

CHAPTER 1

Approach to Travel Medicine and a Personal Travel Medicine Kit

Elaine C. Jong

A new medical specialty, travel medicine, emerged in the 1980s in response to the health needs of increasing numbers of international travelers – a phenomena resulting from the rapid expansion and growing affordability of commercial jet transportation. The upward trend in international travel continues. In 1990, the World Tourism Organization (WTO) reported approximately 457 million international arrivals per year. By mid-decade, the WTO reported 783 million international arrivals per year, and just under half of these involved countries outside of Europe. When travel involves geographic translocations of people going from relatively sanitary and industrialized countries in northern temperate zones to destinations in countries with developing economies and tropical environments, potential exposures to exotic diseases and exacerbations of chronic health conditions during travel create unique health concerns.

Travel medicine is interdisciplinary in its applications: by applying a heightened geographic awareness of destination-specific diseases and environmental conditions, as well as considerations of personal safety and well-being to individual journeys – it involves a spectrum of knowledge across the health specialties of epidemiology, preventive medicine, emergency medicine, infectious diseases, tropical medicine, gastroenterology, dermatology and others.

As international travelers pursue their exploration of the world for recreational, educational, business, religious, and humanitarian purposes, physicians and other healthcare providers need to know how to counsel their traveling patients with regard to a wide variety of health issues. It has been reported that only 1–3.6% of deaths in travelers are due to infectious diseases; however, the risks for acute and chronic morbidity in the individual traveler and the potential for global spread of common as well as exotic human pathogens means that continued attention to communicable disease transmission, treatment, prevention, and control are essential considerations for international travelers (Chapters 3–8). Travel health issues involving environmental factors, from time-zone changes to air pollution, temperature extremes, and barometric influences at high altitude and under seas are covered in Chapters 2, 9, 10 and 11.

Personal safety has emerged as another important issue in traveler's health. Studies have shown that motor vehicle accidents (25%) and other injuries and accidents (15%, including drownings and falls from height) accounted for more deaths in American travelers than infectious diseases and other illnesses (10%). Heart attacks and other cardiovascular problems in male travelers over 60 years of age accounted

for 50% of reported deaths, but probably do not represent a preventable consequence of travel. Recommendations for travelers with special needs are given in Chapters 12–15.

APPROACH TO TRAVEL MEDICINE

Travel medicine practice involves the ‘travel medicine triad’ consisting of the traveler, the trip, and the proposed health interventions (Fig. 1.1). The health status of the traveler is the starting point: the very young and the very old are at increased risk from certain infectious diseases due to age-related changes in the immune system; travelers with underlying medical conditions may need more assistance in the health maintenance strategies during travel, and may even need to alter their desired itineraries based on access to healthcare at destination.

Assessment of trip risks is related to the destination(s), with travel to rural tropical areas, communities with high prevalence or outbreaks of diseases that are not vaccine-preventable, extreme environments, and remote regions presenting more challenges than trips on standard tourist routes. Updated information on outbreaks, epidemics, and health conditions abroad are posted on the websites of the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia, the World Health Organization (WHO) in Geneva, Switzerland. In addition to the CDC and WHO, regional health agencies, and public and private health information services also issue periodic guidelines and health information for international travelers. However, the guidelines are by necessity very general: the optimal practice of travel medicine calls for individualized recommendations for each traveler and trip based on the travel health assessment described by the ‘travel medicine triad’ above. International travelers should seek medical advice 4–6 weeks in advance of their departure date.

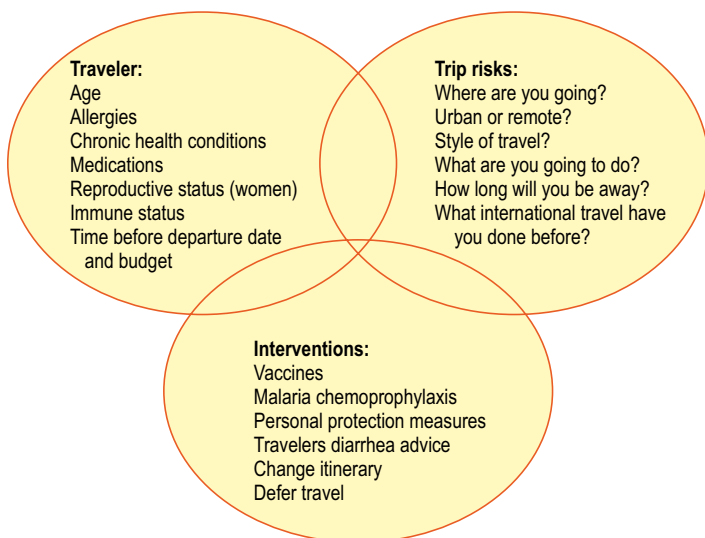


Fig. 1.1 The Travel Medicine Triad. (Courtesy of Rose S R 1993 International travel health guide, Travel Medicine, Northampton, MA.)

This allows adequate time for immunizations to be scheduled, for advice and prescriptions to be given, and for special information to be obtained when needed.

The medical approach to travel becomes even more complex when the itinerary encompasses several countries at different stages of development, or when the traveler plans a long-term trip lasting months to years. Such travelers may need to start three or more months in advance of the anticipated trip departure in order to complete vaccine series and other health documentation needed for issuance of visas, and for appropriate travel arrangements. Table 1.1 summarizes the steps for pre-travel medical preparation.

All travelers should be advised to assemble the information listed in Table 1.2 in a concise and clearly written form to carry with them. In addition, travelers should carry a supply of medications adequate to last the duration of the trip in their carry-on (not checked) luggage, and an extra pair of eyeglasses with a copy of the prescription for the corrective lenses.

TABLE 1.1 Pre-travel medical recommendations

1. Consult personal physician, local Public Health Department, or travel clinic about recommendations for immunizations and malaria chemoprophylaxis after selection of the travel itinerary, but preferably 4–6 weeks in advance of departure.
2. Prepare a 'traveler's health history' (Table 1.2) and a 'traveler's medical kit' (Table 1.4).
3. Carry a telephone credit card that can be used for international telephone calls, or a satellite phone, or make sure that the friends or relatives listed in the health history would accept an international collect call in case of an emergency.
4. Make sure to have the telephone number of your personal physician, including office and after-hours numbers, and a fax number if available. A business card attached to the 'traveler's health history' is a handy way to carry this information.
5. Check medical insurance policy or health plan for coverage for illness or accidents occurring outside the country of origin (home country).
6. Specifically inquire if the regular insurance policy or health plan will cover emergency medical evacuation by an air ambulance.
7. Arrange for additional medical insurance coverage or for a line of credit as necessary for a medical emergency situation.

TABLE 1.2 Traveler's health history

International travelers should assemble the following information in a concise and clearly written form to carry with them:

1. An up-to-date immunization record (preferably the *International Certificates of Vaccination*).
2. A list of current medications giving both trade name and generic name as well as the actual dose.
3. A list of all medical problems, such as hypertension, diabetes, asthma, and heart disease (cardiac patients should carry a copy of the most recent electrocardiogram).
4. A list of known drug allergies.
5. ABO blood type and Rh factor type.
6. Name and telephone number (and fax number, if available) of his or her regular doctor (attach a business card to the health history document).
7. Name and telephone number of the closest relative or friend in the USA who might assist if the traveler incurs serious illness while out of the country.

Health interventions to promote travel health include health education on the trip risks identified for a particular traveler and trip, and at a minimum, recommendations for immunizations, malaria chemoprophylaxis, management of traveler's diarrhea, and prevention of insect-vector-borne diseases. Although behavior modification and compliance with travel health recommendations may be just as important as receiving the vaccines and taking the recommended malaria chemoprophylaxis, obtaining and documenting desired behavior changes among travelers seeking pre-trip medical advice is one of the biggest challenges still facing travel health advisors.

Immunizations for Travel

Travelers going to destinations in tropical and developing countries from countries in North America and Western Europe are exposed to communicable diseases that are infrequently encountered at home because of a generally high standard of sanitation and mandatory childhood immunization programs. For example, adult travelers have acquired measles and chickenpox on trips abroad. Paralytic polio is transmitted outside the Western Hemisphere in developing countries, where conditions favor oral–fecal transmission, and in other countries where routine immunizations do not reach a high level of coverage among susceptible populations. Thus, all travelers should be questioned about their status with regard to the routine immunizations of childhood – tetanus, diphtheria, measles, mumps, rubella, and polio – and a primary series or booster doses of the vaccines should be given as appropriate. Vaccines against *Haemophilus influenzae b*, hepatitis A, hepatitis B, meningococcal disease, pertussis, pneumococcal disease and varicella are also included in the current childhood and pre-adolescent immunization schedules in the USA. Older children and adult travelers should be up-to-date with age-appropriate booster doses or receive primary series of these standard immunizations if travel will place them at risk (Chapter 5). Travel immunizations for children are covered in Chapter 12.

All vaccinations administered to travelers should be recorded in a copy of the yellow booklet, *International Certificates of Vaccination*, which is recognized by the World Health Organization (WHO). This record should be kept in a safe place with the passport, as it becomes a lifelong immunization record. There is a special page for validation of the yellow fever vaccine, which must be done in an official vaccination center, as well as additional pages to record the other vaccines.

Up-to-date information on areas where cholera and yellow fever are reported is best obtained from the CDC (www.cdc.gov/travel) or the WHO (www.who.org) websites. The smallpox and cholera vaccines are no longer required for international travel according to WHO regulations. In the USA, owing to relatively limited supplies and the fact that it must be given within 1 h after reconstitution of the vaccine, the yellow fever vaccine is available only from official vaccination centers registered by the Department of Public Health in each state.

Some confusion exists over the difference between *required* vaccinations and *recommended* vaccinations. In its publication *Health Information for International Travel* (commonly called 'The Yellow Book'), there is a country-by-country listing of vaccines required for entry. The Yellow Book can be ordered in printed form from the Public Health Foundation (www.publichealthfoundation.org), or can be accessed through the CDC website. Someone calling a travel clinic to ask what shots are required for a trip to Kenya or Venezuela, for instance, will be told by staff consulting *The Yellow Book* that yellow fever vaccine is not required for a traveler arriving from North America. Yet, if one refers to maps showing where yellow fever is endemic,

one can see that Kenya and Venezuela both lie within the endemic zones. Thus, yellow fever vaccine might be *recommended* to a traveler to those countries even though the vaccine is not a requirement for entry, depending on that traveler's intended activities and in-country itinerary.

Other vaccines may be recommended to travelers, depending on their destinations, degree of rural exposure during travel, eating habits, purpose of the trip, and state of health. In this group are the vaccines against hepatitis A, typhoid fever, cholera, meningococcal disease, rabies, Japanese encephalitis, and influenza. Certain travelers, such as healthcare workers, missionaries, Peace Corps volunteers, students, and any person likely to have household or sexual contact with residents in tropical or developing countries should consider immunization against hepatitis B. Travelers who are going to live or work in the People's Republic of China, India, Thailand, and other Asian countries need to consider Japanese encephalitis B vaccine. Details of travel immunizations are given in Chapter 5.

Malaria Chemoprophylaxis

In addition to travel immunizations, a major consideration for international travelers is whether their travel will take them to an area where malaria is transmitted. Malaria has a worldwide distribution in tropical and subtropical areas. It is re-emerging in areas once considered to be free from risk. Data derived from CDC statistics show that during the 1980s, the greatest number of Americans with malaria acquired the infection in Africa; while fewer contracted malaria in Asia, South America, Central America, and Mexico, the risk in these other areas remained significant. In the 1990s, malaria transmission in all these regions continued to be a serious problem for the traveler, especially because of the emergence of new drug-resistant strains in areas where the use of chloroquine phosphate was once highly effective in malaria prevention against all malaria species.

Chemoprophylaxis, or the taking of drugs to prevent clinical attacks of malaria, is recommended to most travelers going to malarious areas. In some areas of Africa, South America, Asia, and the South Pacific, infections with chloroquine-resistant *Plasmodium falciparum* malaria (CRPF) are a significant risk to travelers because falciparum malaria can rapidly progress to serious morbidity and mortality if not promptly diagnosed and treated. Information on the risk of CRPF is published in the CDC publication *Morbidity and Mortality Weekly Report*, but the CDC website (www.cdc.gov) should be consulted for current information on a given travel destination. Drugs useful in the prevention of chloroquine-resistant malaria include mefloquine (Larium®). Doxycycline (Doryx®, Vibramycin®), and atovaquone/proguanil (Malarone®). These and other antimalarial drugs are discussed in Chapters 6 and 19.

Malaria is a protozoan parasite transmitted to humans by nighttime biting female anopheline mosquitoes. Since the risk of infection is related to the number of bites sustained, and since current malaria chemoprophylaxis regimens are not completely protective, all travelers should follow certain simple precautions when visiting or staying in malarious areas (Tables 1.3, 1.4). In addition to preventing bites from mosquitoes spreading malaria, these precautions will help the traveler avoid bites from other mosquito species and insects that spread a variety of diseases in tropical and subtropical areas, for which there are no prophylactic drugs nor vaccines (dengue fever, hemorrhagic fever, several kinds of viral encephalitis, leishmaniasis, trypanosomiasis, filariasis, etc.) (Table 1.5). In an analysis of travel-associated illnesses among 17 353 returned travelers reporting to a GeoSentinel site by Freedman and

TABLE 1.3 Recommendations to avoid mosquito bites

1. Remain in well-screened areas, especially during the hours between dusk and dawn.
2. Sleep under mosquito netting if the room is unscreened.
3. Wear clothing that adequately covers the arms and legs when outdoors.
4. Apply mosquito repellent to exposed areas of skin when outdoors, and wear permethrin-treated outer clothing. The most effective mosquito repellents for application to skin surfaces contain N,N-diethyl-3-methylbenzamide (DEET) (formerly known as N,N-diethyl-m-toluamide), which is also effective against biting flies, chiggers, fleas and ticks. Clothing as well as mosquito netting can be sprayed with products containing permethrin. Permethrin does not repel insects but works as a contact insecticide that leads to the death of the insect.

TABLE 1.4 Insect repellents and insecticides^a

Examples of insect repellents containing DEET for skin application

Ultra 30™ Lotion Insect Repellent: 30% DEET in a liposome base, up to 12 h protection against mosquitoes; DEET is also effective against ticks, gnats, no-see-ums, sandflies, biting flies, deer flies, stable flies, black flies, chiggers, red bugs, and fleas (Sawyer Products, Safety Harbor, FL; distributed by Recreational Equipment Inc, REI).

Off! Deep Woods™: 23.7% DEET, up to 6 h of protection against mosquitoes and other insects. (SC Johnson, Racine, WI).

Off! Skintastic™: 6.65% DEET, up to 3 h of protection against mosquitoes and other insects (SC Johnson, Racine, WI).

Sawyer Premium Broad Spectrum Insect Repellent Spray™: contains DEET plus a special fly repellent additive, R-326; use according to package directions (Sawyer Products, Safety Harbor, FL)

Examples of permethrin-containing insecticides for application to external clothing and mosquito nets (Fig. 1.2)

Permethrin for Clothing Tick Repellent: Contains permethrin in a non-aerosol pump spray can; repels ticks, chiggers, mosquitoes, and other bugs (Sawyer Products, Safety Harbor, FL). One application lasts 4 weeks or through six washings.

PermaKill Solution: 13.3% permethrin liquid concentrate supplied in 8 oz bottle, can be diluted (1/3 oz permethrin concentrate in 16 oz water) to be used with a manual pump spray bottle; or diluted 2 oz in 1½ cups of water to be used to impregnate outer clothing, mosquito nets, and curtains (Sawyer Products, Safety Harbor, FL). Permethrin impregnation of garments or mosquito netting will achieve protection for up to 1 year or good for 30 launderings.

^aBrand names are given for identification purposes only, and do not constitute an endorsement.

co-authors, vector-borne diseases accounted for almost 40% of the case reports, exceeding respiratory transmitted diseases and food- and water-borne diseases, respectively.

Traveler's Diarrhea

Between 30% and 60% of travelers to tropical countries are affected by 'traveler's diarrhea'. This illness is characterized by sudden onset of four to five movements of watery diarrhea per day, sometimes accompanied by abdominal cramps, malaise, nausea, and vomiting. An attack typically lasts 3–6 days.

The pathogens causing gastrointestinal disease are acquired mostly through fecal–oral contamination, and preventive strategies to avoid illness include careful selection of food and water. Adequate means for purification of water vary depending on the water source. Bringing water to the boil is probably the most reliable

TABLE 1.5 Important arthropod-borne diseases

Arthropod vector	Biting characteristics	Disease
<i>Anopheles</i> mosquitoes	Evening and nighttime Indoors and outdoors Mainly rural	Malaria Lymphatic filariasis (<i>W. bancrofti</i> , <i>B. malayi</i> , <i>B. timori</i>) Rift Valley fever O'nyong-nyong fever
<i>Aedes</i> mosquitoes	Daytime (dusk, dawn) Usually outdoors Mostly urban	Dengue fever Yellow fever Chikungunya fever Lymphatic filariasis Rift Valley fever Ross River fever Venezuelan equine encephalitis
<i>Culex</i> mosquitoes	Usually evening and nighttime Mostly outdoors Rural and urban	Japanese encephalitis Lymphatic filariasis Venezuelan equine encephalitis St Louis encephalitis West Nile encephalitis Murray Valley encephalitis Ross River Fever Rift Valley Fever Chikungunya Fever
<i>Mansonia</i> mosquitoes	Usually nighttime Usually outdoor Rural and urban	Venezuelan equine encephalitis Chikungunya fever Lymphatic filariasis
Fleas	Night or daytime Indoors or outdoors Urban and rural	Plague Endemic (murine or flea-borne) typhus
Body lice	Night or daytime Indoors or outdoors Urban and rural	Trench fever Louse-borne relapsing fever Epidemic (louse-borne) typhus
Ticks	Day and nighttime Outdoors Rural	Mediterranean spotted fever African tick typhus Rocky mountain spotted fever Queensland tick typhus Congo Crimean hemorrhagic fever Omsk hemorrhagic fever Lyme disease Ehrlichiosis Tularemia Babesiosis Tick-borne relapsing fever Tick paralysis
Mites	Day or nighttime Indoors or outdoors Urban or rural	Scrub (mite-borne) typhus Rickettsialpox
Culicoides midges ('no-see-ums')	Day or nighttime Usually outdoors Rural	Mansonellosis
Deer and horseflies (<i>Tabanids</i>)	Daytime Outdoors Rural	Loiasis Tularemia

Continued

TABLE 1.5 Important arthropod-borne diseases—cont'd

Arthropod vector	Biting characteristics	Disease
Black flies (<i>Simulium</i>)	Daytime Outdoors Rural	Onchocerciasis (river blindness)
Sandflies (<i>Phlebotomus</i> , <i>Lutzomyia</i>)	Nighttime Usually outdoors Urban and rural	Cutaneous leishmaniasis Visceral leishmaniasis (Kala azar) Bartonellosis (Oroya Fever) Sandfly fever
Tsetse flies (<i>Glossina</i>)	Daytime Outdoors Rural	African trypanosomiasis (African sleeping sickness)
Triatomine/ reduviid bugs	Nighttime Indoors Rural and urban	American trypanosomiasis (Chagas' disease)

Source: Vernon Ansdell, personal communication, 2007.

way to kill pathogens up to 20 000 feet above sea level. Water purification tablets are convenient and commercially available, and are almost as effective as boiling when the water is at 20°C (68°F); the water-tablet mixture is shaken or stirred every 5 min for a total duration of 30 min. For a summary of commonly used chemical methods for water purification, see Table 1.6. Portable water purification filters have become a popular alternative employed by many travelers; the devices using iodine-resin technology have proved to be effective against the broadest range of pathogens. Water purification is discussed in detail in Chapter 8.

Owing to widespread publicity in the lay press, many travelers want to know more about the use of antibiotics to prevent diarrhea while traveling. A 'Traveler's Diarrhea Consensus Development Panel' convened by the National Institutes of Health in January 1985, advised against using drugs as a preventive measure for traveler's diarrhea; the chief objections cited were the occurrence of undesirable side-effects and the potential for allergic reactions. The panel acknowledged that for the short-term traveler (travel <3 weeks), the risk of traveler's diarrhea might be decreased by daily prophylactic doses of bismuth subsalicylate (PeptoBismo[®]), or even daily doses of antibiotics. This subject is discussed in detail in Chapter 7.

MEDICAL EMERGENCIES DURING TRAVEL

Emergency medical care abroad is not a subject likely to be broached by the average travel agent, for fear of alarming the potential traveler. Yet all travelers, especially those planning long-term travel (trips of 3 weeks or longer), the very young and the very old, and those with special medical conditions (cardiac, pulmonary, gastrointestinal, or hematologic problems; pregnancy; HIV infection; organ transplant, etc.) need to have a plan in case the need for emergency medical care arises. Even the young traveler in perfect health can break a leg, be involved in a motor vehicle accident, or be bitten by a rabid dog.

People planning trips to exotic places, but who will stay in urban, first-class hotels, may have relatively easy access to English-speaking physicians with Western-style biomedical training. However, many places where modern tourists go are far from

Technique for impregnating clothing or mosquito netting with Permethrin solution

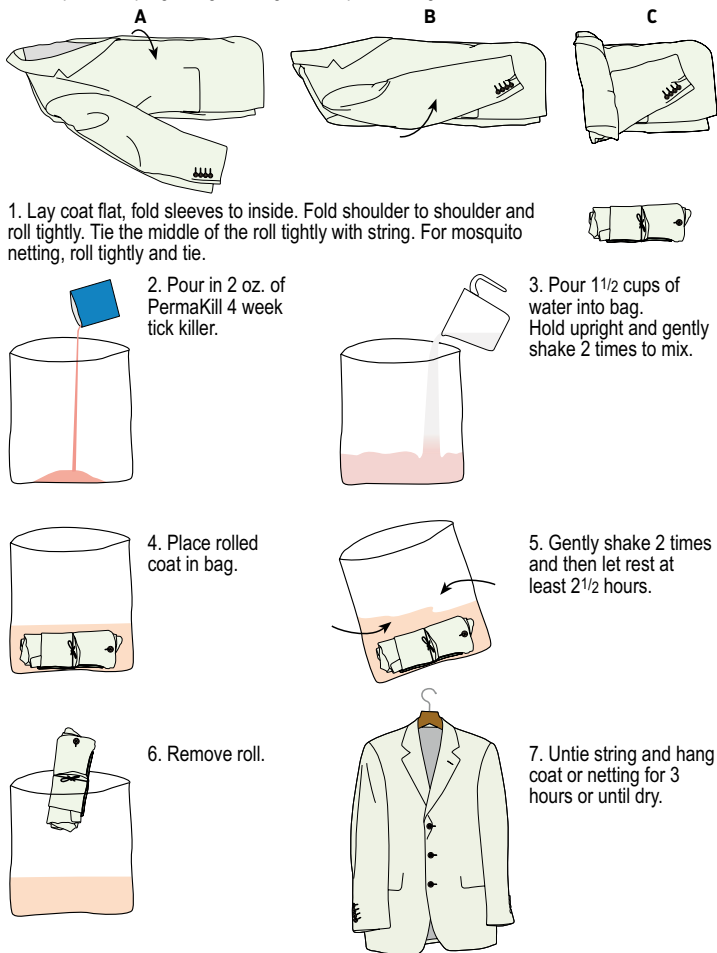


Fig. 1.2 How to apply permethrin to your clothing.

English-speaking medical practitioners and Western-style hospitals. At some travel destinations, medications for treatment of certain infections and special medical conditions may not be available under any circumstances. Thus, for such travelers, pre-travel counseling, preparation of the traveler's medical kit, and a medical emergency evacuation plan are of great importance.

Finding a Physician in a Foreign Country

For travelers with specific medical conditions, the treating physician at home will often be able to supply the names of colleagues in foreign countries that could be consulted in case of emergency. Professional associations such as the International

TABLE 1.6 Methods for purification of water^a

Method	Brand name	Quantity to be added to 1 quart or 1 l of water
Iodine compound tablets ^b	Potable Aqua, Coughlins	Two tablets are added to water at 20°C, and the mixture is agitated every 5 min for a total of 30 min.
Chlorine solution, 2–4%	(Common laundry bleach)	Two to four drops are added to water at 20°C, and after mixing, the solution is kept for 30 min before drinking.
Iodine solution ^b	(2% tincture of iodine)	Five to ten drops of iodine are added to water at 20°C, and after mixing, the solution is kept for 30 min before drinking.
Heat		Water is heated to above 65°C for at least 3 min. (At 20 000 ft altitude or 6000 m, water boils at 70 C.)

^aThe methods presented here are sufficient to kill *Giardia* cysts in most situations. Heat is the best method when tested in a laboratory situation. (See Chapter 8 for more detailed information.)

^bIodine-containing compounds should be used with caution during pregnancy.

Society of Travel Medicine (ISTM, www.istm.org) and the American Society of Tropical Medicine and Hygiene (ASTMH, www.astmh.org) maintain membership directories that include clinical members working in many destination countries. Foreign embassies often have lists of local physicians that have provided care to their staff. University or other teaching hospitals can be relied upon to provide quality care and are likely to have staff members who speak English and other languages. The International Association for Medical Assistance to Travellers (IAMAT, www.iamat.org) is another resource for travelers. Among its many services, this non-profit organization provides to its members lists of English-speaking physicians who have agreed to care for travelers in many countries around the world.

Emergency Information Needed

The Traveler's health history (Table 1.2) and the *International Certificates of Vaccination* should be carried with the passport at all times. Although a medical-alert bracelet or necklace (available for order in most pharmacies or from internet vendors) is recommended to travelers with life-threatening allergies or medical conditions, people offering assistance in some countries may not recognize the significance of, or even look for, such identification.

Payment for Services

Coverage for emergency medical services abroad should be verified with the regular insurance company or healthcare plan before the trip. Medicare will not cover services provided in foreign countries, with the exception of an urgent problem arising *en route* from the USA to Alaska that requires medical treatment in Canada. Several companies specializing in medical insurance for travelers are listed in the Appendix at the end of this chapter.

Payment for medical services abroad is customarily due when care is given, but travelers will need to save the receipts for reimbursement by their health coverage plan. Insurance companies are unlikely to pay for procedures or treatments that are experimental or not available in the USA.

Emergency Medical Care *en route*

At the time of writing, most international commercial aircraft carry an emergency first aid kit, with supplies and equipment for a basic life support response. Advanced life-support equipment and drugs may not be available for passengers with acute cardiac or pulmonary emergencies, although some aircraft do carry automatic external defibrillator (AED) units. Generally, oxygen is available only in the event of cabin decompression, although some airlines carry small portable tanks for medical emergencies. Patients with chronic pulmonary conditions requiring supplemental oxygen must make arrangements at the time of reservation for supplies of in-flight portable oxygen tanks. In the event of a serious medical emergency that occurs during flight, most commercial aircraft will re-route and land at the closest commercial airport. Chapter 4 presents further details of air carrier health issues, and Chapter 15 further explores medical issues for travel with chronic medical conditions.

Commercial international cruise ship lines carrying fee-paying passengers are required by maritime law to have a physician on board at sea. The qualifications of the ship's physicians and the availability of advanced life-support equipment and drugs may vary from line to line, so specific inquiries should be made.

Emergency Evacuation Home

Contingency plans for a medical emergency should be discussed openly and the need for special travel insurance coverage considered with all travelers regardless of underlying health. Even a healthy young traveler is at risk for contracting a serious illness or accidental injury during travel.

Some commercial airlines will allow passage of a seriously ill person back to the USA, only when that person is accompanied by a licensed physician. Payment of the physician and purchase of his/her round-trip airfare must be provided in such cases. In other cases, emergency evacuation home must proceed by way of specially equipped aircraft (helicopters and fixed-wing aircraft), which usually carry their own teams of medical personnel, including physicians and nurses. Costs for such evacuations can run to tens of thousands of dollars, depending on geographic location, weather conditions and medical needs.

Emergency evacuation insurance is available; however, prospective subscribers need to read the terms carefully, as some plans provide only for evacuation to the nearest regional medical center, not for transport back to a medical facility in the traveler's home country. Given that very ill people would prefer to receive a customary standard of care, evacuation of a patient to a foreign medical center, where English and other Western languages may be spoken as a second language, and where medical protocols are different, may not be as satisfactory as evacuation back to the traveler's country of origin. Names and addresses of organizations arranging international emergency transport services for their members are given in the Appendix at the end of this chapter.

Emergency Blood Transfusion

The traveler's blood type, if known, should be listed in the traveler's health history and/or in the space provided in the *International Certificates of Vaccination* booklet. If an urgent blood transfusion becomes necessary, however, and the blood type is unknown, the traveler's blood can be quickly typed and then tested against the donor's blood. However, in certain parts of the world, certain blood types may not be easily obtainable. For instance, in the People's Republic of China, the predominant blood type is A-positive among the resident population.

Travelers with bleeding conditions or tendencies (e.g., those on anticoagulation therapy or those with a history of bleeding peptic ulcers) should probably get information from their local blood bank before they leave about resources in the countries to be visited.

WILDERNESS AND ADVENTURE TRAVEL

The more remote from access to established medical care facilities, the more the traveler has to anticipate self-care or peer-care for medical problems that might occur. Many of the medical concerns arising during adventure travel are covered throughout this book. However, the treatment of serious injuries and trauma in the wilderness and the approach to survival skills is beyond the scope of this book. Specific preparation and equipment may be needed for survival in wilderness settings or extreme environments.

The adventure or expedition traveler planning a remote and/or challenging route is advised to get accurate information regarding the physical difficulty and inherent environmental risks associated with the trip itinerary, to carefully review the qualifications and personalities of the trip leader(s) and fellow adventurers, to query the dietary arrangements for the trip, and to verify the possibilities for emergency evacuation. In addition, adventure travelers should acquire advanced first-aid skills and prepare themselves to be in optimal physical condition prior to departure. Further information may be obtained from consulting some of the references listed at the end of the chapter, and also The Wilderness Medical Society (see Appendix).

THE TRAVELER'S MEDICAL KIT

Table 1.7 presents recommendations for a traveler's medical kit for a short-term international trip. Depending on geographic locations, types of activities planned, and underlying health, the traveler may augment the kit with regular prescription medications, medication for high-altitude sickness, anti-fungal preparations, pesticide preparations for ectoparasites, and additional antiparasitic drugs. Pulmonary patients may need to make arrangements for portable oxygen supplies and even oxygen concentrator machines, and peritoneal dialysis patients may travel with dialysate fluids and accessories, and need advance reservations for access to dialysis services at destination (see Chapter 15).

Prescription Medications

Travelers should not pack their entire supply of prescription medications into checked luggage, as the baggage could be lost in transit. At least a few days' supply of necessary medications should be taken in hand-held luggage. Preferably, the entire supply of usual prescription medications, enough to last the whole trip should be taken in the hand-held luggage.

SUMMARY OF CONSIDERATIONS FOR HEALTH AND TRAVEL

In addition to travel immunizations, malaria chemoprophylaxis, prevention of traveler's diarrhea, and prevention of insect-vectored diseases, travelers need to be counseled about common medical problems of international travel that may be related to the mode of transportation, changes in altitude, changes in time zones, increased exposure to sun, taking of new drugs, and changes in climate and humidity (Chapters 2, 8–11).

TABLE 1.7 The traveler's personal medical kit^b

Below are listed some of the suggested items for the traveler's personal medical kit. Not all of these items are necessary or appropriate for every traveler: items should be selected based on the style of travel and destination(s).

Prescription items^a

Antibiotics, general: Antibiotics may be useful for travelers at risk for skin infections, upper respiratory infections (URIs), and/or urinary tract infections (UTIs), as well as for treatment of traveler's diarrhea (TD).

Skin infections:

Mupirocin 2% (*Bactroban*) topical antibiotic ointment: 15 g tube or 1 g foil packets. Apply to infected skin lesions three times a day; or

Cephalexin, (or cephadrine) 500 mg capsule. One p.o. q 6 h × 7 days (*not effective for methicillin-resistant Staphylococcus aureus (MRSA): if MRSA infection suspected, seek immediate medical care for treatment*); or

Amoxicillin 875 mg/Clavulanate 125 mg tablet. One p.o. q 12 h × 7 days (*not effective for methicillin-resistant Staphylococcus aureus (MRSA): if MRSA infection suspected, seek immediate medical care for treatment*).

Upper respiratory tract infections (sinusitis, bronchitis):

Azithromycin, 250 mg tablet. Two tablets p.o. first dose, followed by 1 tablet p.o. q 24 h × 4 additional days; or

Amoxicillin 875 mg/Clavulanate 125 mg tablet. One p.o. q 12 h × 7 days.

Urinary tract infections (uncomplicated):

TMP/SMX DS tablet: One p.o. q 12 h × 3 days; or

Ciprofloxacin, 250 mg tablet: One p.o. q 12 h × 3 days.

Multipurpose antibiotics: These would provide empiric coverage for skin infections, URI, and UTI.

(Note that ciprofloxacin and levofloxacin are commonly used for treatment of traveler's diarrhea as well):

Amoxicillin 875 mg plus clavulanate 125 mg tablet (*Augmentin* 875 mg). One p.o. q 12 h × 3–7 days; or

Ciprofloxacin (*Cipro*), 500 mg tablet. One p.o. q 12 h × 3–7 days; or

Levofloxacin (*Levoquin*), 500 mg tablet. One p.o. q 24 h × 3–7 days.

Allergic reactions: (To bee, wasp, yellow jacket, or hornet stings; food, etc.).

Epi Pen emergency injection of epinephrine:

Use according to package directions for severe reaction to bee sting or for other allergic reaction causing shortness of breath or wheezing; or swelling of the lips, eyes, throat, or severe hives.

This will give short-acting relief. As soon as the afflicted person can swallow, give them *Benadryl* tablets as directed below.

Benadryl (diphenhydramine), 25 mg tablet (non-prescription):

Take 2 tablets by mouth immediately, then 1–2 tabs q 6 h × 2 days following an allergic reaction.

Use *Benadryl* alone for mild to moderate allergic skin reactions and itching, and take *Benadryl* following the use of the *EpiPen*.

Medrol DosePack (methylprednisolone):

For use with severe and persistent allergic reactions or skin rashes. Follow the instructions for the tapering dose schedule in the packet. May be required in addition to *Benadryl* for severe allergic reactions.

Albuterol or salbuterol inhaler (MDI, multidose inhaler):

Use for asthma attacks or for allergic reactions that cause persistent wheezing. Two puffs 2 min apart, each inhaled as deeply as possible into the lungs; up to 4 times a day.

Cough suppressant: A small bottle of prescription cough syrup or a few tablets of codeine-containing medication (*Tylenol No. 3* tablets will serve this purpose as well as that of medication for severe headache or pain).

TABLE 1.7 The traveler's personal medical kit^b—cont'd

Diarrhea treatment: An antimotility drug such as loperamide (*Imodium*) (non-prescription) plus an antibiotic (e.g., trimethoprim/sulfamethoxazole, ciprofloxacin, levofloxacin, azithromycin) may be prescribed for self-treatment (see Chapter 7).

High-altitude illness: Acetazolamide (*Diamox*) may be prescribed for prophylaxis of high-altitude illness for high-altitude destinations (see Chapter 10).

Jet lag: In some cases, a short-acting sleeping medication is helpful in treating sleeping problems associated with jet lag (see Chapter 9).

Malaria pills: As the malaria situation in many countries continues to change, malaria chemoprophylaxis changes as well. Updated information on the malaria situation for specific destination(s) needs to be carefully reviewed, and appropriate medications prescribed (see Chapter 6).

Motion sickness: Travelers who experience motion sickness may be prescribed a medication for this (Chapter 9).

Nausea and vomiting: *Compazine* (prochlorperazine), 25 mg rectal suppository. This may be helpful when oral medications cannot be tolerated and an injectable antiemetic is not available.

Pain relief: A modest supply of prescriptive pain medication may be needed for headache, toothache, or musculoskeletal injury.

Tylenol No. 3 (acetaminophen with 30 mg codeine) tablets: 1–2 tablets p.o. q 4–6 h p.r.n. severe headache or pain; or

Dilaudid (hydromorphone), 2 mg tablets: 1–2 tablets p.o. q 4 h for relief of severe pain (useful for people allergic or intolerant to codeine).

Non-prescription items

Aspirin, acetaminophen (*Tylenol*), ibuprofen (*Advil*, *Nuprin*), or naproxen (*Aleve*): For general relief of minor aches and pains or headache.

Antibiotic ointment: (*Neosporin* or *Bacitracin*) for topical application on minor cuts and abrasions.

Antifungal powder or cream: For travelers prone to athletes' foot and/or other fungal skin problems.

Antifungal vaginal cream or troches: For women prone to yeast vaginitis associated with changes in climate or following antibiotic use (see Chapter 13)

Antihistamine tablets (diphenhydramine, chlorpheniramine, loratadine, etc.): For relief of nasal and skin symptoms due to allergies.

Decongestant tablets (*pseudoephedrine*, etc.): For nasal congestion due to colds, allergies, or water sports.

Diarrhea, traveler's: Bismuth subsalicylate (*Pepto Bismol*), or loperamide (*Imodium*) tablets may be taken to manage symptoms of traveler's diarrhea (see Chapter 7).

Hydrocortisone 1% cream: For topical relief of itching due to insect bites or sunburn.

Laxative: For relief of 'traveler's constipation' due to changes in diet and schedule. Patients with a history of this problem may need to take a fiber supplement and/or a stool softener.

Oral rehydration solution: *WHO-ORS* (Jianas Brothers, Kansas City, MO) or *Ceralyte* (Cera Products, Columbia, MD): packets of balanced oral rehydration salts and sugar to be mixed in purified water safe for drinking for fluid replacement and rehydration during severe diarrhea (see Chapter 7).

Throat lozenges: For relief of throat irritation due to air pollution or upper respiratory infection.

General health and first-aid supplies

Antiseptic solution: Topical solution for cleansing of minor cuts and abrasions (*Hibiclens*).

Bandages: adhesive bandage strips with sterile pad (*BandAids*), 4 × 4 inch sterile gauze pads 2 inch roll gauze dressing.

Elastic bandage: For minor sprains (*Ace wrap*).

Eyeglasses: If corrective lenses are used, bring an extra pair of eyeglasses along.

Case (waterproof): To hold medications and supplies; or organize medications and supplies in zipper-lock plastic bags.

TABLE 1.7 The traveler's personal medical kit^b—cont'd

<p>Condoms (Latex): For prevention of sexually transmitted diseases.</p> <p>Hand sanitizer (waterless) or pre-moistened towelettes.</p> <p>Insect repellent (with DEET): For topical application to exposed areas of skin (Tables 1.3, 1.4).</p> <p>Insecticide spray (with permethrin): For application to external clothing, mosquito nets, curtains, etc. (Tables 1.3, 1.4).</p> <p>Moleskin or blister bandages: For prevention of blisters on feet.</p> <p>Safety pins: The rustproof baby diaper pin types are useful for all kinds of emergency repairs, pinning room curtains shut, hanging laundry on wire hangers, etc.</p> <p>Sanitary supplies (menstruating women): Tampons, sanitary napkins (these may not be readily available in tropical and developing parts of the world). (<i>See Chapter 13 for other useful components of a travel medicine kit for women.</i>)</p> <p>Scissors: For general use, if not included in pocket knife.</p> <p>Skin glue: for repair of minor lacerations, in place of sutures.</p> <p>Swiss army knife (or similar): An all-purpose gadget, especially useful if tweezers and scissors are included.</p> <p>Sunglasses: With UV light protective lenses.</p> <p>Sunscreen: Any brand with sun protective factor (SPF) sufficient to protect against UV-A and UV-B.</p> <p>Tape, adhesive: For first aid wound care.</p> <p>Tape, duct: For general repairs, creating splints, etc.</p> <p>Tick pliers: For participants in outdoor activities; to remove ticks safely and completely (Fig. 1.3).</p> <p>Toilet paper: Often not available in public rest facilities when one is in desperate need (buy a compact roll, available in sporting supply stores).</p> <p>Thermometer, oral: Very important for assessment of illness while traveling.</p> <p>Urinary deflector: Device allowing women to urinate from a standing position (see Chapter 13).</p> <p>Venom extractor pump: To extract venom from venomous insect stings and snake bites (Fig. 1.4).</p> <p>Water disinfection chemicals (Table 1.5).</p> <p>Water disinfection device, portable (see Chapter 8).</p>
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^aDosage information applies to adults in good health without contraindications to the given drug.

^bTrademark names are provided for identification only and do not constitute an endorsement.

It is important to know the female traveler's reproductive plans or if she is possibly pregnant. The physical demands and geographic factors of travel may influence the pregnancy. Additionally, certain required or recommended vaccines may be contraindicated, as may some drugs used for malaria chemoprophylaxis or for the relief of common traveler's ailments (Chapter 13).

Travelers with human immunodeficiency virus (HIV) infection need thoughtful pre-travel counseling on vaccines, potential drug interactions, geographic infectious disease hazards, and access to medical care during travel (Chapter 14). When the traveler has an underlying medical condition, travel arrangements and health recommendations become increasingly important (Chapter 15).

If an extended stay abroad is anticipated (≥ 6 months), even generally healthy persons should have a routine physical examination, including an evaluation of tuberculosis status (skin test or screening chest X-ray), routine screening laboratory tests, and blood typing. The long-term traveler should also have a complete dental examination. Sometimes the form and content of the pre-travel medical evaluation

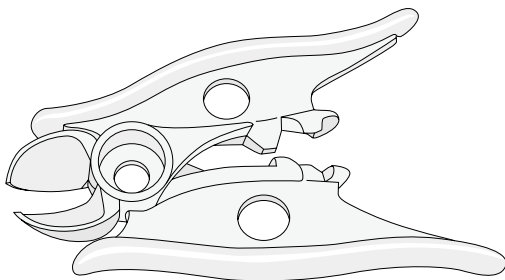


Fig. 1.3 The tick plier. A lightweight plastic device for safe and complete removal of ticks. (See the Appendix at the end of this chapter for mail-order suppliers.)



Fig. 1.4 The extractor. Venom extractor pump for first aid treatment of venomous insect stings and snake bites. (See Appendix at the end of this chapter for mail-order suppliers.)

will be dictated by the requirements of the sponsoring employer or agency, the health insurance carrier, or even the application for a foreign student visa, foreign resident status, or a foreign work permit. Requests from foreign governments for pre-travel syphilis serology, HIV serology, examination of a stool specimen for ova and parasites, and chest X-ray are not uncommon when individuals apply for temporary residency (Chapters 16, 17).

Diseases spread by sexual and intimate contact should also be discussed with the international traveler, especially those going abroad for an extended stay. In addition to the sexually transmitted diseases (STDs) frequently seen in northern temperate climates (gonorrhea, syphilis, chlamydia, hepatitis B, and infection with herpes simplex virus and HIV), lymphogranuloma venereum, chancroid, and granuloma inguinale are a risk in many tropical and developing countries.

The prevalence of HIV infection is of course many times higher than the number of AIDS cases reported, and the infection is present in all countries. In Africa and Asia, heterosexual intercourse is a major mode of transmission of HIV. Recent reports suggest that sexual contact with residents of developing countries occurs with surprising frequency among tourists, business travelers, and expatriate workers. International travelers need to be warned of the risk of sexual contact with strangers, regardless of sexual orientation, and particularly of contact with sex-industry workers, in whom HIV infection and other STDs are more prevalent (Chapters 37–40).

Finally, when the traveler returns home with a significant change in health, providers of medical care need to be acquainted with the signs and symptoms of serious tropical diseases. For example, misdiagnosis of a case of *P. falciparum* malaria as the 'flu' can lead to tragic consequences for the patient, or an occult infection with *Strongyloides stercoralis* may threaten the health of a patient who has survived organ transplantation but must be maintained on immunosuppressive drugs. A patient

passing a large intestinal worm, while usually not facing a life-threatening situation, may still present to an emergency room in a state of extreme anxiety and fright. An appreciation of the geographic distribution of tropical and exotic diseases and the risk factors contributing to the transmission of disease can help the healthcare provider to generate an appropriate differential diagnosis for illness occurring in the returned traveler (Chapters 19–45). A similar approach is used for the health screening of immigrants, refugees, and international adoptees, because they, too, are members of the population of international travelers (Chapter 18).

FURTHER READING

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- Weiss E A 1992 *A comprehensive guide to wilderness and travel medicine*. Adventure Medical Kits, Berkeley
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APPENDIX

TABLE A.1 Global health information resources

Centers for Disease Control and Prevention (CDC)

website: www.cdc.gov

World Health Organization (WHO)

website: www.who.org

Association for Safe International Road Travel (ASIRT)

11769 Gainsborough Rd

Potomac, MD 20854

Tel. 301-983-5252

website: www.asirt.org

(Information for travelers on road safety conditions throughout the world; road travel reports for 150 countries.)

Bureau on Consular Affairs

US State Department

website: www.travel.state.gov

(Country-by-country information on document requirements, health issues, road safety information, and tips for travel abroad.)

International Association for Medical Assistance to Travelers (IAMAT)

40 Regal Rd

Guelph, Ontario N1K 1B5

Tel. 519-836-0102

website: www.iamat.org

(Non-profit organization that provides medical information for countries around the world as well as associated English-speaking doctors.)

iJet Intelligent Risk Systems

910F Bestgate Rd

Annapolis, MD 21401

Tel. 410-573-3860

website: www.ijet.com

(Health and security information for international businesses by subscription.)

Travax

Shoreland, Inc.

PO Box 13795

Milwaukee, WI 53213-0795

website: www.shoreland.com

(Information services for travel health professionals by subscription.)

Travel Medicine Advisor

AHC Media LLC

3525 Piedmont Rd

Atlanta, GA 30305

Tel. 404-262-7436

website: www.travelmedicineadvisor.com

(Monthly newsletter for travel health professionals by subscription.)

TABLE A.2 CDC sources for malaria prophylaxis, diagnosis, and treatment recommendations

Type of information	Source	Availability	Tel. number, website, or e-mail address
Prophylaxis	CDC's voice information system	24 h/day	877-394-8747 (877-FYI-TRIP)
Prophylaxis	CDC's Traveler's Health fax information service	24 h/day	888-232-3299
Prophylaxis	CDC's Traveler's Health website (includes online access to Health Information for International Travel)	24 h/day	http://www.cdc.gov/travel
Prophylaxis	Health Information for international Travel (<i>The Yellow Book</i>)	Order from Public Health Publication Sales, PO Box 753, Waldorf, MD 20604	877-252-1200 or 301-645-7773 or http://www.phf.org
Diagnosis	CDC's Division of Parasitic Diseases diagnostic website (DPDx)	24 h/day	http://www.dpd.cdc.gov/dpdx
Diagnosis	CDC's Division of Parasitic Diseases diagnostic website (DPDx)	Order by electronic mail from CDC Division of Parasitic Diseases	dpdx@cdc.gov
Treatment	CDC's Malaria Branch	0800-1630 Eastern Time, Monday-Friday	770-488-7788*
Treatment	CDC's Malaria Branch	1630-0800 Eastern Time, evenings, weekends, and holidays	770-488-7100* (This is the number for the CDC's Emergency Operations Center. Ask staff member to page person on call for Malaria Branch). http://www.cdc.gov/malaria/diagnosis_treatment/treatment.htm

TABLE A.3 Professional organizations with publications and educational programs of interest to practitioners of travel and tropical medicine

American College of Emergency Medicine (ACEP) website: www.acep.org
American Public Health Association (APHA) website: www.apha.org
American Society of Tropical Medicine and Hygiene (ASTMH) website: www.astmh.org (Membership directory of clinical travel and tropical medicine providers; certificate examination offered.)
Infectious Diseases Society of America (IDSA) website: www.idsa.org (Membership directory of infectious diseases specialists.)
International Society of Travel Medicine (ISTM) website: www.istm.org (Membership directory of travel health providers; certificate examination offered.)
Wilderness Medical Society (WMS) website: www.wms.org

TABLE A.4 Emergency medical assistance for travelers

MEDEX Insurance Services, Inc. PO Box 19056 Baltimore, MD 21284 Tel. 1-800-732-5309, between 0800–1700 EST, Monday–Friday website: www.medexassist.com
International SOS Pte Ltd Worldwide Headquarters 331 North Bridge Road #17-00 Odean Towers Singapore 188720 Tel. 65-6338-2311 website: www.internationalsos.com

TABLE A.5 Vendors of travel accessories and gear

<p>Chinook Medical Gear, Inc 120 Rock Point Drive, Unit C Durango, CO 81301 Tel. 800-766-1365 website: www.chinookmed.com (Custom medical solutions for harshest environments on earth; gear for adventure travel, expeditions and scientific explorations.)</p> <p>Magellan's Travel Gear 110 W. Sola Street Santa Barbara, CA 93101 Tel. 800-962-4943 website: www.magellans.com (Travel accessories, supplies, clothing, and luggage.)</p> <p>Recreational Equipment Inc. (REI) Sumner, WA 98352-0001 Tel. 800-426-4840 website: www.rei.com (Clothing, supplies and gear for outdoor adventure travel.)</p> <p>Travel Smith Outfitters 60 Leveroni Court Novato, CA 94949 Tel. 800-950-1600 website: www.travelmith.com (Clothing and supplies for travel.)</p>

TABLE A.6 Celsius to Fahrenheit conversion table

Celsius	Fahrenheit	Celsius	Fahrenheit	Celsius	Fahrenheit
0	32	31	87.8	72	161.6
0.1	32.18	32	89.6	73	163.4
0.2	32.36	33	91.4	74	165.2
0.3	32.54	34	93.2	75	167
0.4	32.72	35	95	76	168.8
0.5	32.9	36	96.8	77	170.6
0.6	33.08	37	98.6	78	172.4
0.7	33.26	38	100.4	79	174.2
0.8	33.44	39	102.2	80	176
0.9	33.62	40	104	81	177.8
		41	105.8	82	179.6
1	33.8	42	107.6	83	181.4
2	35.6	43	109.4	84	183.2
3	37.4	44	111.2	85	185
4	39.2	45	113	86	186.8
5	41	46	114.8	87	188.6
6	42.8	47	116.6	88	190.4
7	44.6	48	118.4	89	192.2
8	46.4	49	120.2	90	194
9	48.2	50	122	91	195.8
10	50	51	123.8	92	197.6
11	51.8	52	125.6	93	199.4
12	53.6	53	127.4	94	201.2
13	55.4	54	129.2	95	203
14	57.2	55	131	96	204.8
15	59	56	132.8	97	206.6
16	60.8	57	134.6	98	208.4
17	62.6	58	136.4	99	210.2
18	64.4	59	138.2	100	212
19	66.2	60	140	200	392
20	68	61	141.8	300	572
21	69.8	62	143.6	400	752
22	71.6	63	145.4	500	932
23	73.4	64	147.2	600	1112
24	75.2	65	149	700	1292
25	77	66	150.8	800	1472
26	78.8	67	152.6	900	1652
27	80.6	68	154.4	1000	1832
28	82.4	69	156.2		
29	84.2	70	158		
30	86	71	159.8		

Provided by www.metric-conversions.org