s aims and objectives
2. Develop and maintain clinic protocols for all aspects of the clinic’s management
3. Plan to cater for pre- and post-travel assessments and examination, travelers with special concerns (e.g. the pregnant traveler, children and travel, travelers with medical conditions, the altitude traveler, the adventure traveler, and the like)
4. Take care of vaccine storage and ‘cold chain’
5. Regularly update all staff in ‘dealing with emergencies’ in the clinic
6. Plan a ‘one stop shop’ that has travel health-related product to complement available services at the clinic
7. Develop essential resources and information sources for the clinic
8. Develop patients advice publications
9. Develop good communication links with the pharmaceutical companies providing the vaccines and other clinic products
10. Develop clinic auditing tools, to assess performance
Advanced Topics
1. ADDING RETAIL SALES TO CLINICAL CONSULTATION

Alan Spira, Medical Director, The Travel Medicine Center, Beverly Hills, California, USA

While education and immunization are essential pillars to properly practicing Travel Medicine, retail sales are an additional optional service. By providing retail products, a travel medicine practice can add extra depth to the service provided to the traveler. The types of products which may be sold vary greatly, and may range from purely health-related travel items to exotic or hard-to-find travel gear.

The commonest products sold may include insect repellents, sunscreen, water purification systems, first aid kits, clothing, and electronics. Nevertheless, there are pros and cons which should be carefully considered before embarking upon retail sales.

There are benefits to both the travel health clinic (the provider) and the traveler. For the provider, the sale of product adds an extra layer of service and improves the practice’s image, as well as providing necessary additional revenue. For the traveler, such retail sales reinforces the fact that the travel medicine practice being visited is comprehensive and attuned to the needs of travelers. Furthermore, a traveler who is pressed for time, saves time by purchasing some basic necessities right at the time of their office visit, an efficient use of time and an example of ‘the one stop shop’ concept.

There are several negative aspects to providing retail sales, which should be objectively and carefully thought of before embarking upon this course. First, there is cost. The costs involved with retail include that of:

**An inventory:** Inventory are the actual products, which require purchasing and keeping a minimal supply in order to serve customers needs. The inventory needs constant attention and tracking, with order minimums being required by most wholesalers and manufacturers. Furthermore, one has to create a retail credit record in order to establish purchase accounts with such distributors.

**Adequate Space:** With offices and clinics already strapped for space, one needs to consider the additional space needed for both displaying products for sale and for storing additional products. How products are displayed and how much product is displayed has a great impact upon sales; there is a whole field of study dedicated to retail space and displaying sales items. Underlying this will naturally be additional lease costs for the additional space, which can vary greatly. In large urban environments, where travel medicine practices have the best chance to thrive because of the population density and availability, one naturally finds the highest rents.

**Additional Staff:** Consider the additional staff who would be hired for the retails sales and the associated costs such as taxes, health insurance and other factors involved with additional staff. If clinics plan to utilize current staff, they need to consider whether they can take on the additional role of salesperson, and are they willing to do so? If not, then the products will not leave the shelves. If they are willing, will this take them away from other important duties, such as patient care, charting, billing or insurance work?

**Unique Services based upon clinic type.** With different practice types and different clientele, there are opportunities for variety in travel medicine practices. These can include non-profit opportunities, for-profit opportunities, academic & research, public health or international potentials and prospects.
2. SERVICES OFFERED FOR TRAVELERS - TRAVEL HEALTH RELATED PRODUCTS

Larry Goodyer, Professor of Pharmacy Practice and Head of the Leicester School of Pharmacy, De Montfort University, and Director, Nomad Medical, LONDON

Paul Goodyer Director and CEO, Nomad Medical, LONDON
(Declared Interest: Larry and Paul Goodyer are Directors of Nomad Medical Supplies, in the UK)

The key elements for risk management of travel health related problems lies in a combination of adequate prophylaxis and an understanding by the traveler of how to avoid, or cope with, these problems if they arise. One important step that can be taken by the traveler is to obtain a range of health related supplies and in particular have knowledge of their importance and how they are best used. The travel clinic is therefore the ideal environment in which to not only purchase the relevant supplies and equipment but also have at hand the potential advice of those who have sufficient background knowledge to aid in their selection.

This section examines the very wide range of equipment that the traveler may need. It is true that many of these same items of equipment can be purchased through camping shops, drug stores, the Internet or other retail outlets. However, the clinic can provide a “one stop shop” for these items and be able to tailor what is required to the traveler’s itinerary and particular health needs. Also, as is explained below, the supply process can be integrated seamlessly with the travel clinic to reinforce the advice offered during a formal consultation.

In this section a very liberal view has been taken of what might be considered health related equipment. This is because anything contributing to the health and well being of the traveler is important in risk management. For instance it is well recognized that ill-fitting footwear or a poorly designed rucksack can result in important health issues. Similarly inappropriate clothing in extremes of environment can also have serious consequences. This section will therefore give an overview of how the clinic can provide the equipment to the traveler in the most practical way.

Organization of the Clinic to provide Health Related Equipment

The way in which items are supplied and selected for the traveler may vary greatly depending on the clinic’s setting. If a single handed operation, employing no other staff the health professional may need to be in a position to directly supply the equipment to the traveler. This will inevitably cut into consultation time if the clinic is busy so it is sensible in this case to only stock a relatively small range of supplies closely linked to the consultation, for example bite avoidance medicines and first aid.

Most travel clinics though do have unqualified staff in the form of receptionists or assistants. These can be fully utilized therefore in the process of supplying equipment. To maximize their potential it is also desirable that such staff should be trained to give the necessary advice. For instance, during the consultation in many cases bite avoidance will be discussed. In this time the Travel Health Professional (THP) would simply indicate that they should obtain repellents and a mosquito net. Time could then be saved by simply passing the traveler to a receptionist for further advice and supply. However this does have implications for adequate staff training and monitoring but the investment will pay off in terms of efficiency. Furthermore such staff can be trained to reinforce the advice that THPs are giving in the clinic.

The process is best illustrated by our own organization in the UK. We run a number of stores that are located on busy high streets in major cities. Each store has a one or two bay clinic staffed by nurses as well substantial retail sales areas. One member of the retail staff is designated and trained as a clinic receptionist to book in travelers and receive them when they visit the store. After the consultation the nurse is encouraged to pass over the traveler to the retail staff and brief them concerning their particular requirements for equipment and further information, although the staff has also been trained to identify further issues concerning appropriate equipment. In the larger stores the traveler may be passed
between various members of staff dealing with the different types of equipment. Medicines are almost exclusively supplied by the nurse, the exception being kits containing medicines which can be supplied through a retail outlet without legal restriction. Similarly most first aid kits are sold directly over the counter. Uniquely one of our larger stores does have a registered pharmacy which will supply tailored medical kits mostly for specialized groups and expeditions, although it is open to the public at certain times for consultation with the pharmacist. The organization is backed up by warehousing and pharmaceutical wholesaling which makes possible the outfitting of very large groups of travelers and expeditions, but this is beyond the scope of the service offered by many travel clinics.

A key decision to be made is the range of products that will be sold through the clinic. It is unlikely that most clinics will wish or be able to supply the entire range of products described in this chapter. Most clinics would therefore stock items that are only directly related to the advice being given through the clinic and these would include medical kits, first aid kits, bite avoidance products, sun blocks, water purification, travel soaps and hand washes. Many of the miscellaneous products that will be described later can be purchased quite easily in other types of retail outlets, so should only be considered if there is sufficient display area. In any case it is advisable to have a stand clearly displaying the various items for sale. Clinic manager and THPs need to bear in mind that if they are directly supplying medicines, rather than issuing a prescription, the traveler will not have the opportunity to have advice reinforced by a pharmacist and so ensure they clearly understand the use of any medicines purchased.

There is often a temptation for travelers to purchase items at destination. The dangers of doing so for medicines are well recognized but this principal can also apply to other products. For instance DEET is the first line recommendation as a repellent in malaria endemic areas, but it may not be available at many destinations.

For a small clinic it is easier to purchase most of the equipment from one wholesaler. In Table 1 are the contact details of some well known such supplies worldwide.

**Table 1. Useful websites for supply:**

<table>
<thead>
<tr>
<th>Company</th>
<th>Website</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nomad - UK</td>
<td><a href="http://www.Nomadtravel.co.uk">www.Nomadtravel.co.uk</a></td>
<td>Travel Clinics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Registered Pharmacy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pharmacy wholesaler</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Travel health accessories</td>
</tr>
<tr>
<td></td>
<td></td>
<td>General Travel accessories</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medical/ first aid kits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Travel Health accessories</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pharmacy wholesaler</td>
</tr>
<tr>
<td>Pyramid - UK</td>
<td><a href="http://www.Pyramidtravelproducts.co.uk">www.Pyramidtravelproducts.co.uk</a></td>
<td>Travel Health accessories and first aid</td>
</tr>
<tr>
<td>Care Plus - Netherlands</td>
<td><a href="http://www.Tropenzorg.nl">www.Tropenzorg.nl</a></td>
<td>Travel Health accessories and first aid</td>
</tr>
<tr>
<td>Lifesystems - UK</td>
<td><a href="http://www.Lifesystems.co.uk">www.Lifesystems.co.uk</a></td>
<td>Travel Health accessories and first aid</td>
</tr>
<tr>
<td>Go products</td>
<td><a href="http://www.design-go.com">www.design-go.com</a></td>
<td>Wide range of general travel accessories</td>
</tr>
</tbody>
</table>
Products for Protection against the Environment (Table 2)

Travelers will undoubtedly encountering living and environmental conditions that are different from their place of residence. This will not only be in terms of climatic conditions but also in residential accommodation. Appropriate equipment and preparation can undoubtedly help to make for a more comfortable trip and also protect against potential health hazards. The range of products is summarized in Panel 2 and will be discussed briefly below. There are a number of categories of products which are generally not suitable for sale in clinics unless associated with a larger retail area, but they are included here for completeness.

Healthy and comfortable sleeping conditions contribute much to the mental well being of the traveler. Most clinics would not necessarily wish to stock sleeping bags and mattresses and it should also be indicated to the traveler that these are comparatively bulky items, unlikely to be needed unless camping. Sleeping bags come in a range of insulation types to suit different environments and modern “stuff bags” allow for quite compact storage. The self-inflating mattress, which uses a combination of air and foam, the air being drawn into expand the foam as the mat is unrolled, is also a useful camping items. Even the most basic accommodation will provide bed coverings and one of the most useful items for backpackers to carry are “sleeping bag liners” which are simple cotton sheets in the shape of a sleeping bag. These can be washed and laundered by the traveler and their use in theory could minimize contact with bed bugs, particularly if treated with insecticide. Also the somewhat more expensive silk liners could be stocked and when folded such liners are very small and light to carry. It may be worth stocking the small metallic survival blanket for those undertaking more adventurous outdoor activities.

It is unlikely that a travel clinic would be able to justify stocking clothing and footwear but some with a relatively niche market may wish to select certain items. For instance if specializing in the high end tropical travel for a relatively affluent traveler certain items of appropriate clothing such as hats, shirts and trousers might be considered. A few general health-related points should be made. Wide brimmed hats are particularly important for sun protection and long sleeved trousers and shirts are recommended as part of bite avoidance measures. The modern materials for tropical clothing are well suited for hot conditions, allowing for wicking away of sweat from the body. However, this effect is negated in the very humid conditions of the rainforest and it is also not worthwhile in these situations wearing much waterproof clothing. Sleeping in wet clothing may well encourage fungal infections and is uncomfortable, so it is always recommended to keep dry clothing separate in the rucksack to wear at night, and waterproof rucksack liners may be provided for this purpose. If the traveler is encountering many different environments then the layering approach to clothing is useful whereby a number of relatively thin items of clothing are worn, rather than carrying specifically heavier items. Footwear is particularly important for walkers and trekkers and again appropriate fitting is best left to specialist outlets.

There are two complementary items that are particularly useful for trekkers and backpackers. One is the waterproof poncho which can cover clothing and backpack and can even be improvised as a temporary shelter. The other is the poncho liner sometimes referred to as a tropical quilt, useful as insulation against the cold and as a blanket to lie on in any situation being very lightweight to carry. Tents though would not normally be worth stocking.

Sun protection preparations are included when travelling to most environments and easy to obtain by the traveler so not likely to be purchased in the clinic. It may be worth stocking a limited range of either economy or high end products depending on the traveler and perhaps promoting the chosen range as those recommended by your clinic as being reliable and of a high quality.

Finally, a clinic may have sufficient travelers undertaking more outward bound trips to stock a range of the survival type items as listed in Table 2.

Table 2. Environmental Protection
### Sleeping:
- Sleeping bags*
- Sleeping bag liners
- Mattresses * (Foam* / Self Inflating*
- Emergency Blankets

### Clothing and Footwear:
- Hats – styles for sun protection*
- Light shirts and vests*
- Socks for walking – insecticide treated
- Trousers – rip stop, tropical*
- Jungle and other walking boots *

### Shelter:
- Tents*

### Sun Protection:
- UV factor 15-40 SPF + UVA protection
- After Sun
- Sun glasses

### Survival Equipment:
- Emergency rations *
- Chemical Lights *
- Waterproof Matches *

---

**Food and Water (Table 3)**

To aid the advice regarding safe food and water a range of products can also be usefully provided through the clinic. One obvious area is the preparation of safe water and a range of chemicals and filters should be stocked. In terms of food preparation and utensils, these can be purchased through camping stores but a select range of such items could be considered.

Iodine based preparations provide a reliable and cheap source of chemical for water purification. There are claimed advantages of efficacy over chlorine but the Iodine may be contraindicated in certain individuals e.g. those with Thyroid conditions. Tincture of iodine is probably the cheapest to use but can be messy, tablets are convenient but can take a while to dissolve. Chlorine based tablets are also very cost effective and easily obtained. Perhaps the most effective of chemical treatments are the Chlorine Dioxide products, claimed to also even deal with more resistant organisms such as Cryptosporidium and other parasites. Most available Chlorine Dioxide products comprise a two stage system of solution and activator and it does tend to be expensive and fiddly to prepare. Chlorine Dioxide also has the advantage of not imparting any taste into the water. Similarly Katadyn Silver preparations also will not impart taste to the water but tend to have a narrow spectrum of activity compared to other chemicals.

A small range of reliable purifiers should also be stocked. Iodine resin based ones are the most common, although they are somewhat expensive. Choose one type that can easily be carried around and another larger one if dealing with outward bound groups. A recent effective device is the small UV portable sterilizer that runs on small batteries.

If surface water is taken from lakes or streams this does require removal of organic matter before chemical treatment. Canvass Millbanks bags are particularly useful for pre-filtering water if large amounts will need to be treated.

If those trekking in hot climates will need access to quite large amounts of water for drinking. The ideal light containers are bladders that come in a range of sizes and otherwise a range of rigid water bottles may be stocked. Hoser bottles are bladders stored in the back pack with a tube so that a regular intake of water is achieved whilst on the move. Although there is little evidence to support the view that forms of travelers’ diarrhea are transmitted by contaminated utensils, it would seem reasonable to recommend using personal utensils when in certain situations e.g. purchasing food and drink from a street vendor. A small metal mug is particularly useful and a lightweight set of utensils and a mess tin can also be considered.
A means of heating water is also sometimes desirable but gas and flammable materials cannot be carried on an airline. Small portable kettles are probably the most practical options.

For those dealing with trekking or outward bound groups there are ranges of prepared survival foods that could be stocked but are probably best left to specialist outlets in most circumstances.

<table>
<thead>
<tr>
<th>Table 3. Food and Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Purification:</td>
</tr>
<tr>
<td>i) Chemical Iodine</td>
</tr>
<tr>
<td>Chlorine</td>
</tr>
<tr>
<td>Chlorine Dioxide e.g. Biox</td>
</tr>
<tr>
<td>Ketadyne</td>
</tr>
<tr>
<td>ii) Purifiers/ Filters :</td>
</tr>
<tr>
<td>Pocket sized e.g. Aqua Pure Traveler</td>
</tr>
<tr>
<td>Medium sized e.g. Premac Trekker Well Purifier</td>
</tr>
<tr>
<td>Compact e.g. UV SteriPen</td>
</tr>
<tr>
<td>iii) Water Containers:</td>
</tr>
<tr>
<td>Bladder</td>
</tr>
<tr>
<td>Rigid e.g. Sigg Water Bottle</td>
</tr>
<tr>
<td>Utensil and Food Preparation: *</td>
</tr>
<tr>
<td>Personal mug</td>
</tr>
<tr>
<td>Knife/ fork/ spoon set</td>
</tr>
<tr>
<td>Mess tin</td>
</tr>
<tr>
<td>Cookers</td>
</tr>
<tr>
<td>Heat Element</td>
</tr>
<tr>
<td>Solid Fuel (Fuel safe on plane?)</td>
</tr>
</tbody>
</table>

Survival Foods *

**Personal Hygiene (Table 4)**

An element of healthy travel is paying attention to the normal standards of personal hygiene, which can be difficult in certain environments away from home. A range of products could potentially be supplied to the traveler to aid them in a variety of situations.

The most important recognized personal hygiene measure is good hand washing and this can be hard to achieve when adequate facilities are difficult to find. There are now widely available “no water washes” and hand scrubs that can be carried in a bag or pocket. Otherwise the ubiquitous packets of hand wipes are always useful, particularly when travelling with young children.

Concentrated soap solutions can make life easier for the backpacker. Some products are multi-purpose and can be used to wash skin, hair and clothes. A few of these even incorporate conditioners. Otherwise there are many personal hygiene type items in convenient sizes and packaging for travelers that can be purchased from supermarkets or drug stores for instance shaving equipment and oral hygiene. Also for backpackers there are now a range of small, lightweight and high-absorbency travel towels which are readily available and could be considered for stocking in the clinic.

Similarly women will wish to be prepared with a supply of sanitary towels and it is unlikely that the clinic would wish to stock such items. There are useful products when carrying large supplies of sanitary towels or when wearing such products might not be desirable called ‘Moon Cups’ which as the name suggests is a small insertable, reusable and washable cup made of medical grade silicone. Another product that can be considered by women who are unlikely to have easy access to lavatories is the ‘Shewee’ which can be used to allow urination whilst standing. Finally all clinics should stock a range of condoms to back up the advice on safe sex.
Table 4. Hygiene

<table>
<thead>
<tr>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>All purpose Soap (and clothes)</td>
</tr>
<tr>
<td>Travel Hand Scrub</td>
</tr>
<tr>
<td>Tooth Hygiene</td>
</tr>
<tr>
<td>Hand Wipes</td>
</tr>
<tr>
<td>Travel Clothes Wash</td>
</tr>
<tr>
<td>Condoms</td>
</tr>
<tr>
<td>Women Sanitary</td>
</tr>
<tr>
<td>Travel Towels</td>
</tr>
</tbody>
</table>

Getting Around (Table 5)

One range of items very unlikely to be sold through clinics is any form of luggage, rucksack etc. These are simply too bulky to stock in most environments although the correct selection can be very important to prevent strains or other injuries. An ill-fitting rucksack for instance may result in musculoskeletal problems or sores. It would be useful for the clinic to be able to recommend a reliable and knowledgeable supplier.

There are a few related smaller items that might be considered for sale to clinic travelers such as the dry liners that are sold for inserting into rucksacks and holdalls mentioned earlier. Similarly a variety of waterproof zip bags can be used to good effect, in particular for storage of medicines.

Security issues are important in many destinations and a range of padlocks and money belts might also be stocked. These are quite small items and so can be displayed on a discreet carousel. In fact many of the items for travel can be purchased from one source such as the Go products. It is true that they are also available at airports and other outlets, but travelers will also purchase such items at the clinic visits which act as a prompt for general preparations for their trip. The use of flight-stocking is a well recognized strategy to prevent DVT on long haul flights. There is an argument that those which have been properly fitted are more effective than the widely available off the shelf below knee socks. The clinic should perhaps therefore focus on offering a product that requires measurement of ankle and calf such as those from Mediven (www.mediuk.co.uk), as have been used in studies on DVT prevention in air travel.

Communication gear and Sat Nav equipment are also best sold by specialist stores for those travelers to remote locations. It is worth remembering though that for such travelers a good rescue service incorporated into any insurance cover is vital. The clinic should have to hand a list of suitable companies to which the traveler can be referred.

Table 5. Getting Around

<table>
<thead>
<tr>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rucksack and Holdalls*</td>
</tr>
<tr>
<td>Dry Liner Bags</td>
</tr>
<tr>
<td>Waterproof Zip Bags</td>
</tr>
<tr>
<td>Security:</td>
</tr>
<tr>
<td>Pad Locks</td>
</tr>
<tr>
<td>Money Belts</td>
</tr>
<tr>
<td>Various:</td>
</tr>
<tr>
<td>Flight Pillows</td>
</tr>
<tr>
<td>Fans</td>
</tr>
<tr>
<td>Travel Games*</td>
</tr>
<tr>
<td>Flight Socks</td>
</tr>
<tr>
<td>Electrical Adaptors</td>
</tr>
<tr>
<td>Lighting *</td>
</tr>
<tr>
<td>Communications and Sat Nav *</td>
</tr>
</tbody>
</table>
**Bite Avoidance Measures (Table 6)**

This is certainly an area which should be well covered by supply through the clinic. Their sale can be used to reinforce the advice given during the consultation regarding insect borne diseases.

Of the repellents applied to the skin, DEET is recommended as a first choice for those visiting areas where insect borne diseases are endemic. In general products of greater than 30% concentration of DEET should be stocked. A variety of presentations are available including spray, creams and roll-ons and lotions. Of these it is likely that a lotion will encourage a more optimal coverage of the skin and dose application, although there is little evidence for this. The important principle is that the product should encourage optimal usage and for those who are not happy to use DEET for cosmetic or other reasons alternatives should be offered. Products that contain lemon eucalyptus in reasonable concentrations are a good alternative. A further effective repellent is Picaridin now available in many parts of the world.

Mosquito nets are often an essential item for bite avoidance and a range of these ready impregnated with insecticide should be available. Again it is compliance and ease of use that are essential for their effectiveness so a range of sizes and types should be made available for sale. There are some self-supporting and self-erecting type nets that are available for campers but most people will need a relatively portable lightweight net that is easy to hang in any overnight accommodation. To this end a small multi-purpose hanging kit can also be purchased. The new Long lasting impregnated nets (LLINs) are available that need not be retreated during the physical lifetime of the net which can be from 3-5 years. Some manufacturers do claim LLIN status but are not WHO approved and the residue activity may well reduce significantly after a year or two. The cost effective alternative is to supply re-treatment insecticide kits that can be used by the traveler after each trip away.

For personal protection insecticide sprays for treating clothing also have their place. There is some evidence that insecticide treated clothing when used in combination with a skin repellent provides some additional protection from mosquitoes. Treated clothing used in the absence of a skin applied repellent probably has little efficacy against mosquitoes. One area where clothing treatment has a distinct advantage is against ticks, where impregnated socks or trousers can provide protection for many weeks.

The other important advice is to clear the room of mosquitoes before retiring and there are a number of products that can be carried to achieve this end. A small knock-down spray can be used in any environment and if an electrical supply is available a plug-in vaporizer can be used. Otherwise insecticide coils for burning can be used when out of doors.

**Table 6. Bite Avoidance**

<table>
<thead>
<tr>
<th>Skin Applied Repellent</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Deet</td>
<td>Lemon Eucalyptus</td>
<td>Picaridin</td>
<td></td>
</tr>
<tr>
<td>Nets</td>
<td>Ready impregnated</td>
<td>Re-treatment kit</td>
<td>Long Lasting Impregnated Nets</td>
</tr>
<tr>
<td>Knock down spray</td>
<td>Insecticide clothing treatment</td>
<td>Insecticide vaporiser</td>
<td></td>
</tr>
</tbody>
</table>

**3.5.8 Medical Kits and Medications (Table 7)**
The general issues of medical supplies held by the clinic are dealt with in other sections of this monograph. In this section there is presented an overview of the range of such items that could reasonably be supplied directly to travelers.

It is important to consider what may be legally sold or supplied by clinic health professionals in the particularly country. For instance in the UK a system of protocols known as Patient Group Directions allows nurses, pharmacists and other health professionals to supply prescription medicines. This may not be applicable in other countries. Concerns are often expressed over carrying medicines across international borders. As problems most often arise from travelers’ prescribed narcotic or psychotropic medication, these are best not stocked and that would include analgesics with even low doses of codeine.

A decision needs to be made as to what items will be supplied by the clinic and what might be supplied through an outside pharmacy on recommendation or prescription. It is worthwhile compiling a medication first aid checklist for travelers that could be completed in the clinic and some of the items then supplied directly. Such checklists are best adapted to the clinic’s particular profile and practices, for instance more extensive lists might be needed if dealing with larger groups or expeditions.

The medicines described in Table 6 can be issued individually or in kit form. For instance a diarrhea treatment kit could include loperamide, ciprofloxacin and oral rehydration sachets. It is probably not worth stocking individual over-the-counter medicines such as creams, antihistamines and analgesics but these could be sold as part of a ready-made kit. Some broad spectrum antibiotics could also be stocked and supplied and might include amoxicillin/ clavulanic Acid, clarithromycin and trimethoprim. Other specific medications apart from anti-malarials might include acetazolamide for mountain sickness.

First aid kits may be supplied with or without medicines. One or two types may be worth stocking including a basic one comprising of simple dressings and antiseptic, through to others which are more extensive and incorporate more specialist dressings. The range of such dressings and items might include steri-strips, Hydrocolloid dressings and burn dressings. The sterile kit comprising of syringes, needles, cannulae etc are sometimes useful for longer term travel where health facilities are poor. Make sure the packaging clearly indicates their purpose to guard against problems at border crossings. These and other first aid packs should always be stored in the hold of the aircraft these days for security reasons.

There are a variety of other items that can be stocked or ordered where necessary, for instance Insulin cool bags are now available and work using a chemical that can be reactivated when needed.

### Table 7. Medication

<table>
<thead>
<tr>
<th>Malaria prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medications dispensed from travel health clinic</td>
</tr>
<tr>
<td>Stand by Malaria treatment packs</td>
</tr>
<tr>
<td>Anti-diarrhoeal medication</td>
</tr>
<tr>
<td>Antibiotics for self treatment</td>
</tr>
<tr>
<td>Over-the-counter medications and creams as kit</td>
</tr>
<tr>
<td>Mountain sickness</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>First Aid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic kit for minor injury</td>
</tr>
<tr>
<td>Comprehensive first aid kit</td>
</tr>
<tr>
<td>Sterile kits</td>
</tr>
<tr>
<td>Dental repair</td>
</tr>
<tr>
<td>Miscellaneous</td>
</tr>
<tr>
<td>Cool bags for Insulin</td>
</tr>
<tr>
<td>Digital thermometers</td>
</tr>
</tbody>
</table>
3. TRAVEL HEALTH VACCINATIONS

Annelies Wilder-Smith, Director, Travelers’ Screening and Vaccination Clinic, National University Hospital of Singapore, and Associate Professor, National University of Singapore

Vaccination

Immunizations prior to travel contribute to reducing the risk of specific diseases for the individual traveler as well as the risk of international spread of diseases. Recommendation for travel vaccines should be evidence based, and are influenced by the epidemiology in the destination country/countries, host factors, duration of travel, activities during travel, legal requirements and often just simply also the budget of the traveler. Immunizations for international travel can be categorized as: (1) routine childhood and adult immunizations, (2) required - those needed to cross international borders as required by international health regulations, and (3) recommended according to risk of illness at the travel destination.

Routine Immunizations: Travel can be an excellent opportunity to update routine immunizations, such as childhood immunizations or those routinely advised to certain high risk adult populations.

Routine childhood immunizations recommended in national vaccination programs usually include those against diphtheria, tetanus, pertussis, poliomyelitis, measles, rubella, mumps, Haemophilus influenzae B, and in most industrialized countries also against chickenpox, pneumococcal and meningococcal disease. If travelers do not have a history of adequate protection against these diseases, immunizations appropriate to their age and previous immunization status should be obtained, whether or not international travel is planned. In the following, the focus will be on selected routine immunizations for adolescent and adult travelers. For pediatric travelers, refer to national guidelines.

Diphtheria/tetanus/pertussis: A large epidemic of diphtheria occurred in the former Soviet Union from 1990 to 1997, and travelers were also affected. Diphtheria vaccine is usually combined with the tetanus vaccine. Recently, two tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccines (Tdap) were licensed for use in adolescents and adults. Anyone whose history of primary tetanus and diphtheria vaccination is uncertain should be considered unvaccinated and should receive the three-dose series. Anyone who has received only one or two prior doses of tetanus and diphtheria toxoids should receive additional dose(s) to complete the three-dose series. A single dose of Tdap can be substitutes for any of the Td doses. If a primary childhood vaccination series against diphtheria, tetanus and pertussis was completed, adolescents and adults 11-65 of age should receive a single dose of Tdap.

Poliomyelitis: Significant progress has been made towards global eradication of poliomyelitis. More than 125 countries were endemic for polio in 1988; as of 2007, there are only four endemic countries where wild poliovirus transmission has never been interrupted: Afghanistan, India, Nigeria and Pakistan. Wild poliovirus importations from the four endemic countries into previously polio-free countries continue to occur, with some resulting in new outbreaks. As of mid-2007, imported wild poliovirus was circulating in five previously polio-free countries: Angola, Chad, Democratic Republic of the Congo, Myanmar and Niger. Travelers to polio-infected countries who have received three or more doses of OPV in the past should be offered another dose of polio vaccine before departure. Any unimmunized individuals intending to travel to such areas require a complete course of vaccine. Countries differ in recommending IPV or OPV in these circumstances: the advantage of IPV is that any risk of VAPP is avoided, and IPV has replaced OPV in all industrialized countries. Dosing: Adults who are traveling to areas where polio still occurs and who are unvaccinated or incompletely vaccinated should receive three doses; the first two doses should be administered at intervals of 4-8 weeks; a third dose should be administered 6-12 months after the second. For adult travelers who have completed their primary series, a single booster is recommended with IPV. For newborns or unvaccinated children < 2 years of age travelling to areas with high polio risk should consider following a more accelerated schedule compared to the normal childhood immunization schedule.
Hepatitis B: Because routine administration of hepatitis B vaccine to infants and/or adolescents was not initiated until the 1990s in most industrialized countries, many adults remain unvaccinated. The monthly incidence for travelers is approximately 25 per 100,000 for symptomatic infections and up to 420 per 100,000 for both symptomatic and asymptomatic infections. The risk depends on (1) the prevalence of HBV infection in the country of destination, (2) the extent of direct contact with blood or body fluids or of sexual contact with potentially infected persons, and (3) the duration and type of travel. Principal risky activities include health care (medical, dental, laboratory or other) that entails direct exposure to human blood or body fluids; receipt of a transfusion of blood that has not been tested for HBV; and dental, medical or other exposure to needles (e.g. acupuncture, piercing, tattooing or injecting drug use) that have not been appropriately sterilized. In addition, in less developed countries, transmission from HBV-positive to HBV-susceptible individuals may occur through direct contact between open skin lesions following a penetrating bite or scratch.

The vaccine should be considered for virtually all non-immune individuals travelling to areas with moderate to high risk of infection. It can be administered to infants from birth. The standard schedule of administration is three doses, given as follows: day 0; 1 month; 6–12 months. A rapid schedule of administration of monovalent hepatitis B vaccine is given on days 0, 7, 21 days and is also approved for the schedule of 0; 1 month; 2 months. An additional fourth dose is required for the accelerated schedule to ensure long duration of protection and is given 6-12 months after the first dose.

Required Vaccines

Yellow fever: Vaccination against yellow fever has been required for several decades by many countries with receptive mosquito vectors to prevent the importation of this disease virus from a country that had ongoing transmission. Importation of the virus by an infected traveler could potentially lead to the establishment of infection in mosquitoes and primates, with a consequent risk of infection for the local population. Countries declaring such a requirement continue to include those with and without current yellow fever transmission.

The international yellow fever vaccination certificate becomes valid 10 days after vaccination and remains valid for a period of 10 years. If yellow fever vaccination is contraindicated for medical reasons, a medical certificate is required for exemption, and the traveler needs to take additional precautionary measures to avoid mosquito bites. Travelers who do not have the required yellow fever vaccination or appropriate documentation of a vaccination waiver upon entering a country might be subject to vaccination, medical follow-up, isolation, or quarantine, or a combination of these. In a few countries, unvaccinated travelers are denied entry.

Yellow fever vaccine produced by different manufacturers worldwide must be approved by WHO and administered at an approved yellow fever vaccination center. In the US, these can be identified on www2.ncid.cdc.gov/travel/yellowfever.

Travelers should be aware that the absence of a requirement for vaccination does not imply that there is no risk of exposure to yellow fever in the country. For information on countries that require proof of yellow fever vaccination as a condition of entry, as well as countries that have ongoing risk of yellow fever transmission, see country list at www.gov.int/ith.

Meningococcal disease: Vaccination against meningococcal disease (serogroups A, C, Y, W135) is required by Saudi Arabia for pilgrims visiting Mecca for the Hajj or for the Umrah. This is a visa entry requirement.

Poliomyelitis: Saudi Arabia requires travelers/pilgrims from polio endemic countries to be immunized against polio in order to obtain an entry visa. Updates are published in the Weekly Epidemiological Record at www.who.who.

Cholera: Currently, no country requires vaccination against cholera as a condition for entry. Local authorities, however, may continue to require documentation of this vaccination. In such cases, a single
dose of either oral vaccine is sufficient to satisfy local requirements, or the travelers may request a medical waiver from a physician.

Note: At this time, the yellow fever vaccination remains the only disease for which an international vaccine certificate can be used.

**Recommended travel vaccines:** The decision to recommend a vaccine depends on an individualized travel risk assessment. In the following, recommended travel vaccines will be presented in alphabetical order.

**Cholera.** Travelers who follow the usual tourist itineraries with standard accommodations are at virtually no risk of infection. It is therefore only recommended for individuals at increased risk of exposure, particularly emergency relief and health workers in refugee situations, or during cholera outbreaks. The recombinant B subunit cholera vaccine (Dukoral) that offers moderate cross-protection against enterotoxigenic *Escherichia coli* (ETEC) can be offered to travelers with a known predisposition to traveler’s diarrhea or at high exposure to contaminated food and water during their travels. However, the recombinant B subunit cholera vaccine as a vaccine against travelers’ diarrhea remains controversial and different opinions exist among travel medicine providers from different countries.

*Vaccine:* Oral cholera vaccines include the CVD 103-HgR and the whole cell, and the recombinant B-subunit cholera vaccine. The first is a live attenuated vaccine which requires a single dose; however, this vaccine is no longer available. The recombinant B subunit cholera vaccine is available in some but not all countries (it is not available in the US); it is an inactivated vaccine and requires two oral doses administered with a 1- to 6 week interval. Recipients should not eat or drink a few hours after ingesting the vaccine. Efficacy is 85% against cholera 01-serogroup. Duration of protection is 78% after 1 year, 60% after 2 years. There is also some limited efficacy (52-60%) against enterotoxigenic *Escherichia coli* (ETEC).

**Hepatitis A (Table 1):** Hepatitis A, with the exception of influenza, is the most frequent vaccine-preventable infection in non-immune individuals traveling to developing countries. The average incidence rate is about 3 per 1,000 travelers per month; in high-risk backpackers or foreign-aid volunteers, the rate may be as high as 20 per 1,000 travelers per month.

*Vaccine:* The inactivated hepatitis A vaccine is safe and highly effective. Anti-HAV antibodies are detectable by 2 weeks after administration of the first dose of vaccine. The second dose – given at least 6 months, and usually 6-24 months, after the first dose – is necessary to promote long-term protection. Results from mathematical models indicate that, after completion of the primary series, anti-HAV antibodies probably persist for 25 years or more. Booster doses are not recommended. Serological testing to assess antibody levels after vaccination is not indicated. If a traveler forgets to take the second dose, it is not necessary to restart the primary dose. Given the long incubation period of hepatitis A (average 2–4 weeks), the vaccine can be administered up to the day of departure and still protect travelers. The use of immune globulin is now virtually obsolete for the purposes of travel prophylaxis.

A combination hepatitis A/typhoid vaccine is available for those exposed to waterborne diseases. The vaccine is administered as a single dose and confers high levels of protection against both diseases. A second dose of hepatitis A vaccine is needed 6–24 months later and boosters of typhoid vaccine should be given at 3-yearly intervals.

A combination vaccine that provides protection against both hepatitis A and hepatitis B may be considered for travelers who may be exposed to both organisms. Primary immunization with the combined hepatitis A and B vaccine consists of three doses, given on a schedule of 0, 1 and 6 months. According to the manufacturer’s instructions, this combination vaccine may also be administered on days 0, 7 and 21, with a booster dose at 12 months. Minor local and systemic reactions are fairly common. Minimum age is 1 year.
Table 1: Hepatitis A vaccine:

<table>
<thead>
<tr>
<th>Type of vaccine:</th>
<th>Inactivated, given Intramuscular IM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of doses:</td>
<td>Two</td>
</tr>
<tr>
<td>Schedule:</td>
<td>Second dose 6–24 months after the first</td>
</tr>
<tr>
<td>Booster:</td>
<td>Not necessary</td>
</tr>
<tr>
<td>Contraindications:</td>
<td>Hypersensitivity to previous dose</td>
</tr>
<tr>
<td>Adverse reactions:</td>
<td>Mild local reaction of short duration, mild systemic reaction</td>
</tr>
<tr>
<td>Before departure:</td>
<td>Protection 2–4 weeks after first dose</td>
</tr>
<tr>
<td>Recommended for:</td>
<td>All non-immune travelers to endemic areas</td>
</tr>
<tr>
<td>Special precautions:</td>
<td>None</td>
</tr>
</tbody>
</table>

HPV Vaccine: For the female traveler between the ages of 11 and 26 years not previously vaccinated. Travel has not been demonstrated to increase HPV risk but as there is some evidence of increased sexual activity when people travel, the pre-travel consultation can be an opportunity to catch up vaccination.

Influenza: Various outbreaks of influenza on cruise ships or after airline flights have been described. The GeoSentinel Surveillance Network with data from more than 17,000 travelers between 1998 and 2004, respiratory illnesses were the second most common illness in returning travelers. In a prospective study amongst travelers to the developing world, the incidence of influenza was 1.4%. Influenza vaccine should always be recommended to the high risk groups as defined by the American Committee of Immunization practices which include age over 50 years (in some countries this is advised from those over 65 years), underlying cardiac or pulmonary morbidity, immunodeficiencies etc. However, based on the documented high incidence of influenza amongst travelers, particularly to the Northern Hemisphere during the influenza peak season, influenza vaccine can be considered independently of whether they belong to the high risk group or not.

Vaccine: The inactivated influenza vaccine contains three strains of influenza viruses, and is administered intramuscularly or subcutaneously. It is usually given once per year, just before the influenza season. It is considered a safe vaccine and can be given during pregnancy. No substantial increase in Guillain-Barre Syndrome has been associated with influenza vaccines except with the ‘swine flu’ vaccine of 1976.

Japanese encephalitis (Table 2): Japanese encephalitis (JE) is the leading cause of viral encephalitis in Asia and occurs in almost all Asian countries. Its incidence has been declining in Japan and the Korean peninsula and in some regions of China, but is increasing in Bangladesh, India, Nepal, Pakistan, northern Thailand and Vietnam. Transmission occurs principally in rural agricultural locations where flooding irrigation is practiced – some of which may be near or within urban centres. Transmission is seasonal and mainly related to the rainy season in south-east Asia. In the temperate regions of China, Japan, the Korean peninsula and eastern parts of the Russian Federation, transmission occurs mainly during the summer and autumn. The incidence in US soldiers was 1-5 per 10,000. Cases of JE in tourist travelers are rarely reported. The risk to short-term travelers and those who travel mainly to urban areas is very low. Vaccination is recommended for travelers with extensive outdoor exposure (camping, hiking, bicycle tours, outdoor occupational activities, in particular in areas where flooding irrigation is practiced) in rural areas of an endemic region during the transmission season. It is also recommended for expatriates living in endemic areas through a transmission season or longer.

Vaccine: There are several vaccines: the inactivated mouse-brain-derived vaccine (IMB) (Biken), cell-culture-derived inactivated vaccine and cell-culture-derived live attenuated SA 14-14-2 vaccine. The Biken vaccine was widely used for travelers, but production has now ceased. The live attenuated SA 14-14-2
vaccine is used only in China and some neighboring countries. A novel inactivated vaccine (Novartis/Intercell) will be licensed soon. In Australia, a new live JE vaccine is in development and appears to be promising.

**Table 2: Japanese Encephalitis**

| Type of vaccine: | Inactivated mouse-brain-derived or live attenuated |
| Schedule: | For the inactivated vaccine: 3 doses at days 0, 7 and 28; or 2 doses given preferably 4 weeks apart (0.5 or 1.0 ml for adults, 0.25 or 0.5 ml for children depending on the vaccines). For the live attenuated SA14-14-2 vaccine equally good protection is achieved with a single dose followed, as required, with a single booster dose given at an interval of about 1 year. |
| Booster: | After 1 year and then 3-yearly (for IMB only) when continued protection is required. |
| Contraindications: | Hypersensitivity to a previous dose of vaccine, pregnancy and immunosuppression (live vaccine). |
| Adverse reactions: | Occasional mild local or systemic reaction; occasional severe reaction with generalized urticaria, hypotension and collapse. |
| Before departure: | Inactivated vaccine, at least two doses before departure. Live attenuated vaccine, one dose is enough. |

*The duration of immunity after serial booster doses in adult travelers has not been well established for the mouse-brain-derived vaccine. For children aged 1–3 years, the mouse-brain-derived vaccine provides adequate protection throughout childhood following two primary doses 4 weeks apart and boosters after 1 year and subsequently at 3-yearly intervals until the age of 10–15 years.*

**Meningococcal disease (Table 3):** Meningococcal disease is usually a sporadic disease, but in the ‘sub-Saharan meningitis belt’ in Africa major outbreaks occur about every 10 years. Travelers to industrialized countries are exposed to the possibility of sporadic cases. Outbreaks of meningococcal C disease occur in schools, colleges, military barracks and other places where large numbers of adolescents and young adults congregate. Travelers to the sub-Saharan meningitis belt may be exposed to outbreaks of serogroup A disease with comparatively very high incidence rates during the dry season (December–June). Long-term travelers living in close contact with the indigenous population may be at greater risk of infection. The tetravalent vaccine, (A, C, Y, W-135) is currently required by Saudi Arabia for pilgrims visiting Mecca for the Hajj (annual pilgrimage) or for the Umrah.

**Vaccine:** The polysaccharide tetravalent vaccine is available in most countries. The new conjugate tetravalent vaccine is superior to the polysaccharide tetravalent in various aspects, but in particular in terms of longer duration of protection, however, it is currently only available in a very limited number of countries. The monovalent meningococcal group C conjugate vaccine is available in most European countries. However, due to the limitation to one serogroup, the current conjugate C vaccine should not be offered to travelers who will be at higher risk of other serogroups and will need additional protection against A and more recently also W135. There is no effective vaccine currently available against serogroup B due to the poor immunogenicity of its capsule.

Table 3 lists the details of the more commonly used polysaccharide tetravalent vaccine.

**Table 3: Meningococcal vaccine:**

| Type of vaccine: | Purified bacterial capsular polysaccharide meningococcal vaccine (tetravalent) |
**Number of doses:** One  
**Protection duration:** 3–5 years  
**Contraindications:** Serious adverse reaction to previous dose  
**Adverse reactions:** Occasional mild local reactions; rarely, fever  
**Before departure:** 2 weeks  
**Consider for:** All travelers to countries in the sub-Saharan meningitis belt and to areas with current epidemics; college students at risk from endemic disease; Hajj and Umrah pilgrims (mandatory)  
**Special precautions:** Children under 2 years of age have limited protection

**Rabies:** The risk of rabies to travelers in rabies-endemic countries (see: [www.who.int/rabnet](http://www.who.int/rabnet)) depends on duration of travel and exposure to rabid mammals. Travelers with extensive outdoor exposure such as bicycling, camping, hiking, or engaging in certain occupational activities, are at higher risk even if their trip is brief. Children are considered at higher risk because of their tendencies to play with animals and to not report bites. Exposure to caves that contain bats is another risk.

**Vaccine:** Inactivated vaccines of cell-culture or embryonated egg origin are considered safe and effective, and are used for pre- and post-exposure prophylaxis. Rabies immunoglobulin is only used for post-exposure prophylaxis.

**Table 4: Pre-exposure vaccination:**

<table>
<thead>
<tr>
<th>Type of vaccine:</th>
<th>Modern cell-culture or embryonated egg vaccine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of doses:</td>
<td>Three, one on each of days 0, 7 and 21 or 28, given Intramuscular IM (1 ml/dose) or i.d. (0.1 ml/per inoculation site)</td>
</tr>
<tr>
<td>Booster:</td>
<td>Not routinely needed for general travelers</td>
</tr>
<tr>
<td>Adverse reactions:</td>
<td>Minor local or systemic reactions</td>
</tr>
<tr>
<td>Before departure:</td>
<td>Pre-exposure prophylaxis for those planning a visit to a rabies-endemic country, especially if the visited area is far from major urban centres where appropriate care, including the availability of post-exposure rabies prophylaxis, is not assured.</td>
</tr>
</tbody>
</table>

*a* For information on which vaccines are recommended for intradermal use, see: [http://www.who.int/rabies/human/postexp/en/index.html](http://www.who.int/rabies/human/postexp/en/index.html)

*b* In the event of exposure through the bite or scratch of an animal known or suspected to be rabid, persons who have previously received a complete series of pre-exposure or post-exposure cell-culture or embryonated egg rabies vaccine should receive two booster doses of vaccine, the first dose ideally on the day of exposure and the second 3 days later. Rabies immunoglobulin does not need to be administered.

**Post-exposure prophylaxis:** Post-exposure prophylaxis to prevent the establishment of rabies infection involves first-aid treatment of the wound followed by administration of rabies vaccine; in the case of category III exposure, rabies immunoglobulin should also be administered.

Strict adherence to the WHO-recommended guidelines for optimal post-exposure rabies prophylaxis virtually guarantees protection from the disease. The administration of vaccine, and immunoglobulin if required, must be conducted by, or under the direct supervision of, a physician. Post-exposure prophylaxis depends on the type of contact with the confirmed or suspect rabid animal, Table 5.

**Table 5: Post-exposure recommendations for prophylaxis, as per World Health Organization**

<table>
<thead>
<tr>
<th>Type of contact, exposure and recommended post-exposure prophylaxis</th>
</tr>
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<tbody>
<tr>
<td><strong>Category</strong></td>
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<tr>
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</tbody>
</table>

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### Post-exposure Management of Rabies

<table>
<thead>
<tr>
<th>Exposure Type</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I</strong></td>
<td>Touching or feeding of animals (Licks on intact skin)</td>
</tr>
<tr>
<td><strong>II</strong></td>
<td>Nibbling of uncovered skin</td>
</tr>
<tr>
<td><strong>III</strong></td>
<td>Single or multiple transdermal bites or scratches, licks on broken skin Contamination of mucous membrane with saliva (i.e. licks) Exposures to bats</td>
</tr>
</tbody>
</table>

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*a Exposure to rodents, rabbits and hares seldom, if ever, requires specific anti-rabies post-exposure prophylaxis.

*b If an apparently healthy dog or cat in or from a low-risk area is placed under observation, the situation may warrant delaying initiation of treatment.

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### Post-exposure Prophylaxis in Previously Vaccinated Individuals

For persons who have previously received a full course of cell-culture or embryonated egg rabies vaccine, post-exposure prophylaxis consists of a series of two booster doses of vaccine given either intramuscularly or intradermally on

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Post-exposure rabies management is essential for those potentially exposed to the lethality of a disease which is 100% fatal. A brief discussion of the specialist management of a traveller potentially exposed to the rabies virus follows, in annotated form. For a fuller discussion the reader is referred to the WHO (www.who.int/ith) for further information.

**Wound treatment:** Thorough washing of the wound with soap/detergent and water, followed by the application of ethanol or an aqueous solution of iodine +/- povidone.

**Passive immunization:** Human rabies immunoglobulin, or equine rabies immunoglobulin, or F(ab')2 products for category III exposure. Human rabies immunoglobulin should be used in case of multiple severe exposure. Passive immunization should be administered just before administration of the first dose of vaccine given in the post-exposure prophylaxis regimen. If it is not immediately available, passive immunization can be administered up until the seventh day after the primary series of post-exposure prophylaxis (with cell-culture or embryonated egg rabies vaccine) was initiated.

**Active immunization:** Cell-culture or embryonated egg rabies vaccines should always be used for post-exposure prophylaxis.

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Post-exposure prophylaxis in previously vaccinated individuals: For persons who have previously received a full course of cell-culture or embryonated egg rabies vaccine, post-exposure prophylaxis consists of a series of two booster doses of vaccine given either intramuscularly or intradermally on
days 0 and 3. It is not necessary to administer passive immunization products. Post-exposure prophylaxis can be stopped if the suspect animal is proved by appropriate laboratory examination to be free of rabies or, in the case of domestic dogs and cats, if the animal remains healthy throughout a 10-day observation period.

**Tick-borne encephalitis (TBE):** Most TBE infections result from tick bites acquired in forested areas. Travelers who walk and camp in infested areas during the tick season (usually spring to early autumn) in temperate regions in Europe and Asia are at potential risk. Countries considered to be at highest risk include Austria, Belarus, Croatia, Czech Republic, Estonia, Finland, Germany, Hungary, Latvia, Lithuania, Poland, Russia, Slovakia, Slovenia, Sweden, Switzerland, and Ukraine. In US troops that trained in a highly endemic area of Bosnia, the estimated rate of TBE infections was 9 per 10,000 person-months of exposure.

**Vaccine:** Two inactivated TBE vaccines are available in Europe, in adult and pediatric formulations: FSME-IMMUN (Baxter Vaccine Ag, Vienna, Austria) and Encepur (Chiron Vaccines, Marburg, Germany—now Novartis). Indirect evidence suggests that their efficacy is around 95%. Because the primary vaccination series requires at least 9 months for completion, most travelers to TBE endemic areas will find tick-bite prevention to be more practical than vaccination. An accelerated vaccination schedule (doses on days 0, 7 and 21 followed by a booster dose 12 – 18 months later is approved.

<table>
<thead>
<tr>
<th>Table 6: Tick-borne encephalitis vaccine schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of vaccine:</strong> Killed</td>
</tr>
<tr>
<td><strong>Number of doses:</strong> Two, given Intramuscular IM 4–12 weeks apart, plus booster</td>
</tr>
<tr>
<td><strong>Booster:</strong> 9–12 months after second dose</td>
</tr>
<tr>
<td><strong>Contraindications:</strong> Hypersensitivity to the vaccine preservative thiomersal; adverse reaction to previous dose</td>
</tr>
<tr>
<td><strong>Adverse reactions:</strong> Local reactions occasionally; rarely fever</td>
</tr>
<tr>
<td><strong>Before departure:</strong> Second dose 2 weeks before departure</td>
</tr>
<tr>
<td><strong>Recommended for:</strong> High-risk individuals only</td>
</tr>
<tr>
<td><strong>Special precautions:</strong> Avoid ticks; remove ticks immediately if bitten</td>
</tr>
</tbody>
</table>

**Typhoid fever:** All travelers to endemic areas are at potential risk of typhoid fever, although the risk is generally low in tourist and business centres where standards of accommodation, sanitation and food hygiene are high. The risk is particularly high in the Indian subcontinent. Even vaccinated individuals should take care to avoid consumption of potentially contaminated food and water as the vaccine does not confer 100% protection.

**Vaccines:** Two typhoid vaccines are currently available: Oral Ty21a is a live, attenuated mutant strain of *Salmonella typhi* Ty21a, supplied as enteric coated capsules, and is given orally in three doses (four in North America) 2 days apart, and produces protection 7 days after the final dose. Seven years after the final dose the protective efficacy is 67% in residents of endemic areas but may be less for travelers. The injectable Vi CPS is a capsular Vi polysaccharide vaccine (Vi CPS), containing 25 µg of polysaccharide per dose. It is given Intramuscular IM in a single dose and produces protection 7 days after injection. In endemic areas, the protective efficacy is 72% after 1.5 years and 50% 3 years after vaccination. Both vaccines are safe and effective. However, their efficacy in children under 2 years of age has not been demonstrated. A combined typhoid/hepatitis A vaccine is also available in some countries.

<table>
<thead>
<tr>
<th>Table 7: Typhoid Fever vaccine schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of vaccine:</strong> Oral Ty21a and injectable Vi CPS</td>
</tr>
<tr>
<td>Number of doses:</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>Booster:</td>
</tr>
<tr>
<td>Contraindications:</td>
</tr>
<tr>
<td>Adverse reactions:</td>
</tr>
<tr>
<td>Before departure:</td>
</tr>
<tr>
<td>Recommended for:</td>
</tr>
<tr>
<td>Special precautions:</td>
</tr>
</tbody>
</table>

*a The duration of protection following Ty21a immunization is not well defined and may vary with vaccine dose and possibly with subsequent exposures to Salmonella typhi (natural booster). In Australia and Europe, 3 tablets are given on days 1, 3, and 5; this series is repeated every year for persons travelling from non-endemic to endemic countries, and every 3 years for persons living in endemic areas. In North America, 4 tablets are given on days 1, 3, 5, and 7 and revaccination is recommended only after 5 years (USA) or 7 years (Canada) for all, regardless of typhoid fever endemcity in the country of residence. |

**Required (as an International Health Regulation) travel vaccines:**

**Yellow fever:** The risk of illness and death due to yellow fever is about ten times higher in rural West Africa than in South America; this risk varies greatly according to specific location and season. Vaccination is recommended for all travelers to countries or areas where there is a risk of yellow fever transmission, see country list at [www.who.int/ith](http://www.who.int/ith).

**Vaccine:** The 17D vaccine is a live attenuated vaccine, given as a single subcutaneous (or intramuscular) injection, and has an efficacy of close to 100%. Duration of protection is thought to be several decades, but the international vaccine certificate is valid for 10 years only. Tolerance of the vaccine is generally excellent. Contraindications include true allergy to egg protein, cellular immunodeficiency (congenital or acquired, the latter sometimes being only temporary) and symptomatic HIV infection. Many industrialized countries administer yellow fever vaccine to persons with symptomatic HIV infection provided that the CD4 count is at least 200 cells/mm³. Asymptomatic HIV-positive individuals may have a reduced response to the vaccine. There is a theoretical risk of harm to the fetus if the vaccine is given during pregnancy, but this must be weighed against the risk to the mother of remaining unvaccinated and travelling to a high-risk zone. (However, pregnant women should be advised not to travel to areas where exposure to yellow fever may occur.) Encephalitis has been reported as a rare event following vaccination of infants under 9 months of age; as a result, the vaccine is contraindicated in children aged under 6 months and is not recommended for those aged 6–8 months.

There have been recent reports of a small number of cases of serious viscerotropic disease, including deaths, following yellow fever vaccination; most of these reactions occurred in elderly persons. The risk of yellow fever vaccine-associated viscerotropic disease appears to be limited to the first immunization. The frequency of such reactions remains uncertain, although estimates based on the Brazilian experience (including routine childhood immunization) indicate a risk in the order of 1 per 10 million doses. Comparative risk estimates from the USA (mainly protection of adult travelers) are about 1 per 200 000–300 000 doses and 1 per 40 000–50 000 doses for vaccinees over 60 years of age. A history of thymus disease has been identified as one of the risk factors.

The risk to unvaccinated individuals who visit countries where there may be yellow fever transmission is far greater than the risk of a vaccine-related adverse event, and it remains important for all travelers at risk to
be vaccinated. Nonetheless, great care should be exercised not to prescribe yellow fever vaccination to individuals who are not at risk of exposure to infection, based on an accurate assessment of the travel itinerary. Yellow fever vaccination should be encouraged as a key prevention strategy, but it is important to screen travel itineraries, particularly of older travelers, and carefully evaluate the potential risk of systemic illness after yellow fever vaccination.

Table 8: Yellow Fever vaccine schedule

<table>
<thead>
<tr>
<th>Type of vaccine:</th>
<th>Live, attenuated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of doses:</td>
<td>One priming dose of 0.5 ml</td>
</tr>
<tr>
<td>Booster:</td>
<td>10-yearly (if re-certification is needed)</td>
</tr>
<tr>
<td>Contraindications:</td>
<td>Egg allergy; immunodeficiency from medication, disease or symptomatic HIV infection; hypersensitivity to a previous dose; pregnancy (see text above)</td>
</tr>
<tr>
<td>Adverse reactions:</td>
<td>Rarely, encephalitis or hepatic failure</td>
</tr>
<tr>
<td>Before departure:</td>
<td>International certificate of vaccination becomes valid 10 days after vaccination</td>
</tr>
<tr>
<td>Recommended for:</td>
<td>All travelers to areas with risk of yellow fever transmission and wherever mandatory</td>
</tr>
<tr>
<td>Special precautions:</td>
<td>Not for infants under 9 months of age; restrictions in pregnancy</td>
</tr>
</tbody>
</table>

Table 9 outlines a proposal of risk criteria in the determinations of recommended travel vaccinations.

Table 9: Proposed Risk Criteria for Determining the Use of Recommended Travel Vaccines*

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Duration of Trip†</th>
<th>Environmental Factor</th>
<th>Host Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza</td>
<td>--</td>
<td>Many long flights, cruises</td>
<td>&gt; 50/65 yr, preexisting disease, small children (?)</td>
</tr>
<tr>
<td>Typhoid</td>
<td>&gt; few weeks</td>
<td>South Asia, north and west Africa, substandard eating places, or off-tourist itinerary</td>
<td>Gastric anacidity</td>
</tr>
<tr>
<td>Rabies</td>
<td>&gt; 1 mo</td>
<td>High endemicity</td>
<td>High exposure: eg, cyclists, work with animals; children</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Any exposure</td>
</tr>
<tr>
<td>Meningococcal disease</td>
<td>&gt; 3 mo</td>
<td>High endemicity</td>
<td>Asplenic</td>
</tr>
<tr>
<td>Japanese encephalitis</td>
<td>&gt; 1 d</td>
<td>Epidemics, meningitis belt</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>&gt; 1 wk</td>
<td>Dry season, meningitis belt</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt; 2-4 wk</td>
<td>Rural areas (rice fields), during season</td>
<td></td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>&gt; 1 mo‡</td>
<td>Close contact with local population</td>
<td>Infants and children</td>
</tr>
<tr>
<td>Cholera</td>
<td>--</td>
<td>Work in refugee camp</td>
<td>Gastric anacidity</td>
</tr>
</tbody>
</table>

*This table refers to recommended vaccines. Vaccination against hepatitis A is recommended by most expert groups for all visits to developing countries.
†Assuming comparatively good hygienic conditions at destination.
‡Only for infants.

4. THE CLINICAL MANAGEMENT OF EMERGENCIES

Anne M. Anglim, Medical Director, Public Health Emergency Management, City of Long Beach, California, USA

The overwhelming majority of patient encounters which occur in the daily conduct of a Travel Clinic will proceed without untoward complication. Nonetheless, travel clinics should be prepared to provide initial resuscitation measures in the event of life-threatening emergency. The most sensible preparations for such rare but potentially catastrophic occurrences will first encompass consideration of the broad categories of emergent scenarios likely to be encountered. Then, policies, protocols, and training can be implemented to both respond to, and prevent their occurrence.

Data regarding the types and frequencies of emergencies encountered in the travel clinic are somewhat limited. One review depicting an ostensibly typical week in an academic travel clinic described 21 patient encounters. One of these visits resulted in a potentially life-threatening complication, in which a patient with a history of asthma developed an acute attack of asthma with hives 3 hours after receiving hepatitis A, influenza, and oral typhoid vaccines.

A history of latex allergies should also be requested, as well as atopy and anaphylaxis. All clinics should use latex gloves, however most latex histories are dermatological ones which are IgG mediated and do not mandate removal of rubber stoppers on vaccine vials. IgE mediated latex allergies are rare but can result in anaphylaxis, so all latex contact should be avoided.

Surveys of emergencies occurring for pediatric out-patient office/clinic setting have been performed. One study found that 62% of family medicine and pediatric office saw at least one child who required
hospitalization or urgent treatment each week. An analysis of rural general practitioners in Australia revealed that physicians saw a median of 8 emergencies per year and 95% of practices experienced one emergency, involving either children or adults, in the previous year.

Whether such information is practically applicable to a travel clinic is uncertain, but such data can underscore the reality that life-threatening incidents occur rarely, but frequently enough to require specific office preparations, with dedicated equipment and staff training. A substantial fraction of travel clinics experience high client volumes, with one worldwide survey finding that 14% of clinics treating more than 5,000 traveller-clients annually. Thus, exigencies of an urgent nature could reasonably be expected in many practices, despite a client population which is perceived as generally reassuringly healthy.

The management of medical emergencies is specifically designated as an integral component of the ISTM ‘Body of Knowledge’ of travel medicine. Further, specific elements related to emergency management have been identified as part of quality assessment reviews.

Table 1 provides a general listing of urgent scenarios most frequently encountered in the outpatient office/clinic setting.

**Hypersensitivity (Allergic) Reactions:**
Hypersensitivity reactions are regarded as the most prominent of potentially life-threatening events encountered in travel clinics. Such reactions can range in severity from mild but annoying local reactions after vaccines, to severe immediate (Type I) hypersensitivity reactions which require rapid intervention on the part of clinic staff.

**TABLE 1 Most Commonly Encountered Office Emergencies**

<table>
<thead>
<tr>
<th>Primary Care Settings (adult + children)</th>
<th>Pediatric Clinical Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute asthma exacerbation</td>
<td>Acute asthma exacerbation</td>
</tr>
<tr>
<td>Psychiatric decompensation</td>
<td>Severe non-asthma respiratory distress</td>
</tr>
<tr>
<td>Seizure</td>
<td>Meningitis/sepsis</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>Seizure</td>
</tr>
<tr>
<td>Anaphylaxis</td>
<td>Apnea</td>
</tr>
<tr>
<td>Impaired level of consciousness</td>
<td>anaphylaxis</td>
</tr>
<tr>
<td>Shock states</td>
<td>Shock states</td>
</tr>
<tr>
<td>Poisonings</td>
<td>Obstructed airway</td>
</tr>
<tr>
<td>Drug overdose</td>
<td>Probable epiglottitis</td>
</tr>
<tr>
<td>Cardiac arrest</td>
<td>Cardiac arrest</td>
</tr>
</tbody>
</table>

**Anaphylaxis (Type I Hypersensitivity Reactions)**
Anaphylaxis is a potentially life-threatening hypersensitivity reaction with manifestations which can involve an array of organ systems (cardiovascular, respiratory, cutaneous, and/or gastrointestinal systems). The most common precipitants for anaphylaxis include foods, especially peanuts, medications, and hymenoptera stings.

A 6-year retrospective review of vaccinations administered to children and adolescents attending 4 large U.S. health maintenance organizations (HMO) found that vaccines seem to rarely trigger anaphylaxis, with 5 cases of potentially vaccine associated anaphylaxis occurring after administration of 7,644,049 vaccine doses, for a risk of ≤ 1.5 cases/million doses. None of these reactions was fatal. Despite methodological limitations contributing to probable underestimation of true incidence, the study also identified a larger proportion of potentially serious hypersensitivity reactions (urticaria, angioedema, erythema multiforme), with a rate of 210 cases/million doses estimated from the provided data.
An important entity in the differential diagnosis of cardiovascular collapse due to anaphylaxis is a vasovagal (vasodepressor) reaction (also known as “fainting”) (Table 3). These events are generally benign, with the major morbidity occurring due to falls, possible overzealous ministrations of family/clinic staff, and anticipatory anxiety for future contacts with health care. Fainting more often occurs in adolescent and adult patients, and complete loss of consciousness is rather rare. Observation and supportive care should be sufficient for most cases, especially having the client lie supine while receiving vaccine and for 10-15 minutes afterwards.

**TABLE 3 DIFFERENTIAL DIAGNOSIS - COMPARISON OF SIGNS/SYMPTOMS**

<table>
<thead>
<tr>
<th></th>
<th>ANAPHYLAXIS</th>
<th>VASOVAGAL REACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypotension</td>
<td></td>
<td>Hypotension</td>
</tr>
<tr>
<td>Nausea and vomiting typically absent</td>
<td></td>
<td>Nausea and vomiting often seen</td>
</tr>
<tr>
<td>Bronchospasm (wheezing), sneezing often seen</td>
<td></td>
<td>Bronchospasm typically absent</td>
</tr>
<tr>
<td>Cutaneous findings (urticaria, flushing) often seen</td>
<td></td>
<td>Pallor, diaphoresis more typical</td>
</tr>
<tr>
<td>Swelling of face, lips, throat (angioedema) can be seen</td>
<td></td>
<td>Swelling should be absent</td>
</tr>
<tr>
<td>Relative bradycardia can be seen</td>
<td></td>
<td>Relative bradycardia typical</td>
</tr>
<tr>
<td>Serum [tryptase] ↑ for 6 hours afterwards</td>
<td></td>
<td>Serum [tryptase] is not elevated</td>
</tr>
<tr>
<td>Progress from onset → collapse occurs over minutes</td>
<td></td>
<td>Progress from onset → loss of consciousness – rapid</td>
</tr>
</tbody>
</table>

Perhaps less well appreciated in the context of significant Type I hypersensitivity reactions is the occurrence of a biphasic response. After treatment of initial symptoms of anaphylaxis, symptoms can recur. The unpredictable and often severe nature of the symptom recurrence spurs the necessity for a period of observation in a hospital setting for all but the mildest of reactions. Characteristics of a biphasic response are outlined in Table 6.

**TABLE 4 Characteristic of biphasic reactions**

Incidence up to 20%; more common when the antigen is food.
May be results of too small a dose of epinephrine or a delay in the administration of epinephrine administered to treat the first phase.
Manifestations can be identical, worse, or less severe than the initial phase.
Most episodes occur within the 1st 8 hours after resolution of the first event, but recurrences have been recorded ≤ 72 hours afterwards.
There is no consistent clinical presentation that predicts the recurrence of symptoms (biphasic reactions).
Clinical importance relates to the length of time patients are observed after successful treatment of the initial reaction.
Recommendations for observation periods have ranged from 2- to 24-hours after the reaction.
Fatalities have occurred in the 2nd phase of the biphasic reaction.
The cause of biphasic reactions is unknown.
In the evaluation of a severe adverse effect temporally associated with vaccine administration, it can be difficult to determine which vaccine constituent may be the offender. Vaccine components that may cause allergic reactions include not only the vaccine antigen (e.g., tetanus toxoid), but also animal protein (e.g., gelatin), adjuvants (alum), antibiotics (e.g., neomycin), and latex contained in vaccine vial stoppers, and syringe stoppers. It should be noted that exposure to many of these substances is difficult to avoid, with clients likely to encounter them in far less controlled settings during the course of their lives. Table 7 provides a (likely non-definitive) listing of major components of some vaccines commonly administered in the travel setting.

**TABLE 5  Major Components of Commonly Used Vaccines (adapted from)**

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTaP (Daptacel)</td>
<td>Aluminum phosphate; ammonium sulfate; casamino acid; dimethyl-β-cyclodextrin; formaldehyde or formalin; glutaraldehyde; 2-phenoxyethanol</td>
</tr>
<tr>
<td>DTaP (Infanrix)</td>
<td>Aluminum hydroxide; bovine extract; formaldehyde or formalin; glutaraldehyde; 2-phenoxyethanol; polysorbate 80</td>
</tr>
<tr>
<td>DTaP (Tripedia)</td>
<td>Aluminum potassium sulfate; ammonium sulfate; bovine extract; formaldehyde or formalin; <strong>gelatin</strong>; polysorbate 80; sodium phosphate; thimerosal (&lt; 3 mcg)</td>
</tr>
<tr>
<td>DT (Sanofi)</td>
<td>Aluminum potassium sulfate; bovine extract; formaldehyde or formalin; thimerosal (&lt; 3 mcg in single-dose vial)</td>
</tr>
<tr>
<td>DT (Massachusetts)</td>
<td>Aluminum hydroxide; formaldehyde or formalin</td>
</tr>
<tr>
<td>Hepatitis A (Havrix)</td>
<td>Aluminum hydroxide; amino acids; formaldehyde or formalin; MRC-5 cellular protein; neomycin; 2-phenoxyethanol; phosphate buffers; polysorbate</td>
</tr>
<tr>
<td>Hepatitis A (Vaqta)</td>
<td>Aluminum hydroxylphosphate sulfate; bovine albumin or serum; DNA; formaldehyde or formalin; MRC-5 cellular protein; sodium borate</td>
</tr>
<tr>
<td>Hepatitis B (Engerix-B)</td>
<td>Aluminum hydroxide; phosphate buffers; thimerosal (&lt; 3 mcg); yeast protein</td>
</tr>
<tr>
<td>Hepatitis B (Recombivax)</td>
<td>Aluminum hydroxyphosphate sulfate; amino acids; dextrose; formaldehyde or formalin; mineral salts; potassium aluminum sulfate; soy peptone; yeast protein</td>
</tr>
<tr>
<td>Hepatitis A/B (Twinrix)</td>
<td>Aluminum hydroxide; aluminum phosphate; amino acids; dextrose; formaldehyde or formalin; inorganic salts; MRC-5 cellular protein; neomycin; 2-phenoxyethanol; phosphate buffers; polysorbate 80; thimerosal (&lt; 3 mcg); vitamins; yeast protein</td>
</tr>
<tr>
<td>Influenza (common to most injectable preparations)</td>
<td><strong>Egg protein</strong>; formaldehyde or formalin; thimerosal (most); <strong>gelatin</strong> (Fluzone); gentamicin (Fluarix); <strong>neomycin</strong> + polymyxin B (Fluvirin); octoxinol-10 (most)</td>
</tr>
<tr>
<td>Influenza (FluMist)</td>
<td>Chick kidney cells; <strong>egg protein</strong>; gentamicin sulfate; monosodium glutamate; sucrose phosphate glutamate buffer</td>
</tr>
<tr>
<td>IPV (Ipol)</td>
<td>Calf serum protein; formaldehyde or formalin; monkey kidney tissue; <strong>neomycin</strong>; 2-phenoxyethanol; polymyxin B; streptomycin</td>
</tr>
<tr>
<td>Japanese encephalitis</td>
<td>Formaldehyde or formalin; <strong>gelatin</strong>; mouse serum protein; polysorbate 80; thimerosal</td>
</tr>
<tr>
<td>Measles (Attenuvax)</td>
<td>Amino acid; bovine albumin or serum; chick embryo fibroblasts; <strong>gelatin</strong>; glutamate; human albumin; <strong>neomycin</strong>; phosphate; sodium phosphate; sorbitol; sucrose; vitamins</td>
</tr>
<tr>
<td>MMR (MMR-II)</td>
<td>Amino acid; bovine albumin or serum; chick embryo fibroblasts; <strong>gelatin</strong>; glutamate; human serum albumin; <strong>neomycin</strong>; phosphate buffers; sorbitol; sucrose; vitamins</td>
</tr>
<tr>
<td>Meningococcal (Menactra)</td>
<td>Formaldehyde or formalin; phosphate buffers</td>
</tr>
<tr>
<td>Meningococcal (Menomune)</td>
<td>Lactose; thimerosal (10-dose vials only)</td>
</tr>
<tr>
<td>Mumps (MumpsVax)</td>
<td>Amino acid; bovine albumin or serum; chick embryo fibroblasts;</td>
</tr>
</tbody>
</table>
A history of anaphylaxis to a vaccine component is a contraindication to receipt of that particular vaccine. Furthermore, those who have had an anaphylactic reaction to a specific vaccine should not receive subsequent doses of that vaccine preparation, Desensitization may be possible in some patients with immediate-type hypersensitivity reactions (e.g., among people with tetanus toxoid allergy), and a referral to an allergy/immunology specialist may be advisable.

It should be noted that most patients who report a history of allergy to neomycin have had problems with contact dermatitis, this is not a contraindication to administration of vaccines containing this substance, but a history of a type I hypersensitivity reaction does preclude administration of such vaccines. The ubiquitous nature of neomycin in vaccine preparations underscores the need for obtaining detailed allergy histories in clinic clients.

Historically, anaphylactic reactions which have occurred after administration of certain vaccines (MMR) have been attributed to allergy to the small amounts of egg proteins in the cell cultures used to grow the component measles and mumps viruses. More recent data suggest that a significant proportion of anaphylactic reactions to MMR and Japanese encephalitis vaccines occur through a different mechanism.

Anti-gelatin IgE antibodies, formed after prior receipt of sensitizing diphtheria-tetanus-acellular pertussis (DTaP) or varicella vaccines, may be the anaphylactic stimulant for many affected recipients.

Figure 1 (below) provides an algorithm for the initial clinical management of anaphylactic reactions.

*Manufacturers of vaccines may have changed product contents, and therefore package inserts should be reviewed for definitive information related to vaccine products.
Other Serious Adverse Reactions to Medications/Vaccines:

Potentially life-threatening adverse drug reactions (ADRs) or drug-drug interactions

Fatal adverse drug reactions have been estimated to cause approximately 106,000 deaths annually in United States hospitals. In the clinic setting, studies found that between 17% and 25% of ambulatory primary care clinic patients reported ADRs, with > 50% of these were considered serious. Table 8 lists characteristics of adverse drug reactions.

<table>
<thead>
<tr>
<th>TABLE 6 Classification of adverse drug reactions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Example</strong></td>
</tr>
<tr>
<td>Predictable</td>
</tr>
<tr>
<td>Overdosage</td>
</tr>
<tr>
<td>Side effect</td>
</tr>
<tr>
<td>Secondary effect</td>
</tr>
<tr>
<td>Drug–drug interaction</td>
</tr>
</tbody>
</table>

Unpredictable reactions occur only in susceptible individuals, are dose-independent, and not related to the pharmacologic actions of the drug. (about 20% of all adverse drug reactions – most apt to be fatal)

Intolerance | acetazolamide | paresthesias |
Idiosyncratic | primaquine | Hemolysis in G6PD-deficiency |
Allergic | Penicillins, etc. | anaphylaxis |
Pseudoallergic (anaphylactoid) | Radiocast, opiates, NSAIDs | Clinically similar to anaphylaxis |

Avoidance of ADRs and serious drug-drug interactions requires obtaining a complete medication history from travel clinic clients. Frequently overlooked is the importance of over-the-counter medications, and herbal/nutritional supplements; these often must be specifically sought. The benefits of certain prophylactic/presumptive treatment medications for an individual travel itinerary must often be weighed against the often complex medical challenges of a patient.

While package inserts of prescription medications universally contain an exhaustive list of potential adverse effects and drug-drug interactions, certain of the more potentially serious ones can be highlighted (Table 9)

<table>
<thead>
<tr>
<th>TABLE 7 SELECT POTENTIALLY LIFE-THREATENING ADRs &amp; DRUG INTERACTIONS in a Travel Clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DRUG</strong></td>
</tr>
<tr>
<td>Anti-malarials</td>
</tr>
<tr>
<td>Choroquine</td>
</tr>
<tr>
<td>Mefloquine</td>
</tr>
<tr>
<td>Atovaquone-proguanil</td>
</tr>
<tr>
<td>Doxycycline</td>
</tr>
<tr>
<td>primaquine</td>
</tr>
</tbody>
</table>

Anti-bacterials (for Travelers’ Diarrhea)

Ciprofloxacin/levofoxacin | C. difficile colitis, CNS toxicity, dysglycemias, | Anti-arrhythmics, divalent cations, NSAIDs, Cyclosporine, tacrolimus |
| Azithromycin | | |

For Altitude Illness

acetazolamide | Cross-reacts with penicillins > sulfa derivative | Diuretics (↑ risk hypokalemia) |
Medical Emergencies Specific to Returning Travelers (see Table 8)

For a more appropriately detailed discussion, please see references 19, 20, among others. It is imperative that Travel Clinics which evaluate and treat returning travelers possess an understanding of clinical syndromes which mandate immediate action. Such disease entities may:

- Be rapidly fatal without specific therapies
- Require specialized laboratory facilities for diagnostic testing
- Be readily transmissible to other persons
- Mandate immediate public health interventions
- Any combination of the above.

It is noteworthy that initial reports of the spread of Severe Acute Respiratory Syndrome (SARS) outside of Asia was by astute clinicians in Toronto, Canada evaluating returning travelers with respiratory symptoms.

TABLE 8 Potential Medical/Public Health Emergencies in the Returning Traveler

<table>
<thead>
<tr>
<th>SYNDROME</th>
<th>EXAMPLES</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever - undifferentiated</td>
<td>Malaria; rickettsial infections; lassa fever; leptospirosis; meloidosis; Dengue; chikungunya fever</td>
<td>There is considerable overlap amongst the syndromes</td>
</tr>
<tr>
<td>Fever – with hemorrhage</td>
<td>Dengue hemorrhagic fever; lassa fever; yellow fever; Ebola/Marburg HF; Crimean-Congo HF; hemorrhagic fever with renal syndrome</td>
<td></td>
</tr>
<tr>
<td>Fever + rash</td>
<td>Measles; Anthrax; poxviruses;</td>
<td></td>
</tr>
<tr>
<td>CNS findings ± Fever</td>
<td>Bacterial-fungal-protozoal meningitis; brain abscess; encephalitis; human African trypanosomiasis; rabies</td>
<td></td>
</tr>
<tr>
<td>Fever + GI symptoms</td>
<td>S. typhi/paratyphi</td>
<td></td>
</tr>
<tr>
<td>Fever + respiratory symptoms</td>
<td>Influenza (seasonal, avian, pandemic) Legionnaire’s disease; tuberculosis; Y. pestis; diphtheria; hantavirus pulmonary syndrome; inhalational anthrax</td>
<td></td>
</tr>
<tr>
<td>Syncope, chest pain, dyspnea</td>
<td>Deep venous thrombosis; pulmonary venous thromboembolism</td>
<td></td>
</tr>
<tr>
<td>Any</td>
<td>Complications related to medical tourism e.g. Surgical site infections; catheter-related bloodstream infections</td>
<td></td>
</tr>
</tbody>
</table>

Other Medical Emergencies:
- Acute Coronary Syndromes (Myocardial Infarctions/Unstable Angina)
- Pulmonary Venous Thromboembolism
- Seizures (Generalized Tonic-Clonic Events)
- Hypoglycemia

Emergency Equipment Considerations (see Table 11)

The scope of training, medications and equipment will be influenced by several factors:

- The volume and types of clinical visits encountered in the clinic. A clinic may be dedicated to travel issues only, or it may provide urgent evaluations of returning travelers, or the travel clinic could be a component of a general medical or specialty practice)
- The level of training (and whether such training is kept current) and comfort of assessment, diagnosis and management of the clinic staff
• The physical proximity of the clinic facility to definitive hospital care
• The response time of local Emergency Medical Systems (EMS)
• Budgetary constraints on purchase of equipment, medications, and staff training which may never be needed. In limited economic times, such items may be the first to be eliminated from the ledger.

As a minimum:
• Clinic staff members should maintain current certification in cardiopulmonary resuscitation (CPR), basic first aid practice.
• Any emergency equipment must be kept up-to-date, functional, and restocked if any items are used. The location of this kit should be known to all staff.
• Written management protocols should be devised, preferably on laminated cards for convenient referral in an emergency.
• Regular emergency drills can help keep staff confident in their abilities to use equipment and perform in their specified role.
• It is essential that one staff member be assigned responsibility to contact emergency medical services, and that another staff member be assigned to document treatment measures given, and time of administration

<table>
<thead>
<tr>
<th>TABLE 11 POSSIBLE EMERGENCY EQUIPMENT FOR TRAVEL CLINICS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Equipment</strong></td>
</tr>
<tr>
<td>Blood pressure cuff (all sizes)</td>
</tr>
<tr>
<td>Bag mask ventilator (two sizes, three mask sizes)</td>
</tr>
<tr>
<td>Glucose meter + strips + lancets</td>
</tr>
<tr>
<td>Intraosseous needle (18 and 16 gauge)</td>
</tr>
<tr>
<td>Intravenous catheter/butterfly needles (24-18 gauge)</td>
</tr>
<tr>
<td>Intravenous extension tubing and T-connectors</td>
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<tr>
<td>Universal precautions (latex-free gloves, mask, eye protection)</td>
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<tr>
<td>Nasal airways (one set)</td>
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<tr>
<td>Nasogastric tubes</td>
</tr>
<tr>
<td>Nebulizer/metered dose inhaler spacer, face masks</td>
</tr>
<tr>
<td>Non-rebreather (three sizes)</td>
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<tr>
<td>Oxygen mask (three sizes)</td>
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<tr>
<td>Oxygen tank and flow meter</td>
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<tr>
<td>Portable suction device/catheters, or bulb syringe</td>
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<tr>
<td>Portable suction device/catheters, or bulb syringe</td>
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<tr>
<td>Pulse oximeter for child and adult usage</td>
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<tr>
<td>Resuscitation tape (color-coded)</td>
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</tbody>
</table>

Possible (for very busy, high-risk practices): Epinephrine (1:10,000 – for cardiac arrest)
AED (Automatic External Defibrillator)
Pre-packaged kits of emergency drugs/supplies can be conveniently purchased:
http://www.statkit.com/
FIGURE 1: Anaphylaxis Algorithm

**Initial Measures:**
1. Establish airway patency (oral airway if needed)
2. Check Vital Signs
3. Administer epinephrine (Adrenaline) (1:1,000) (0.01 mL/kg – max 0.5 ml) sq x 1 (or Epi-Pen auto-injector)
4. Give 100% oxygen by facemask
5. Place patient supine, optimally in Trendelenberg position

If Inadequate Response:
6a. Start intravenous (IV) access with dextrose 5% or D5/0.9% normal saline
7a. Administer H1 & H2 antagonists IV (e.g.)14:
   - diphenhydramine 50 mg + ranitidine 50 mg
8a. Administer IV methylprednisolone 0.5 mg/kg q 6 hours (OR IV hydrocortisone 5 mg/kg q 6 hrs)

If Good Response:
6b. Start IV access with heparin lock
7b. Administer H1 & H2 antagonists PO (e.g.) 14:
   - diphenhydramine 50 mg + ranitidine 150 mg
8b. Administer PO corticosteroid
   (prednisone/prednisolone)

**Ongoing Management:**
9a. Contact ambulance/EMS (911) for urgent transfer to hospital emergency department
10a. Epinephrine dosing can be repeated every 15-20 minutes, as required.
   Consider IM administration for severe reactions. (or use Epi-Pen)

11a. In case of profound hypotension, IV 0.9% normal saline + vasopressors* should be given, if available.
12a. If pt received SQ vaccine, additional aqueous 1:1,000 SQ epinephrine (0.005 mL/kg – max 0.3 mL) into site of vaccine administration MAY ↓ absorption of the presumed causative vaccine.

13a. If pt is on concurrent β-blockers, consider administration of glucagon 1 mg IV and atropine IV.
14. If pt has no palpable pulse/respirations, begin CPR ± advanced life support (ACLS/PALS) protocol, if able.

**Referral:**
- Patient should be referred to hospital emergency department for all but the mildest reactions.
- Biphasic (late-phase) response can be seen in any Type I reaction (≤ 50% cases); therefore, all patients should be monitored for 8-12 hours

**Continuous infusion of IV epinephrine (adrenaline) at a dose of 0.00015 mg/kg/min can be given (adult dose is 1 mL/min of a concentration of 1 mg in 100 mL)**

**Ongoing Referral**
Patient’s primary physician should be notified, with a goal of preventing future incidents.
REFERENCES:


5. THE SPECIAL NEEDS TRAVELER
I. Dale Carroll, Medical Director, The Travel Doctor, USA

THE TRAVELER WITH DISABILITIES
Quick Summary: While the “Disabled Traveler” most often brings to mind the person with diminished mobility, this group also includes the hearing or vision impaired, the mentally impaired and other types of disabilities. In all of these cases travel rarely needs to be restricted, but special advance preparations are usually required.

Paperwork: Insurance will be required to cover not only the special needs of the traveler but also loss or damage to specialized equipment or harm to service animals. Such animals (e.g. guide dogs) may also require extensive pre-travel paperwork.

Pre-travel check-up & Counseling: The traveler (and service animal, if there is one) should have a thorough pre-travel medical examination by their personal physician. Specific needs should be discussed with the travel agent who is apt to be unfamiliar with them. Extra time may need to be scheduled between flights and extra effort made to communicate with gate agents and other travel personnel regarding assistance with equipment or baggage, ground transportation and communicating instructions in a manner that the traveler can understand. Flight attendants may need to assist with opening food packages or identifying their contents. Depending on the type and degree of disability, and the perceived safety risk that the traveler presents to other travelers, the air carrier may require the presence of an attendant (who often may travel at a discount.) Lodging and ground transportation at the destination need to be appropriate to the traveler’s needs and be made aware of those needs. Many developing countries are not prepared to the needs of disabled travelers. On cruises, special arrangements may need to be made for disembarkation at some ports.

Vaccination: Vaccination rarely needs to be any different than that required for other travelers.

Medications and devices: When possible, the patient should travel with a small, lightweight wheelchair rather than an electric one or scooter. A repair kit, extra batteries (preferably dry cell rather than liquid) and voltage adapters should accompany the equipment, and if disassembly will be required airline personnel need to have appreciate written instructions. Remember that cushions and other removable parts will likely be removed.

Service animals: Service dogs will need health certification prior to travel and perhaps to re-enter the home country as well. Appropriate identification and health tags should be attached to a preferably non-metallic collar or harness. The dog should be exercised and allowed to void and not fed just prior to boarding. It will usually be allowed to travel on board the plane, on certain flights, if not obstructing an aisle.

Medical access: As medical care is often needed at the destination, it is important that appropriate medical providers be identified prior to travel and appointments made in advance if necessary.

THE IMMUNOCOMPROMISED TRAVELER
Definitions: We combine here information regarding patients who are immunosuppressed due to cancer and other chemotherapy, transplantation, asplenia, and immunosuppressive diseases such as AIDS. As these conditions are quite disparate, advice will need to be individualized depending on the condition involved.

Quick Summary: These patients usually may travel but need to be more rigorous than most in matters of prevention. Live vaccines and BCG may be contraindicated but others are especially important. Some may not produce an adequate immune response. Medication interactions are another important problem.
**Paperwork:** Appropriate insurance is important but may be problematic. It is a good idea for these patients to carry a copy of pertinent medical records. Border crossings may be problematic for patients with HIV, especially those planning long stays.

**Pre-travel check-up & Counseling:** Functional asplenia may occur in association with a number of disease conditions in addition to surgical splenectomy. Splenectomy for hematological disease may result in greater risk than splenectomy following trauma. **Asplenic patients should be counseled to carry an appropriate antibiotic for fever to ensure immediate treatment SHOULD FEVER OCCUR.**

Persons who have undergone bone marrow transplantation are more severely immunosuppressed than are solid organ recipients, and are considered functionally asplenic. It is important, whenever possible, to delay travel beyond the most vulnerable period—up to two years after splenectomy or bone marrow transplantation, several months after chemotherapy, and several weeks after any change in immunosuppressive medication. As a general rule, travelers with a peripheral CD4+ lymphocytic count over 200 cell/μL may receive routine vaccinations and medical prophylaxis.

**Vaccinations:** Family members and fellow travelers may need to be vaccinated with live virus vaccines to protect the compromised individual. Live vaccines are contraindicated for most immunocompromised travelers and should be avoided for at least 3 months after completion of cancer chemotherapy. The MMR vaccine is contraindicated within the first 2 years after transplant.

Travelers to countries requiring yellow fever vaccination, and for whom it is contra-indicated, should be provided with a waiver. Asplenic patients respond poorly to polysaccharide vaccines and a conjugated vaccine should be used when available. Overall, transplant recipients and sometimes patients post-cancer chemotherapy have weaker and less durable antibody responses than normal individuals. There have been anecdotal reports of rejection associated with influenza vaccine. BCG vaccine is always contraindicated. Inactivated vaccines are preferable to live ones for polio, typhoid and cholera. Rabies vaccine is always indicated following exposure, but frequent titers may need to be drawn and booster doses given to obtain an adequate response.

**Medications:** Immunosuppressive agents potentially overlooked by travel medicine providers include corticosteroids, methotrexate, cyclophosphamide, infliximab, etanercept and adalimumab. Due to poor response to vaccines, it may be prudent to supply immunosuppressed patients with prophylactic antibiotics. If a patient develops a serious infection, the immunosuppressive agents may need to be stopped while treating the infection and higher than usual doses of antibiotics may be required. The possible interactions between these drugs and other commonly prescribed drugs are numerous and potentially clinically important. These patients should avoid taking other non-prescription medications that could lead to potentially serious toxic drug interactions. Antiretroviral drugs should be carried in hand-baggage to avoid loss while abroad, since antiretroviral drugs are not available everywhere in the world.

**Food-borne illness:** Intracellular pathogens pose the greatest risk to transplant recipients and HIV-infected patients. They should not eat any raw or undercooked meat. Also, they should avoid sausages, casseroles or raw or undercooked eggs or foods that may contain them as well as soft cheeses and raw or undercooked seafood.

**Blood-borne illness:** Viral hepatitis is particularly dangerous in HIV-infected patients and vaccination is recommended. Health-care workers with these conditions are at additional risk and may require initiation of highly active antiretroviral post-exposure prophylaxis. Casual sex during travel may have life threatening consequences to the traveler or transmit disease (HIV) to the sexual partner.
**Air-borne illness:** Pneumococcal disease, *Haemophilus influenzae*, *Babesia spp.* and *Neisseria meningitidis* carry a risk of overwhelming sepsis in the splenectomized patient. Infections which pose most risk for hematologic transplant recipients are such pathogens as cytomegalovirus (CMV disease), adenoviruses and invasive mold infections.

**Insect-borne disease:** Precautions for malaria do not differ from those for immunocompetent travelers, but these patients require urgent evaluation of any fever. HIV infection is a predisposing factor for higher parasitemias and *Plasmodium falciparum* infection has been demonstrated to possibly accelerate HIV progression. The effects of chloroquine or mefloquine upon levels of immunosuppressive medications are not fully known and drug levels may need to be evaluated. Dengue may possibly enhance the risk of hemorrhage in people with thrombocytopenia.

**Environmental issues:** Hydration is especially important when taking certain medications in hot climates. Transplant recipients have an increased risk of skin cancers, and prolonged sun exposure should be avoided to prevent photosensitivity reactions associated with drug therapy. Bathing in pools or rivers and walking barefoot may increase the risk of skin mycotic, bacterial or helminthic infections. Overwhelming strongyloidiasis and septic shock are higher risks for these groups.

**THE PREGNANT TRAVELER**

**Quick Summary:** While most of the questions that arise regarding pregnancy and travel revolve around immunizations and medications, the really important issues are food and water precautions, adequate rest, and where to find help in case of emergency.

**Paperwork:** Pregnant travelers will often need a copy of their prenatal record, a waiver from their obstetrician, and sometimes even a letter from their spouse allowing them to travel unaccompanied. They will also need medical and evacuation insurance that covers pregnancy-related issues—often very difficult to find.

**Pre-travel check-up & Counseling:** Pre-travel evaluation should include an ultrasound to establish a reliable due date and rule out abnormalities such as an ectopic pregnancy. Laboratory studies should include a blood type and antibody titers for vaccine-preventable diseases. Counseling should include how to recognize pregnancy complications and what to do when they occur, including the location prior to the trip of medical providers to be contacted in case of emergency. Comfort measures should prepare for problems such as pedal edema, bloating and hemorrhoids and DVT prevention. The itinerary should allow for adequate rest along the way and means of transportation should be chosen that minimize exposure to insects and communicable diseases.

**Vaccinations:** Vaccinations cause great concern in pregnancy but it should be remembered that the diseases they prevent are a far greater threat to the pregnancy than are the vaccines. Every attempt should be made, of course, to prevent the exposures that would necessitate the vaccines. But virtually all routine vaccines are considered safe to give in pregnancy, the only exceptions being the live virus vaccines. Even these might be considered if disease exposure will be significant and unavoidable. One can be reassured by the fact that inadvertently given vaccines have rarely been shown to cause harm. Of some concern is that yellow fever vaccine may not provide adequate immunity when given in pregnancy. The gastrointestinal upset caused by the live, oral vaccines may be more problematic in pregnancy, therefore injectable vaccines, if available, may be more appropriate. High core temperatures due to an adverse effect from vaccination should be avoided.

**Medications:** As with vaccinations, most of the medication fears with pregnancy are outweighed by the seriousness of the diseases they prevent or treat. Very few medications are known to be teratogenic. Possibly of greater concern is that the physiologic changes that accompany pregnancy often result in
more rapid metabolism and lower circulating levels of medication. Thus the normal doses may be subtherapeutic in the pregnant woman.

**Food-borne illness:** Decreased gastric acidity and slowed intestinal motility mean that traveler’s diarrhea is apt to be more common and more severe during pregnancy. Hepatitis E has a high mortality rate in pregnancy and Hepatitis A may cause an increase in prematurity. Unpasteurised cheeses or milkfood should be avoided as listeriosis and toxoplasmosis pose higher risk during pregnancy. For these reasons food and water precautions are of increased importance during pregnancy. The mainstay of diarrhea treatment is vigorous oral hydration, but this may be supplemented with antibiotics when necessary.

**Breast-feeding:** As a general rule, the advantages of breast feeding outweigh low risk to the fetus if any drug therapies are required.

**Blood-borne illness:** Because of the risk of neonatal transmission, Hepatitis B vaccination is of added importance during pregnancy.

**Air-borne illness:** Influenza can rapidly progress to pneumonia in pregnancy. Influenza vaccine is recommended for all pregnant women regardless of gestational age.

**Insect-borne disease:** *Anopheles* mosquitoes (and perhaps others) are preferentially attracted to pregnant women and malaria can be devastating in pregnancy. Bite-prevention measures are very important, therefore, as is medical prophylaxis. Doxycycline is not recommended beyond the first trimester and primaquine should not be used in pregnancy.

**Environmental issues:** Due to physiologic changes in pregnancy, heat and humidity can cause greater problems. Brief exposure to moderate altitude (e.g. 2500-3000 meters) should not be problematic except in already compromised pregnancies. The main concern with altitude exposure is that most such exposures occur far from available medical care. Accidents and falls are likely to be more frequent and, once again, appropriate medical care is often delayed because of fear of harming the fetus.

**PEDIATRIC AND ADOLESCENT TRAVELERS**

**Quick Summary:** Adults traveling with children need to think from the child’s perspective. Planning, preparation and frequent stops for rest, food and hydration are all essentials to rewarding pediatric travel. Traveling with children also requires more than usual attention and responsibility taking on the part of the adults.

**Paperwork:** Health and evacuation insurance are especially important. With a child who has a chronic illness, it is important to take along medical records. A parent traveling alone with a small child may need documentation from the other parent giving permission to take the child across international boundaries.

**Pre-travel check-up & Counseling:** Children with chronic medical conditions need a pre-travel examination and possibly medication adjustments from their pediatrician. Travel plans should include provision for snacks and drinks, changes of clothing and toys or other distractions. Airport layovers should be minimized. Child restraints, while essential for automobile travel, are a matter of debate in air travel. Aboard an aircraft, however, the child should not share a seat belt with an adult.

**Vaccinations:** Routine immunizations should be up to date and if prolonged stays are anticipated, an “accelerated” schedule may be helpful. Premature infants should be immunized according to their chronological, not gestational age. Some vaccinations, although not “approved” for younger children, may still be safe to give and provide some protection when disease exposure is likely. Yellow fever and Japanese encephalitis vaccines may need to be considered depending on destination and duration of stay.
Medications: A first-aid kit should be prepared with the child in mind. The use of sedatives or decongestants is debatable. If they are to be used, a test dose should be given prior to travel. Doxycycline is not recommended for children under 8 years old, and in adolescent girls it may result in vaginal candidiasis. Attention deficit disorder or a remote history of febrile convulsions does not contraindicate the use of mefloquine.

Food-borne illness: Breast feeding is the best preventive in infants. Infants tend to have diarrhea more commonly than older children and it is apt to last longer and be more severe. Treatment consists primarily of vigorous oral hydration (oral rehydration packets or recipes are available) with the addition of appropriate antibiotics (including fluoroquinolones) if indicated. Antimotility or bulking agents should be avoided.

Blood-borne illness: Children tend to require medical care more often than adults and in many countries this involves injections. Parents need to watch for sterile technique. Older children should be warned against the dangers of sexual contact, body piercing and tattooing.

Air-borne illness: Strangers often are attracted to infants and toddlers, thus increasing their exposure to respiratory illnesses. Playing with other native children may also do this.

Insect-borne disease: Bite avoidance measures include appropriate clothing, environmental barriers, environmental and clothing insecticides, and scheduling outdoor activities to minimize exposure. Even the location of play areas can be chosen to be away from mosquito breeding sites and sandfly habitats. Insect repellents can be safely used in children. Insect bites need to be cleansed and covered to prevent infection from scratching. Medical prophylaxis against malaria is as important (or more) in children as adults. Clothing to protect against ticks and a daily “buddy body search” to remove ticks may be important in some areas.

Environmental issues: Footwear is an important protection against hookworm and other soil parasites. Altitude sickness occurs in infants and children with the same frequency as adults but the symptoms may not be as typical. There is little data regarding the use of acetazolamide in children but it appears to be safe in appropriate doses. Adolescents and older teens are more likely to engage in risk-taking activities when traveling and need to be supervised as well as warned against the use of drugs and alcohol. Sunburn, drowning, coral injuries and contact with poisonous or dangerous marine animals are all dangers to keep in mind while swimming, and young children especially need to be prevented from contact with stay or wild animals. Children may become separated from parents, so contingency plans and places to meet need to be planned in advance.

THE TRAVELER THAT VISITS FRIENDS AND RELATIVES (VFR)

Quick Summary: The travel industry identifies a large portion of international travelers as “visiting friends and relatives” but this includes many first-world travelers going to developed countries whose trip includes visits to friends and family. Although these travelers may be at some increased risk of illness, the “Visiting Friends and Relatives” (or VFRs) most commonly though of in travel medicine circles are ethnic or immigrant travelers who have usually resided for a time in a developed country and are now returning home to an undeveloped country to visit. Travelers of this type usually represent about 6% of the population in a developed country but represent about 20% of international travelers. This group is at substantially increased risk for many types of illness and injury, but predominantly infectious diseases. These affect not only the individual travelers but also have the potential for being a public health risk to the host country upon return.

Paperwork: Medical and evacuation insurance are often absent in this group. They may also need to insure before leaving that they have adequate documentation to return to the country of departure. Medical records are often in a foreign language, which may be problematic to the medical provider.
Pre-travel check-up & Counseling: Reasons for lack of pre-travel preparation in this group include lack of finances, lack of accessibility to medical care, cultural and language barriers and the failure to see the need for such preparation. The types of morbidity to be expected will differ depending on the purpose of the trip. (For instance, travel to rural Africa to visit relatives carries different risks than a pilgrimage to Mecca.) Crowded and unsanitary living conditions may prevail at the destination.

Vaccinations: Establishing whether routine immunizations are current may be problematic if records are either non-existent or in a foreign language. Patients who have lived for long periods in areas endemic for Hepatitis A & B and Japanese encephalitis may have had the disease or been vaccinated previously and benefit from antibody testing instead of vaccination.

Medications: Regular medications that these patients take may not be available in their home country or may be called by a different name. Also, medications commonly used in developing countries may be counterfeit, or of unproven effectiveness, or interact unfavorably with other medicines.

Food-borne illness: Studies have shown ethnic travelers to be as much as eight times as apt to get hepatitis A as other travelers, and children twice as likely as adults. Children of VFRs, if they do get the disease, are likely to have a more severe course than other children, perhaps due to a heavier inoculum. VFRs are also at increased risk of typhoid. In fact, in one study in the United Kingdom, all typhoid and paratyphoid cases in a two year period occurred in VRF travelers.

Blood-borne illness: VFRs travelling to certain countries are at increased risk for sexually transmitted diseases, including HIV. In one study of ethnic travelers to Africa 40% of the men and 21% of the women had a new sexual partner during the trip. In addition, as they are more likely to receive medical care from local practitioners, there is the added risk of injection with an unsterile needle.

Air-borne illness: Developing countries have rates of tuberculosis 5-100 times higher than found in developed countries. Even in countries like the USA and UK an increasing proportion of tuberculosis is found in ethnic travelers, often of drug-resistant varieties. Appropriate protective measures, therefore, are warranted and post-travel diagnostic tests may be indicated.

Insect-borne disease: Malaria is one of the commonest and most important infections acquired by ethnic travelers. Attack rates may be as high as 1.7% per visit to West Africa. Sub-Saharan Africa and the Indian Subcontinent are the primary sources of malaria in these travelers. Studies of travelers to India from Canada and Europe have shown only 28-31% using malaria prophylaxis, while data from Italy showed that 92.6% of ethnic travelers to malaria endemic areas had used no prophylaxis.

Environmental issues: Ethnic travelers are more apt to swim in local bodies of fresh water, come in contact with poisonous plants and animals, use cheaper (and more dangerous) methods of land transportation, and visit areas with higher rates of crime.

Public health issues: Statistics from the Netherlands have shown annual fluctuations in the incidence of Hepatitis A that reflect travel by ethnic minorities and subsequent spread of disease to the Dutch population. In the UK and other areas the predominance of HIV is in ethnic minorities, many of whom have acquired the disease in their visits to their home countries. As mentioned above, the burden of tuberculosis also tends to be increasingly in ethnic travelers. Thus the infectious diseases acquired by these travelers can present a public health threat when they return to their host countries.

THE TRAVELER WHO IS AN EXPATRIATE AND/OR AN HUMANITARIAN WORKER
**Quick Summary:** Prolonged stays and working in remote areas under often dangerous conditions means that this group needs to pay extra attention to psychological issues and personal security and needs to be more self-reliant when it comes to medical care. They also need extra acclimatization to the local culture.

**Paperwork:** There are often many additional forms to be completed as required by the sending agency or for special visa applications. It is important that these patients keep a copy of any pertinent medical records and that they carry adequate health and medical evacuation insurance.

**Pre-travel check-up & Counseling:** Physical examination should be thorough, seeking to identify not only current problems but also early signs of those that might develop during a prolonged stay. Attention should be paid to conditions that might worsen in a different environment such as a high altitude. A professional psychological evaluation may also help the patient to prepare for the added stresses of this type of posting. Time needs to be spent in teaching the patient about the culture in which he or she will be living. The patient should be counseled on care for personal health, sexual health, risk-taking recreation, stress management, diet, exercise and the use of drugs and alcohol.

**Vaccinations:** Routine vaccinations need to be current along with a look ahead to those which may expire while overseas. Long-stay and remote travelers may also need added vaccinations such as rabies, BCG and Japanese encephalitis.

**Medications:** Medications may need to be changed to those that are available in the country of assignment, or arrangements made to transport them periodically from the home country. Self-diagnosis and self-treatment may need to be integral to any needed medical care, to be supplemented perhaps by telemedical care via Internet or satellite telephone. Medical evacuation is often simply not available when most needed, and expatriates are apt to be slow to use it because of disruption to the task at hand and separation from support persons. A carefully chosen medical kit is essential, along with instructions on how to use it.

**Food-borne illness:** Risk of traveler’s diarrhea will remain the same as that of short-term travelers for about 2 years and subsequently may show seasonal or regional variation. The patient needs to be familiar with long-term methods of water purification such as filtration or boiling, and with food preparation and preservation in suboptimal environments.

**Blood-borne illness:** HIV and Hepatitis B exposure is an added risk for aid workers and expatriates, from occupational exposure, substandard medical care or from rape or sexual exposure. Protocols and medical provision need to be in place for potential exposure.

**Air-borne illness:** There is an increased risk of tuberculosis exposure with prolonged and intimate stays. Pre-posting tuberculosis testing is warranted and in some cases perhaps vaccination with BCG.

**Insect-borne disease:** The incidence of malaria in expatriates can be over 200/1000 per year in some areas. Attention should be paid to housing, personal protective measures and medical prophylaxis. Adjustments may sometimes be made for seasonal or geographic variation, but the risk is often greater than what is purported by other local expatriates and the consequences more devastating. A multitude of other insect-borne diseases may be significant threats as well, depending on location.

**Environmental issues:** Motor vehicle accidents are the leading cause of death among missionaries and Peace Corps Volunteers. Unsafe means of transportation, unsafe roads and remoteness from care all contribute to this. Means of transportation, destination and times of travel must be chosen carefully and all available safety measures used. Water safety and drowning may be another major safety issue.

**Crime and Security:** This type of traveler is frequently a target for violent crime or kidnapping, due variously to the type of work involved, the population being served, the local political situation and the
remote from police protection. Plans and protocols need to be in place to prevent violence as well as an appropriate response when it is apt to or does occur. Travelers should also agree in advance that they will follow these protocols when the situation arises. Provision needs to be made for post-traumatic debriefing and counseling.

THE TRAVELER TO REMOTE DESTINATIONS

Quick Summary: This group is composed not only of expeditions and adventure travelers but also hunters, employees of petroleum and other companies, and intelligence and armed service personnel. They require not only extensive medical preparation but also arrangements for in-country security, legal and medical services. Medical evacuation is often not an option and satellite telephones or other means of communication may be essential.

Paperwork: Travel to remote locations often requires special permits as might the transportation of complex medical kits.

Pre-travel check-up & Counseling: Many adventure travel companies pay little attention to traveler safety and the responsibility for this falls to the traveler and the travel medicine provider. Medical screening should pay special attention to unrecognized or untreated medical, dental or psychiatric conditions. Chronic pulmonary, neurologic or cardiac conditions or such problems as drug or alcohol dependence require special care.

Vaccinations: All vaccinations, routine and travel-related, should be chosen both on the basis of likely exposure and on the assumption that they will not be available at the destination. Some specialty vaccines such as plague, encephalitis and anthrax may be advised.

Medications: Routine medications may need to be altered or adjusted with respect to usability in harsh environments, availability in remote locations, and the likelihood of adverse interactions with overseas medicines. Medical kits may need to be extensive and matched to the needs of the traveler and the situation and should include dental items. They should contain thorough instructions and algorithms for use, contact numbers in case of emergency, and a minimum of prescription medications. Packaging should protect against heat, humidity and cold. It is important that the person using such a kit is thoroughly familiar with its contents and their use. Importation of narcotics, antiretrovirals and syringes may require special permits in some locations.

Food-borne illness: Preparation should include field methods of water purification such as filtration or chemical treatment.

Air-borne illness: These travelers often have prolonged and close contact with the local population and thus more apt to acquire tuberculosis.

Insect-borne disease: Rough living conditions and outdoor exposure increase the likelihood of insect bites both as a discomfort and a disease risk.

Environmental issues: Sun, heat, cold and altitude risks will depend on the destination. Accidental injury and exposure to poisonous plants and animals require more attention than with the usual traveler.

Crime and security: Perhaps most important (and often overlooked) is the matter of personal security. Remote travelers are far from police protection and much more apt to be targeted for crime or kidnapping. Much more helpful than official sources (such as State Department warnings) are safety officers from relief agencies, in-country newspapers, and conversations in person or on line with other travelers. Consultation should specify risk-avoidance measures, contingency plans, and communication. Regular communication links with a home base is essential.
Medical Access: Although medical evacuation is often stressed, it is usually simply not an option in remote locations. In-country medical care needs to be pre-arranged, as does the ability to contact such care by satellite telephone or other means. The skill level of the "medical provider" on the trip should be assessed ahead of time and appropriate arrangements made for any lack in skills. It is a truism in adventure travel that a good medical kit is no substitute for poor planning or lack of judgment.

References:

Helpful web sites:
- For disabled travelers: www.globalaccessnews.com;
- Society for Accessible Travel and Hospitality – www.sath.org;
- www.access-able.com;
- Mobility International USA: www.miusa.org
- Immunocompromised traveler: www.aegis.com/topics/travel.html
- For patients with HIV: -- http://www.aidsnet.ch/immigration/
- The Pregnant Traveler: -- www.pregnanttraveler.com;
- Reproductive toxicology – www.reprotox.org (requires subscription fee)
- Pediatric travel: www.flyingwithkids.com; www.hotelfun4kids.com
- Foreign language handouts for VFRs – www.tropical.umn.edu/TTM/VFR/index.htm
- For a summary of travel to Haj, see: www.fco.gov.uk
- Expatriates: ‘People in Aid’ – www.peopleinaid.org
- Wilderness Medical Society— www.wms.org
6. POST-TRAVEL ASSESSMENT

Steve Toovey, WHO Collaborating Centre for Travel Medicine, Royal Free & University College Medical School, London, United Kingdom, and
Alfons van Gompel, Associate Professor Tropical Medicine, Chief Physician of the Medical Services & Travel Clinic Institute for Tropical Medicine, Antwerp, Belgium

(Declared interest: Steve Toovey has been reimbursed by a number of manufacturers of antimalarials, antivirals, and vaccines for consulting activities and for attending conferences)

Returned travelers may present with symptoms, or be asymptomatic and request screening, and these two situations are best dealt with separately.

Before we begin with the symptomatic traveler, whose needs are more likely to be urgent, let us sound a word of warning: not all illness in returned travelers is travel related. Herein lies the clinician’s challenge: is that fever and muscle ache simply influenza, or could it be early malaria, or even the prodroma of a viral hemorrhagic fever? That of course is why the traveler has come to see the THP, and one of the reasons why travel medicine has become a specialty in its own right. Remember that common things occur commonly, but be prepared for the exotic and the unexpected.

The symptomatic returned traveler should be initially approached with three questions in mind:

1. *Could he have a condition requiring urgent treatment?*
   Conditions requiring urgent treatment include, amongst others, falciparum malaria, meningococcal infection, typhoid, amebic liver abscess, pyoderma with lymphangitis, and septicemic conditions such as meliodosis and the more common gram negative septicemia.

2. *Does he/she pose an infection risk to medical staff?*
   Examples would include the viral hemorrhagic fevers, plague, meningococcal disease, and SARS. The question here is whether isolation and barrier precautions are required, and to what extent.

3. *Is there a risk to the wider community?*
   Examples would include tuberculosis, with multidrug resistant (MDR-TB) and extensively drug resistant (XDR-TB) tuberculosis being especial concerns, and also meningococcal disease. The question here is whether there are public health implications.

The Returned Traveler with Symptoms

What follows is an approach to the returned traveler who may, or who may not have, a travel related condition. This section does not discuss treatments, which are easily looked up elsewhere (see Further Reading), but rather a clinical approach that avoids the pitfalls, and that is likely to result in successful diagnosis.

**History:** Just as in other medical specialty a thorough history is essential. Often, history alone will yield the diagnosis and it needs to be directed to all sections 8.2.1 – 8.2.12

**Demographic profiling** will help you to understand what diseases the traveler may be particularly prone too, and whether he might be at greater risk of serious illness or complications. Here we would think about factors such as age and ethnic background. As an example, typhoid tends to be more common in 'VFR' (visiting friends and relatives) travelers returned from developing countries, and especially those returned from the Indian subcontinent.

**Reason for travel** raises the question of whether travel was for business or leisure, or a combination of the two. For business travelers, it is important to understand exactly what the traveler’s occupation entails, and what he did whilst abroad, e.g. while a field geologist might be a candidate for the diagnosis
of schistosomiasis, and an aid worker for cholera, one would not expect either infection to be an occupational risk for financial executives confining themselves to five star hotels.

A detailed itinerary obtained from the returned traveler will be a particularly valuable diagnostic aid. This itinerary should go beyond a simple listing of countries visited, and should include details of regions, towns, wildlife areas, national parks, and resorts visited. As far as possible, exact dates for each section of the itinerary should be obtained. This will help to refine the list of possible diagnoses. Reference to incubation periods will exclude some conditions and include others: a traveler freshly returned from 4 days in Lagos for example, even if febrile, will not be ill with malaria, always provided of course there was no other earlier exposure.

Activities while traveling may also point to the diagnosis. A category of traveler that requires particular attention is the ‘adventure’ or ‘wilderness’ traveler. Travelers fitting this description may have been exposed to a number of conditions, depending upon the ‘adventures’ they indulged in. Participation in fresh water activities may expose travelers to infectious diseases uncommon in developed countries, e.g. leptospirosis and schistosomiasis. A consideration that follows on from activities while traveling is the degree and type of contact with the local population. The latter is particularly important for infections spread from human to human, e.g. influenza, tuberculosis, meningococcal infection, sexually transmitted infections, and even SARS. Don’t be shy to ask the traveler about sexual activities during his travels: a surprisingly high percentage of travelers indulge in casual sex when away from home.

An additional factor is contact with local animals (both domestic and wild) and plants. Animal contact obviously raises the possibility of various zoonoses, e.g. brucellosis, avian influenza, and rabies, while plant contact may lead to rashes. Travelers should also be asked if they have visited markets where animals, including birds, are sold, and if they have handled or prepared animal, including bird, products.

It may also be helpful to know if travelers have indulged in unwise dietary practices, ones that might lead to unusual infections: one example would be eating uncooked fish.

Accommodation while traveling is important, as a number of diseases are associated with poor or rural accommodation, e.g. South American trypanosomiasis (Chagas disease). Bear in mind though that accommodation in a top hotel in a developing country does not eliminate infectious disease risk: hepatitis A may be transmitted by food handlers in ‘good’ hotels in endemic countries. Overall though, rural accommodation and ‘back packing’ are more likely to put the traveler at greater risk of a good number of travel related conditions.

Previous medical history will help you to determine whether the traveler is at risk of particular infections, or even perhaps immune to some. A history of splenectomy for example should raise alarm bells for rapid progression of malaria, while a history of jaundice in childhood might suggest previous infection with hepatitis A. A question that the clinician should always ask himself is whether the traveler might be immunocompromised, either through disease or medication. Not only might the immunocompromised traveler be more prone to infection and complications, but he might also deceive by exhibiting atypical symptoms and signs.

Current and recently used medication need to be known for a number of reasons. These include the immunosuppressive effect of some medications, possible interactions with proposed treatments, and the ever present possibility that the traveler’s condition might not be travel related but rather an adverse medication effect e.g. a drug rash.

Allergies the traveler is known to have, could be particularly important with regard to adverse effects of proposed treatments.
**Chemoprophylaxis** is most usually prescribed against malaria, but is occasionally considered for other infections, e.g. leptospirosis and influenza. While it is helpful to ask whether the traveler took chemoprophylaxis, reliance should not be placed upon the answer. Firstly, because compliance is frequently imperfect, and secondly, because no chemoprophylaxis is 100% effective. Thus, while a negative answer might prove helpful, a positive one cannot be relied upon.

It is important to know the exact nature of the chemoprophylaxis taken as well, as it would be foolhardy to treat the traveler with the same drug that he had allegedly used for chemoprophylaxis. Additionally, drug interactions between chemoprophylactic drugs and proposed treatments might need consideration, e.g. mefloquine and quinidine.

**Vaccination history** is obviously very useful to know. In this regard it is important to obtain a reliable history, with reference to a vaccination card being of enormous assistance. Very often though, the traveler will not have his vaccination card with him or her, and will be uncertain of the exact vaccinations he/she has received. In situations where an accurate vaccination history can not be established, it is best to assume the worst, and act as if particular vaccinations had not been administered. Very important in this regard is rabies pre-exposure prophylaxis. If you cannot be sure that a complete pre-exposure prophylaxis course was given and there is a history of possible rabies exposure, then administer the full post-exposure prophylaxis regimen.

**Presenting complaints and symptoms**, as in any other branch of medicine, should help to guide you towards a list of possible diagnoses when confronted with a returned traveler. The reader will note that the highlighted ‘presenting complaints and symptoms’ come last on the list. The reason is that a good understanding of the preceding factors will allow you to exclude a good number of diseases, and raise the alarm about others e.g. while a febrile traveler who had visited Kuala Lumpur alone may well have dengue, he is unlikely to have malaria.

Pay particular attention to the presence or history of fever, rigors (shivering), itching, the presence of bites or rashes, alterations in stool and urine appearance, a history of diarrhea or constipation, and neurological signs and symptoms. Fever in returned travelers usually signifies infection, although it may occasionally be associated with non-infectious causes, e.g. deep vein thrombosis and embolism.

Two *red flag* reminders are appropriate here. The first is that any potential case of falciparum malaria is a medical emergency. The second concerns the universally fatal nature of rabies, and its possible prolonged incubation. These mean that all possible rabies exposures, no matter how long after the offending bite or lick, should be urgently considered for post exposure prophylaxis.

**Red Flag Reminder 1**

**DON’T DELAY CONDITIONS**
- Falciparum malaria is a medical emergency. All cases of fever in returning travelers should be regarded as malaria until proven otherwise.
- Meningococcal infection, typhoid, amebic liver abscess, and septicemic conditions also deserve immediate attention
- Potential rabies exposures require urgent management. If in doubt about whether pre-exposure prophylaxis was given, assume that it was not and administer full dose post-exposure prophylaxis

**Red Flag Reminder 1**

**FEVER**
- Fever may come and go, and its absence during examination might not mean that the patient does not have a febrile illness.
- The classical fever patterns described for malaria are rarely observed in practice
Examination
Clinical examination of the returned traveler will often fail to reveal any specific clinic signs or findings. Nevertheless, a thorough clinical examination should be conducted: travelers returned from southern Africa and suffering from African tick bite fever might not notice or report the presence of a ‘typhus node’ or ‘tache noir’, yet one of the authors recalls diagnosing African tick bite fever after finding a tick in a febrile patient’s external ear canal.

Make a point of looking for skin lesions which might indicate bites, or the evolution of a rash. Make a point of listening carefully for abnormalities in the lungs, which may be quite subtle; look also for swollen lymph glands, and enlarged livers and spleens. Any neurological abnormality or suggestion of mental sluggishness should ring alarm bells.

Although much has been made of specific fever patterns in malaria, these are infrequently observed in clinical practice. The important point is that fever may come and go, and may be absent during examination.

Investigation
There is unfortunately no substitute for clinical judgment, and it is not possible to give a definitive investigation list applicable to all returned travelers. Nevertheless, common sense, and the fact that many travel related conditions have non-specific presentations make it prudent to include basic investigations in most consultations:

Complete (full) blood count: This should include a platelet count, as abnormally low platelet counts are seen in a number of conditions, including falciparum malaria and dengue fever. A raised eosinophil count may point to an invasive parasitic condition. Important to remember though is that a normal eosinophil count will not always exclude parasitic infection. Normal white cell counts are seen in malaria and even at times typhoid fever.

Malaria smears: Ideally, both thick and thin smears should be examined by a skilled microscopist. Such skills are in short supply however, and in many situations laboratories may usefully conduct additional tests to look for malaria parasites e.g. quantitative buffy coat, immunoflourescence and polymerase chain reaction. Remember that a negative test does not entirely rule malaria out. Repeat the tests every 8-12 hours until the diagnosis of malaria is confirmed, or confidently excluded. Remember too that testing should not be delayed until the fever is present, as parasites remain visible in the blood between fever bouts.

Malaria rapid antigen testing: These tests have come a long way, with some offering diagnostic reliability approaching that of skilled microscopists. In situations where reliable laboratory services are available, as in most developed countries, these tests should not be a substitute for laboratory based diagnosis, but rather a very useful adjunct. Essentially, a positive test will tell the clinician straight away that malaria is present, while a negative test will not exclude the diagnosis. All rapid antigen tests look for the presence of falciparum malaria, while some also look for other malaria species. These tests do not provide information on parasite density, which is important in classifying malaria as ‘complicated’ or ‘uncomplicated’. Importantly, once these tests have turned positive, many remain so for two weeks or more and cannot be relied upon to show either cure or recrudescence (rebound disease).

Liver function tests: These form part of most baseline medical investigations, and are useful in many travel related conditions. It is helpful to include lactate dehydrogenase (LDH), as both damaged livers and red blood cells release this enzyme.

Urea and electrolytes and creatinine: An assessment of electrolyte status and kidney function are useful baseline investigations, and will prove helpful in helping to determine whether many diseases are complicated or not.

Urinalysis: Routine urinalysis should be undertaken in all cases, and can yield a great deal of useful information. Useful urine dipstick tests include: glucose, ketones, red blood cells, white blood cells, nitrite, urobilinogen, bilirubin, and protein.
**Stool and urine microscopy and culture:** Where gastrointestinal or urinary tract infections are suspected, culture and microscopy of fresh samples should be undertaken.

**Blood cultures:** These should be taken if antibiotic therapy is to be initiated on an empirical basis for a febrile illness, i.e. without a clear diagnosis having been made. Blood cultures too should not be delayed until fever is present, as bacteraemia is detectable even when afebrile.

**Specific diseases**
A number of the commoner travel related infections deserve mention, each with its own management pitfalls. The diagnosis of these infections mostly depends upon a good history and clinical suspicion, and should fall within the scope of most primary care services. Referral may be indicated for further management, or for diagnosis of the less common travel related infections.

**Malaria:** The biggest trap awaiting the unwary clinician is falciparum malaria. Any traveler with fever or flu like symptoms returned from a malaria area should be regarded as having falciparum malaria until proven otherwise, and managed as a medical emergency. Negative smears and blood tests do not entirely exclude the disease, and should be repeated every 8 to 12 hours until a firm alternative diagnosis is made. Although most falciparum malaria cases will present in non-immunes within three months of infection, i.e. of being bitten, a very small percentage will present as late as six or even twelve months or longer, especially in partially immune individuals.

Important in the management of malaria is to understand whether falciparum malaria is complicated or uncomplicated. The criteria for complicated malaria are listed in table 1. Complicated malaria will require expert management, but even uncomplicated malaria will benefit from hospitalization in a developed country setting.

<table>
<thead>
<tr>
<th>Table 1. Signs of complicated malaria.</th>
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</thead>
<tbody>
<tr>
<td>The presence of any of the following indicates complicated malaria:</td>
</tr>
<tr>
<td>• A decreased Glasgow coma score. Any decrease in level of consciousness, confusion, or drowsiness.</td>
</tr>
<tr>
<td>• Generalized and repeated convulsions</td>
</tr>
<tr>
<td>• Significant anemia. Hb &lt;10g/dL</td>
</tr>
<tr>
<td>• Hypoglycemia</td>
</tr>
<tr>
<td>• Metabolic acidosis with respiratory distress</td>
</tr>
<tr>
<td>• Fluid and electrolyte disturbances</td>
</tr>
<tr>
<td>• Acute renal failure or poor urine output</td>
</tr>
<tr>
<td>• Pulmonary edema</td>
</tr>
<tr>
<td>• Acute respiratory distress syndrome</td>
</tr>
<tr>
<td>• Circulatory collapse/shock</td>
</tr>
<tr>
<td>• Evidence of septicaemia</td>
</tr>
<tr>
<td>• Abnormal bleeding*</td>
</tr>
<tr>
<td>• Jaundice or elevated aminotransferase levels</td>
</tr>
<tr>
<td>• Hemoglobinuria</td>
</tr>
<tr>
<td>• Fever &gt;39ºC</td>
</tr>
<tr>
<td>• Parasitemia ≥5%</td>
</tr>
</tbody>
</table>

*A low platelet count is usual with malaria and is not itself a sign of complicated disease.*

**Schistosomiasis:** This infection may present quite dramatically, as acute schistosomiasis (Katayama fever). Alternatively, it may present with either very few, or no symptoms. Acute schistosomiasis usually presents between 3 to 12 weeks after initial infection, with fever, and body aches. Bronchospasm is often
but not invariably present. Abdominal pain and urticaria may be present. An eosinophil count in excess of 1000 cells/mL can be expected.

In the absence of an acute schistosomiasis syndrome, the clinician may need to actively look for schistosomiasis. Serology is diagnostic following first exposures, but it may take up to 3 months before it becomes positive, and once positive it may remain so for life. Examination of stool and urine for ova will be indicated, as may the taking of rectal snips to confirm the diagnosis. Eosinophilia is not always present in non-acute schistosomiasis.

Dengue: This is generally a clinical diagnosis based upon symptoms and a history of exposure. The incubation period of this mosquito borne viral infection is typically between 3 and 10 days. Symptoms include fever, severe body and joint pains, and headache. A generalized macular rash is seen in approximately half of all victims. Most often the infection clears within a week without complications, but clinicians should be on the alert for the very small percentage (at most 1%) who develop dengue hemorrhagic fever and dengue shock syndrome. These complications are invariably preceded by a low platelet count. Serology is not usually helpful in the diagnosis of dengue during the acute stage of the illness. Low white cell counts are common. Rapid Antigen detection tests are not routinely available, and may also lack sensitivity.

Rickettsial spotted fevers: The various rickettsial species are widely distributed. Frequently they are seen in travelers returned from Africa and the Mediterranean where they are usually tick transmitted. Rickettsial infections may be contracted elsewhere, when other vectors may be involved. Despite the ‘spotted fever’ name, not all rickettsial infections result in a rash. Clinicians should look for a ‘typhus node’ or ‘tache noir’. This is the mark of the original infecting bite, which may be inflamed and covered with a black ‘eschar’. It is not invariably present. Diagnosis is usually clinical, with serology not being helpful during the acute stages.

Diagnostic databases and web sites
A number of useful databases and web sites are available to assist with diagnosis. ‘Gideon’ is a comprehensive database available by subscription only. Its costs probably make it more appropriate for practitioners and clinics that see large numbers of returned travelers (see Further Reading).

The University of Lausanne in Switzerland maintains a useful site with open access. This assists with the evaluation of returned travelers with fever (see Further Reading).

Screening the asymptomatic traveler
It is not uncommon for returned travelers to present for ‘screening’, for the diagnosis and eradication of latent, asymptomatic, or minimally symptomatic infections. Screening is often undertaken for returned expatriates and long term travelers. Once again, the screening process should be guided by a detailed history and understanding of the risks a traveler will have been exposed to. A clinical examination should be undertaken, although it is often unrewarding. The principal decision the clinician has to make is “Which tests should I conduct?”

This process will obviously be directed by the relevant incubation periods and geographical exposure, but a useful guide to screening is presented in table 2. Scrutiny of table 2 and consideration of incubation periods will show that more than one screening consultation may be appropriate.

Table 2. A practical guide to incubation periods in the asymptomatic returned traveler

<table>
<thead>
<tr>
<th>DISEASE</th>
<th>INCUBATION PERIOD</th>
<th>TIME LAPSE AFTER WHICH ASYMPTOMATIC INFECTION BECOMES VERY UNLIKELY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>Incubation Period</td>
<td>Clinical Course</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Amebiasis</td>
<td>1 day – 6 months</td>
<td>6 months – but may be much longer, even years</td>
</tr>
<tr>
<td>Filariasis (<em>W. bancrofti</em>)</td>
<td>?-&gt;1 year</td>
<td>2 years</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>1-6 months</td>
<td>6 months</td>
</tr>
<tr>
<td>Hepatitis C</td>
<td>2 weeks -6 months</td>
<td>6 months</td>
</tr>
<tr>
<td>HIV</td>
<td>14-&gt;90 days</td>
<td>3-6 months</td>
</tr>
<tr>
<td>Intestinal worms</td>
<td>21-&gt;60 days</td>
<td>2 months</td>
</tr>
<tr>
<td>Loiasis</td>
<td>?-&gt;1 year</td>
<td>2 years</td>
</tr>
<tr>
<td>Malaria (<em>P. falciparum</em>)</td>
<td>9-35 days</td>
<td>Non-immunes: 3 months</td>
</tr>
<tr>
<td>Malaria (<em>P. malariae</em>)</td>
<td>10 days - &gt;1 year</td>
<td>&gt;10 years</td>
</tr>
<tr>
<td>Malaria (<em>P. ovale; P.vivax</em>)</td>
<td>10 days - &gt;1 year</td>
<td>2-4 years</td>
</tr>
<tr>
<td>Onchocerciasis</td>
<td>3-&gt;15 months</td>
<td>2 years</td>
</tr>
<tr>
<td>Schistosomiasis</td>
<td>21-&gt;60 days</td>
<td>6 months, but occasionally longer</td>
</tr>
<tr>
<td>Strongyloidosis</td>
<td>7-&gt;21 days</td>
<td>1 month to years later</td>
</tr>
<tr>
<td>Syphilis</td>
<td>9-&gt;90 days</td>
<td>3 months</td>
</tr>
<tr>
<td><em>Trypanosoma brucei gambiense</em></td>
<td>A few weeks to months or even years</td>
<td>Several months or even years</td>
</tr>
<tr>
<td><em>Trypanosoma cruzi</em> (Chagas disease)</td>
<td>5-14 days</td>
<td>Follow up for 6 months after possible exposure</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>&gt;30 days</td>
<td>2-4 months, but may remain infected lifelong</td>
</tr>
<tr>
<td>Typhoid</td>
<td>7-45 days</td>
<td>2 months</td>
</tr>
<tr>
<td>Visceral leishmaniasis</td>
<td>2-6 months</td>
<td>Several months or even years</td>
</tr>
</tbody>
</table>


**Summary**

The clinician should remember that not all illness in travelers is necessarily travel related. First and foremost however, management of the returned traveler requires a grasp of his risk profile, based upon both personal factors and itinerary. The clinician should aim to exclude conditions that may require urgent attention, and then broaden his/her list of possible diagnoses to other less immediately threatening conditions. As always, a good history is likely to be the cornerstone of diagnosis.

**References:**


A “Travel Clinic” is a loose description for a medical facility that offers a range of health care services aimed at the travelling public. Clinics may be independent or incorporated within general practice surgeries or hospital out-patient departments. Many are nurse led; others are staffed by pharmacists, general practitioners or specialist travel health practitioners. While most clinics are situated in the traveler’s country of origin, a small number are in destination countries. Destination travel clinics usually offer highly specialized services and expertise relevant to the needs of travelers within the country as well as providing “pre-travel” advice for patients travelling onwards to other destinations.

Meeting the variable and unpredictable needs of the travelling public is impossible without some external assistance and indeed the use of external services may provide a valuable source of extra income for the travel clinic. The provision of the basic core services will at some point require the use of a referral agency even though the role of the travel clinic may have a narrow focus.

Pre-Travel
The pre-travel consultation is a ‘risk assessment’ that considers a complex blend of variables relating to the traveler, the nature and purpose of travel and the destination country or countries. The pre-travel risk assessment is often the first time that an individual’s vaccine history and record of previous infectious disease is scrutinized and very often reveals enough doubt about immune status that investigation of immunity is considered or required.

Laboratories: With the exception of skin testing or the presence of a BCG scar, immunity is checked by the detection of circulating antibody. Serological testing is not a complete measure of immunity to infection but it is the only practical measure available. In the travel clinic setting, serology is used either to check immunity from exposure to natural infection or to check the response to vaccination. Quantifiable detection of circulating antibody performed to a high degree of accuracy requires specialist laboratory facilities and access to such a facility is essential in establishing a traveler’s immuno-susceptibility to infection. Although evidence of exposure to any infectious agent can be established through serological testing, travel clinics will commonly restrict requests to more commonly required investigations (Table 1)

Table 1: Commonly requested pre-travel serological tests

<table>
<thead>
<tr>
<th>Test</th>
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<tbody>
<tr>
<td>Hepatitis B</td>
</tr>
<tr>
<td>Hepatitis C</td>
</tr>
<tr>
<td>Varicella</td>
</tr>
<tr>
<td>Measles</td>
</tr>
<tr>
<td>Mumps</td>
</tr>
<tr>
<td>Rubella</td>
</tr>
<tr>
<td>HIV 1 and 2</td>
</tr>
<tr>
<td>Rabies</td>
</tr>
</tbody>
</table>

Hepatitis B: Serology for Hepatitis B is perhaps the most commonly required serological test largely due to the problem non-responders. Additionally travel clinics frequently use the less immunogenic accelerated vaccination schedule, as the standard schedule over six months is not practical for most travelers. As a result it is now standard practice to check the serological response of all travelers receiving a hepatitis B vaccine series. This is particularly important for travelers at high risk such as health care workers and for those requiring evidence of seroconversion before travel.

Childhood infections: Serology is useful in establishing immunity to common childhood illnesses especially in older patients who have unreliable vaccine recall and may have avoided natural infection. Childhood infections can be particularly unpleasant in adulthood and travel to the developing world often
takes individuals out of the “herd immune” environment that will have protected them up to the point of departure. Serology is often less expensive than vaccination and can also be used as a cheaper alternative to empirical vaccination when there is some doubt surrounding the history of previous infection. Measles, Mumps, Varicella and Rubella are the diseases for which serology is most commonly used; evidence of varicella immunity is required for consideration of employment of health professional such as those signing up to nursing agencies or working in care homes for the elderly.

HIV: There is no vaccine available against HIV infection and serology is used as part of sexual health screening or to test for evidence of immunity for visa applications. It is also used in the post travel setting dealt with in the next section.

Rabies: Rabies serology is less commonly requested but is an important investigation in certain settings. As a disease with a case fatality rate of 100% preventing infection is critical. Unlike other diseases, the time of infection is usually known except in rare cases of non-bite rabies where infection is acquired via licks to open wounds or mucosal membranes. As a result it is possible to effectively vaccinate after exposure to the disease. Responses to rabies vaccination are predictably excellent except in certain well documented situations such as concomitant intra-dermal rabies vaccine while taking chloroquine so routine checking of serological responses is not required. However if the possibility of occult exposure exists then it is important to check rabies serology to ensure that protective levels are achieved and maintained. This is particularly so of animal handlers and those at risk of occupational exposure who may also be knowingly repeatedly exposed. If sero-protective levels are documented then repeated post-exposure vaccination is not necessary. The other group to consider is young children re-locating to areas where rabies is highly endemic in the domestic dog population such as South and Southeast Asia. Young children are at risk of non-bite exposure such as licks to the mouth and eyes. In such cases opportunities for post-exposure prophylaxis will not be realized and serological testing and targeted boosting is an alternative to regular blind boosting.

Non-travel testing: As travel clinics develop expertise in the handling and administration of vaccines and related products, it is common for them to receive requests for non-travel related advice. Agencies for healthcare workers taking on predominantly immigrant staff will require them to be screened for a range of infectious disease before they can be employed in hospitals and nursing homes. This work is often sourced out to travel clinics that can only take it on if they have access to the appropriate serological testing.

Non-serological laboratory investigations (Table 2): Laboratory services may also be required to establish a traveler’s fitness to fly and fitness to undertake the proposed itinerary or activity at the destination country. The pre-travel consultation may also be an opportunity to screen long term travelers or those relocating to another country; one of the commonest causes of death in travelers is pre-existing cardiovascular disease and the pre-travel consultation is an important opportunity to establish a long-term traveler’s cardiovascular risk and exclude conditions such as diabetes. Severe anemia is a contra-indication to commercial air travel and thrombophilia screening may identify those at greater risk of Deep Vein Thrombosis (DVT) during long haul flights. Pregnancy testing is another consideration for travelers going to very remote locations or high risk destinations such as extreme altitude.

Table 2: Non-serological pre-travel laboratory investigations

<table>
<thead>
<tr>
<th>Laboratory Investigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemoglobin</td>
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<tr>
<td>Blood glucose</td>
</tr>
<tr>
<td>Fasting Lipids</td>
</tr>
<tr>
<td>Thrombophilia screen</td>
</tr>
<tr>
<td>Thyroid function</td>
</tr>
<tr>
<td>Beta HCG</td>
</tr>
</tbody>
</table>

Radiology services: Pre-travel assessment rarely requires radiology facilities. Patients with chronic airways disease should be expertly assessed prior to air travel and assessment will usually require a recent chest X-ray. Bullous lung disease and unresolved pneumothorax are contra-indications to flying and if the
diagnosis is suspected then chest X-ray or spiral CT will be required. Pre-travel assessment for scuba divers does not routinely require chest radiography if there are no relevant findings in the history or physical examination. Visa requirements for travelers re-locating or emigrating will often depend upon the production of a normal chest x-ray report.

Extended or remote travel may necessitate more extensive pre-travel screening and referral for mammography may be indicated.

**Referral for specialist opinion:** The pre-travel consultation is used to identify the risk involved in any proposed trip and help the traveler manage this risk, even if it means cancellation. Assessing the risk to an individual traveler may mean requesting more than one specialist opinion and it is the travel health practitioner’s responsibility to coordinate this process and advise the traveler accordingly.

International travel is not the preserve of young, fit individuals and plenty of elderly and disabled are enthusiastic travelers. Assessing the risk of travel is sometimes complicated and specialist knowledge is required to properly advise the travelers. Table 3 lists some of the more frequent dilemmas that arise in the course of pre-travel consultations and where expert specialist opinions are frequently requested. It is important to remember that the advice is a blend of expertise viz: the respiratory physician may understand the effects of altitude on a patient’s airway disease but may not appreciate the poor health infrastructure or remote setting to which the patient is intending to travel or be aware of the fact that the ‘only way to reach the climb is via a very dusty road whilst staying in smoke filled lodges’. Patients undergoing treatment for mental health illnesses present a particularly interesting dilemma when presenting for pre-travel advice. Medication may not be available overseas, malaria chemo-prophylaxis may be contra-indicated, jet lag and unfamiliar cultural practices may all conspire to exacerbate mental illness and the risk of travel needs to be carefully assessed by mental health professionals.

**Table 3: Common travel dilemmas requiring specialist opinion**

<table>
<thead>
<tr>
<th>Vaccines:</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Elderly</td>
</tr>
<tr>
<td>* Cancer treatment</td>
</tr>
<tr>
<td>* HIV infection</td>
</tr>
<tr>
<td>* Immunosuppressants</td>
</tr>
<tr>
<td>* Pregnancy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Concomitant illness:</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Fitness to fly</td>
</tr>
<tr>
<td>* Effect of traveler’s diarrhea</td>
</tr>
<tr>
<td>* Travel and mental health</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Altitude:</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Cardiovascular disease</td>
</tr>
<tr>
<td>* Epilepsy/Previous SAH</td>
</tr>
<tr>
<td>* Pregnancy</td>
</tr>
<tr>
<td>* Poor liver or renal function</td>
</tr>
<tr>
<td>* Respiratory disease/asthma</td>
</tr>
</tbody>
</table>

**Pre-travel screening (Table 4):** Travelers embarking on remote or long term travel should consider having more extensive pre-travel assessment addressing cardiovascular health, cervical and breast screening, respiratory health and screening for problems that may present in a country that has poor health infrastructure. Dental problems presenting during travel are rarely life threatening but can cause pain and misery to the affected traveler. A thorough dental screen is advisable for all but the briefest of trips and referral to a dentist should be mandatory for long term or remote travelers.
### Table 4: Pre-travel screening investigations

<table>
<thead>
<tr>
<th>Completion of vaccine schedules</th>
<th>Medication supplies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac assessment including stress testing</td>
<td>Routine labwork (INR, TSH/T4, Renal function)</td>
</tr>
<tr>
<td>Spirometry and saturation monitoring</td>
<td>Expert risk assessment e.g. malaria risk, altitude.</td>
</tr>
<tr>
<td>Cervical smear</td>
<td>Point of contact for emergency treatment and medical evacuation</td>
</tr>
<tr>
<td>Mammography</td>
<td></td>
</tr>
<tr>
<td>Fecal occult blood or colonoscopy</td>
<td></td>
</tr>
<tr>
<td>Dental assessment</td>
<td></td>
</tr>
</tbody>
</table>

### Referral to destination clinics

Specialist opinion may also be sought at the destination country prior to travel. Table 5 outlines common reasons for referring someone to a destination clinic and arming travelers with this information prior to travel is immensely reassuring and offers continuity of care that transcends international boundaries and geographical separation. The International Society of Travel medicine (ISTM) website lists travel clinics run by members and indicates where those members have gained the certificate in travel medicine, one of the few post-graduate qualifications in the field of travel health. Giving travelers a point of contact in their destination country staffed by practitioners who meet minimum standards of practice set by a recognised panel of experts provides an excellent safety net for vulnerable patients.

### Table 5: Reasons for onward referral to destination travel clinics

<table>
<thead>
<tr>
<th>Referral to other support services:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Insurance cover</strong> - Preparing individuals for higher risk activities includes onward referral for appropriate insurance that covers evacuation to a place of safety and rapid access to a suitable level of medical care. Some sports use specialist insurance companies via advisory bodies. The divers alert network DAN offers worldwide evacuation insurance at reasonable cost that covers evacuation and recompression treatment in the nearest hyperbaric chamber. Trips to high altitude, white water rafting and travel to remote destinations are other examples of high risk activities that would require specialist cover that includes evacuation.</td>
</tr>
<tr>
<td><strong>Provision of blood products</strong> - At least one company offers its members a service of blood provision worldwide in the event of an accident. Registered travelers submit a blood specimen which is stored and if blood is then required at a later date it can be cross-matched and dispatched. A similar service is offered for the provision of HRIG in rabies endemic areas where supplies are limited or not available.</td>
</tr>
<tr>
<td><strong>Dental care</strong> - Dental assessment and necessary treatment prior to travel is important for several reasons. Dental symptoms can be protracted and ruin trips, particularly to remote areas where care may not be available. Dental treatment in countries with a high prevalence of seropositivity to blood borne viruses constitutes a significant risk of infection, particularly if equipment is reused or not adequately sterilised. All travelers embarking on remote or prolonged trips should be strongly encouraged to see to any outstanding dental problems prior to travel.</td>
</tr>
</tbody>
</table>
**Post-Travel**

Whereas the pre-travel consultation is focused on risk assessment, the post-travel consultation aims to address symptoms that may be related to travel or to screen an asymptomatic patient for exposure to a pathogen for which treatment may avert clinical illness. The emphasis of post travel consultations is therefore on diagnosis of disease and laboratory services play an essential part in this process.

**Laboratory services for the returning traveler:**

- **Fever:** Fever in the returning traveler requires prompt and expert investigation and should not be undertaken by travel clinics that do not have rapid access to the necessary investigations. The causes of post-travel fever are many and range from trivial to life threatening - excluding *falciparum* malaria is essential in any febrile traveler returning from endemic countries and must be done as soon as possible after presentation. *Falciparum* malaria infection is a medical emergency and the laboratory service must be timely in relaying the results. If this is not possible the patient should be immediately referred onwards for assessment.

- **Diarrhea:** Persistent diarrhea following travel is either due to persistent infection Stool microscopy and culture is essential for assessing patients with post-travel diarrhea and should include identification of Clostridium toxin.

- **Traveler’s thrombosis:** Another frequent post-travel complaint is unilateral leg swelling which will require investigation into the possibility of a travel related deep vein thrombosis (DVT). D-dimer testing is used by many UK hospitals as a screening procedure prior to more invasive investigation such as venography but results should be interpreted with caution, as both false positive and false negative results are possible.

- **Post travel screening (Table 6):** screening following travel may be prudent for certain travelers. Some targeting of screening tests will be necessary as the possible list is long but should include laboratory assays for blood-borne viruses and HIV viral load, screening for eosinophilia and where indicated, schistosomiasis serology. Post-travel screening for TB may also be achieved using Quantiferon gold tests. Travelers exposed to ticks during travel in temperate climates may request screening for *Borelia burgdorfi* antibodies (Lyme disease). Some clinics are involved in post deployment medical screening and unusual requests may have to be accommodated, such as urine assays to test for the presence of depleted uranium in journalists returning from the Gulf during the last war.

**Table 6: Post travel screening tests**

<table>
<thead>
<tr>
<th>Serology:</th>
<th>Amoebiasis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Schistosomiasis</td>
</tr>
<tr>
<td></td>
<td>Hepatitis A/B/C</td>
</tr>
<tr>
<td></td>
<td>HIV 1 and 2</td>
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<tr>
<td></td>
<td>Filarisis</td>
</tr>
<tr>
<td></td>
<td>Syphilis</td>
</tr>
<tr>
<td></td>
<td>Lyme disease</td>
</tr>
<tr>
<td>Haematology including eosinophil count</td>
<td></td>
</tr>
<tr>
<td>Blood chemistry</td>
<td></td>
</tr>
<tr>
<td>Stool analysis</td>
<td></td>
</tr>
<tr>
<td>Urinalysis</td>
<td></td>
</tr>
<tr>
<td>TB testing (PPD or Quantiferon gold)</td>
<td></td>
</tr>
</tbody>
</table>

- **Post travel radiology referral:** Fever, respiratory complaints and persistent or new onset diarrhea in returning travelers may at some point require radiological investigation. Much of this can be performed in an outpatient setting before onward referral is necessary. Fever with respiratory signs will usually require a chest x-ray, particularly if a lower respiratory tract infection is suspected. Suspected exposure to tuberculosis would only require a chest radiograph.
if clinical disease is expected although in reality it is a commonly requested investigation if latent TB is suspected on tuberculin testing. Abdominal ultrasound is another useful investigation for assessing travelers presenting with fever or persistent diarrhea. Hepatic liver abscesses may be pyogenic or amoebic in origin and are a cause of unexplained fever in travelers. Occasionally substantial liver abscesses are missed on ultrasound and require further investigation using Computerized Tomography (CT) or magnetic resonance imaging (MRI) scanning. CT or MRI scanning of the head may be useful during the investigation of febrile travelers with neurological signs or evidence of central nervous system involvement but this would be unlikely to be performed without first admitting the patient into hospital.

• **Investigation DVT:** Ultrasonography may also be used in the investigation of suspected travel related deep vein thrombosis. Clinically suspicious cases may be referred based on d-dimer testing for compression ultrasound scans or venography and travel clinics that see post travel patients should be able to access these investigations and refer onwards for further management any patients with a proven DVT.

• **Post travel specialist referral:** Returning travelers need access to a range of specialist care, many already mentioned. Sick travelers returning for whom *falciparum* malaria needs excluding should be considered as medical emergencies and treated in an appropriate centre. Access to a competent infectious disease hospital is essential for onward referral of travelers either as inpatients or outpatients for the work up of fever, eosinophilia and persistent diarrhea.

Persistent diarrhea is a frequent post-travel complaint and require specialist assessment if a diagnosis remains elusive after simple outpatient investigations such as stool analysis. Post infectious malabsorption (Sprue) and non-infectious colitis or malignancy may present as post travel complaints and diagnosis is usually available after specialist investigation including endoscopy. Skin problems are another common presenting complaint in travelers and access to an expert opinion either directly or via a web link for uploading digital images is extremely useful.

• **Psychological referral:** Travel clinics seeing post travel patients may be called upon to deal with travel associated psychiatric illness. Acutely psychotic patients are usually stabilized and evacuated but returning travelers may experience depression or post-traumatic symptoms following travel, particularly if work related such as war reporters and journalists deployed in disaster zones. Specialist psychiatric services are an invaluable resource for travel clinics who are involved in corporate work that involves travel to dangerous areas.

Expert opinions are not just confined to hospitals or clinics, many facilities operate call centres, there may be national advice centres available by phone or via the internet, e-mail lists such as the ISTM listserv allow a tremendous amount of international expertise to be tapped extremely quickly.

**Destination Travel Clinics**

Travel clinics in destination countries occupy a unique position. By targeting foreign travelers they not only provide a source of information and care on health issues specific to the host country, but inevitably the clinic becomes a conduit for acutely sick travelers who need evacuation or repatriation. Destination clinics are also seen as a place of safety for sick travelers, a place where foreigners in a strange land will have the cultural and language barriers reduced to manageable levels and where the practitioners, because of their international background, are able to act as advocates for patients while providing the highest possible quality of care. It is not that individual practitioners in travel clinics are better trained or more skilled than their local colleagues, but they are perhaps better connected internationally in ways that most local practitioners would find impossible. Perhaps the most important factor that determines the success of a destination clinic is its ability to plug into available local and international health services. Establishing a network of trusted services that are happy to send and receive referrals is an essential early step for newly established destination travel clinics.
The following case illustrates the importance of support services to a destination clinic situated in Nepal: *A 69-year-old retired British Royal Marine presented to a travel clinic in Kathmandu having been evacuated from a mountain rescue clinic by helicopter the same morning. On his arrival he was cyanosed and hemodynamically shocked and an urgent chest x-ray was ordered from a nearby radiology centre. This showed a hydropneumothorax and he was transferred urgently to a local hospital where a chest drain was inserted. When his stomach contents drained from the tube he was transferred to the main teaching hospital and underwent surgical repair of his ruptured esophagus. Three days later he was transferred to Singapore where he required a total esophagectomy after the original surgical repair broke down.*

Boerhaave’s syndrome carries a very high mortality even when treated in health systems of the highest quality and the time from rupture to surgery is the most important prognostic indicator. This case illustrates the importance of the referral network centered on a destination travel clinic even though the clinic had only a minor clinical role to play in receiving, resuscitating and investigating this patient before his immediate onward referral. The more significant role of the clinic was as an advocate for the patient from the time of his arrival to his eventual repatriation, as a coordinator of his further care and negotiator with the medical rescue and insurance companies. This is only possible by having access to an established referral network of logistics, technology and expertise, a network that needs constant nurture and appraisal to guarantee its function when required.

Destination clinics also require communication with local political and academic institutions and international health agencies to ensure that knowledge is current (i.e. local outbreaks) and that practice is consistent with local laws and regulations. (see table 7).

Table 7: Additional referral agencies for destination clinics

| In-country evacuation and retrieval services |
| Regional specialist care/tertiary referral |
| Local government and health ministry staff |
| International and local research centres |
| International health agencies (WHO, UN offices) |

**Liability:** Travel clinics using referral agencies as advice sources, technical assistance or specialist opinion must make it clear on where each agency’s responsibility lies and who accepts liability for any opinion or work carried out. Referring patients to a support service may carry with it full or partial liability for problems that occur as a result of the referral and clinics need to establish any liability and insure adequately against it.

**Conclusion**

Travel clinics are unable to operate in isolation. The unpredictable nature of travelers as patients and the almost infinite permutations of traveler and journey mean that onward referral is bound to be required. Newly opening travel clinics would do well to integrate early with local specialists and have a clear idea of where local facilities are available. The travel clinic can only be as good as the referral agencies it uses and as a result this important relationship must be cherished and constantly reviewed to ensure efficient, safe service of the best quality.

**References:**

8. CLINIC SURVEYS  
Marc Shaw Associate Professor and Medical Director, WORLDWISE Travelers Health Centres, NZ

As part of clinic’s ongoing audit, annual reviews of a clinic’s services are advised. Such surveys can be simple and easy to carry out, or can be quite complex. The simpler ones are most appreciated by staff and traveler, and the easiest to conduct and analyse. Whilst there will be interest in WHERE travelers are going and HOW LONG they are going for, this information would normally be retained on computer. From an audit point of view, TRAVELER ACCEPTABILITY, SOURCE OF REFERRAL, and HOW TO IMPROVE SERVICES OFFERED are most important, and need to be assessed regularly to monitor, revise and update services offered from the clinic.

A typical simple ‘sample questionnaire’ in enclosed (APPENDIX BELOW). This can be done at the clinic, or by mail out. Both have advantages and disadvantages, e.g. the former may show bias towards the clinic with a natural inclination of the travelers to please the clinic staff, the latter would cover this as it is ‘blind’ but retrieval of the survey information would be a big issue etc. Nevertheless, from such surveys three factors will guide a clinic’s services to evolve, improve and develop:
   i) good staff morale and communication
   ii) an ability to respond to, and adapt to, change
   iii) good information source back-up

APPENDIX: CLINIC QUESTIONNAIRE

<table>
<thead>
<tr>
<th>NAME AND BRANDING OF CLINIC</th>
<th>Address of the clinic</th>
</tr>
</thead>
</table>

| Research QUESTIONNAIRE | Date... |

1. **Age group: ( please circle appropriate box )**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-9 years</td>
<td>10-19 yrs</td>
<td>20-29 yrs</td>
<td>30-39 yrs</td>
<td>40-49 yrs</td>
<td>50-59 yrs</td>
<td>60-69 yrs</td>
<td>70 plus</td>
</tr>
</tbody>
</table>

2. **Sex: (please circle as appropriate)**

| Male | Female |

3. **Are you going overseas for: ( please circle appropriate box )**

<table>
<thead>
<tr>
<th>Business</th>
<th>Vacation</th>
<th>Both</th>
<th>Humanitarian/military</th>
<th>Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

4. **Duration of Travel: ( please circle appropriate box )**

<table>
<thead>
<tr>
<th>&lt; 1 month</th>
<th>1-3 months</th>
<th>3-6 months</th>
<th>6-12 months</th>
<th>indefinitely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

5. **Where are you going to? ( please circle appropriate box )**

| South East Asia, Thailand, China | Africa; north, south or sub-Saharan |
| Central America | North America |
| South America | Pacific Region |
| Europe | Russia and former Russian Federation |
| India, Pakistan, Sri Lanka, Afghanistan | Middle East, Arabia, Israel |

6. **Referral Agency: ( please circle appropriate box )**

<table>
<thead>
<tr>
<th>Travel Agent</th>
<th>General Practice</th>
<th>Health agency</th>
<th>Friend</th>
<th>Publicity</th>
</tr>
</thead>
</table>
7. **Initial Contact with the Clinic.** We feel that your initial contact with us is important. Did you find our staff approachable and considerate when you first contacted us? YES / NO

Any other comment, or advice?

8. **Medical and Nursing Consultation Time.** We feel that your consultation could take up to an hour. Did you get what you consider to be an appropriate time for your consultation? YES / NO

Any other comment, or advice?

9. **Confidence.** Do you feel confident about managing your travel health as a result of the consultation today? Please answer on a scale of 1-5, 1 being very bad and 5 being excellent. Answer: 1-2-3-4-5

Any other comment, or advice?

10. **Do you have any other comment on our Time-Management?**

Please comment:

11. **Do you have any other comment on our Clinic Services, or what you would like to see at our Clinic in the future?**

Please comment:

THANK YOU FOR YOUR TIME AND HELP IN THIS SURVEY, WHICH IS BEING DONE TO AUDIT THIS CLINIC