Comprehensive Care of Travelers

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Travel, especially if it is international, often means major changes for the family. Family physicians should assess the epidemiologic risk and psychosocial significance of travel or relocation in light of the family's life-cycle stage and antecedent health. Using core references, which are kept current in partnership with public health agencies, family physicians are able to provide comprehensive immunization, medications, and patient education for all travel risks. Families are given medical record summaries and recommended sources of care at their destination. Eight weeks after their return patients are reassessed for newly acquired illness and helped to integrate the perspectives gained during the travel into the family's future dynamics. Taking advantage of growing travel medicine opportunities, family medicine educators should base the care of travelers and teaching of residents on defined competence priorities. Travelers' health provides a mutually rewarding model of shared care with public health consultants in the community medicine curriculum.

Family physicians are a logical source of care and advice for family members of all ages who travel. Of the 10 to 15 million Americans who travel abroad (excluding Canada) each year, one half go to developing countries[1] and 20 percent become ill while abroad.[2] Judging from the 12,000 calls received annually by the Centers for Disease Control (CDC) from travelers seeking advice (E.H. Paz, CDC, personal communication, 1983), primary care physicians may not be currently viewed as resources in "emporiatrics," ie, the science of the health of travelers.[3] Yet even where local health departments are large enough to offer competent counsel, their jurisdiction usually stops short of providing the two preventive measures most important to the international traveler—malaria prophylaxis prescriptions and clinically based travel-risk assessments. In focusing on comprehensive and continuing clinical care, family medicine contrasts with the two customary sources of emporiatric advice. Public health traditionally deals with the "environmental" and "agent" (especially the infectious) sides of the classic epidemiologic triangle; military medicine[4] concentrates on the third side, keeping healthy a specific subclass of "host," the young male. Deriving from these two sources, conventional travel medicine lacks emphasis on continuity of clinical care and on the behavioral meaning of travel and specific needs of travelers at different stages of the family life cycle. Family medicine contributes these emphases, allowing a personalized assessment of the traveler's risks.

The thesis of this article is that a complementary partnership between the family physician and the local or state health department will ensure the comprehensive and continuing care that traveling families or individuals often lack. Because emporiatrics is a natural, though neglected, aspect of family medicine, it belongs in family practice residencies, where it can model "shared care" with public health consultants. The more specific purpose of the article is to outline a comprehensive risk-assessment approach to the traveling family, to identify resources in the public health sector for keeping the details of that approach current, and to present competence priorities in emporiatrics for family physicians and educators. While it emphasizes international travel, this approach can be adapted to patients whose travels or relocations may be less extensive in distance, yet have equally wide-ranging

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TABLE 1. ASSESSING TRAVELERS' RISK

Risk Assessment Mode	Factors Increasing Travel Risk
Itinerary and purpose of travel	
Place factors	
Socioeconomic level	Developing country
Accommodations	Local standard
Locale	Rural
Time factors	
Duration of stay	Prolonged
Season	Adverse weather or crowds
Mode of travel	By air, for heart or lung disease
	By ship, for food-borne disease
Direction of air travel	East or west, for jet lag
	North or south, for climate change
Personal and family health history	
Personal health factors	
Immunization status	Incomplete (Table 4)
Allergies or pregnancy	May prevent indicated prophylaxis
Chronic diseases	Diabetes, debility, immune deficit
Occupational plans	Medical; or village-level work
Lifestyle	Risk-seeking
Adaptability	Rigid or easily stressed

implications for life-cycle change and continuity of care.

ASSESSING RISK AND MEANING IN THE LIFE-CYCLE CONTEXT

Because of their clinical knowledge of each family member, family physicians are able to make an individualized epidemiologic assessment of travel risks based on the classic triad of place, time, and person (Table 1): Where? When and for how long? With whom? Reviewing the journey's proposed itinerary promotes specific appraisal of infectious and physical agents, environmental influences, and host-specific clinical conditions in the patient that determine relative risk and thus specific advice. For example, a diabetic traveling east by air should increase his insulin dose by 25 percent for each six time zone changes; going west, he should decrease it by 25 percent.[5]

Rarely explored in travel medicine but potentially the most vital element of all is the question, "Why?" What are the underlying, not merely the obvious (eg, vacation, job change), reasons? The answer to this question, in light of the patient's age, may be a key to the potential meaning of the journey. This meaning in turn may be conditioned by the traveler's position in the family constellation as well as by the family's life-cycle stage (Table 2). Age will influence risk for certain diseases[6] as well as immunization needs and precautions (eg, infancy, pregnancy). The life-cycle stage of the family may well determine how many and which of its members are about to travel, and thus the potential for unified growth through the experience. Late adolescents or single young adults seeking new identity and adventure encounter specific and perhaps increased risks. North Americans of any age, however, need to know that their greatest mortality risk is from automobile accidents, which occur in the developing countries at a rate ten times as high per passenger mile as in developed nations. If they are going overseas to live and work, couples in early or middle adulthood may have a longer commitment in time, more stress in role change, and a larger career and financial risk than travelers in other family life-cycle stages. In any given country risks will vary widely depending on work and lifestyle. Children raised in two cultures may relate well to both—or to neither. Older travelers, now likely in an "empty nest" stage of the family cycle, may well view the excursion as a reward, the culmination of long years of sacrificial work to achieve financial security. With this may come high, perhaps unrealistic, expectations of the experience.

Travel and change are inseparable. A fair proportion of the 43 life events on the classic Holmes and Rahe scale[7] and the 20 items on the new Feel Bad scale for children[8] imply travel or relocation as either cause or result. Families should consider postponing journeys that may increase a high level of recent life changes, especially those with negative meanings. Perceptive counsel by a physician who knows the family's coping style, however, can help travelers minimize the culture shock of massive sudden change in this country or abroad.

CONTINUITY OF CARE

Guided by a comprehensive risk assessment for each traveling patient in the family, the family physician should plan for continuity of care (Table 3). Ideally, emporiatric planning begins with this risk assessment at least six weeks before the journey starts. This scheduling allows time to complete immunizations requiring a series of injections and time to work with travel agents, whose visa and accommodation advice is usually more accurate than is their emporiatric expertise.[9] All physicians and travel agents can keep current by purchasing each annual edition of the CDC *Health Information for International Travel* and asking CDC to place their names on the mailing list for the free biweekly "Blue Sheet" (Appendix).

When six weeks are not available, or when no immunization series is needed, virtually all pretravel health measures can be compressed into the principal office visit (Table 3), preferably no later than two

TABLE 2. POTENTIAL SIGNIFICANCE AND SPECIFIC RISKS OF TRAVEL AT VARIOUS FAMILY LIFE-CYCLE STAGES

Family Life-Cycle Stage	Meaning of Travel	Specific Health Risks or Issues
Late adolescence	Adventure; pulling up roots	Venereal disease, accidents, general risk-taking lifestyle
Family formation	New, cross-cultural identity	Cross-cultural marital tension
Family growth and launching (early and middle adulthood)	Generativity Career advancement	Obstetrical and occupational risks (if prolonged stay)
Childhood	Cultural identity issues	Alimentary parasites School and behavioral problems
Empty nest and later (late adulthood)	Ego integrity; reward	Acute cardiovascular or chronic handicapping disease
All stages	Life-change events that motivate journey	Illness in next two years; "culture shock"; depression

TABLE 3. CONTINUITY OF CARE FOR TRAVELERS

Before-Travel Physician Visits

1. First visit (6 to 8 weeks before departure, if possible)
   Assess travel risk, life changes, meaning
   Begin any immunizations requiring series
2. Principal office visit (two weeks before departure)
   Complete immunizations, travel counseling; begin antimalarials
   Supply prescriptions for regular and travel-related medications and copy of medical problem list, blood type
   Schedule after-travel visit
3. If hepatitis A risk, give immune globulin day before departure (nurse visit, or at principal visit if no live vaccines are used)

During Travel (Counsel at principal visit)

1. Take antimalarials, continue 6 to 8 weeks after return; precautions on food, water, vectors, automobile safety; extra eyeglasses
2. Provide medical care information from physicians listed with IAMAT,* 736 Center St, Lewiston, NY 14092, (716) 754-4883; obtain list before travel
3. Provide medical evacuation information: NEAR,* 1900 N. MacArthur Blvd, Oklahoma City, OK 73127; (800) 654-6700
4. Be prepared to alter travel plans en route

After-Travel (6 to 8 weeks) Physician Visit

1. Assess any illness since pretravel visit, especially fever, diarrhea, weight loss
   Update problem list; notify health department of any active reportable disease; for more consultation on "tropical" disease or drugs, call your state health department, which can utilize the Parasitic Disease Hotline
2. Determine need for primaquine: 15 mg base each day for 14 days only if patient has had heavy Plasmodium vivax or P ovale exposure and is not glucose-6-phosphate dehydrogenase deficient
3. Assess tuberculosis status with repeat PPD for those at high risk (eg, medical personnel)
4. Determine need for complete blood count (eosinophils), serologic or stool examination for parasitic disease
5. Explore life changes and meaning of completed journey to family, individual
6. Schedule timing of next visit in maintaining continuity of care

Or other agencies listed in Health Information for International Travel

weeks before departure. All indicated immunizations for quarantinable or cosmopolitan diseases (Table 4), as well as typhoid boosters or tuberculin testing, can be completed on this one visit, if necessary, without loss of immunogenicity.[10] Patient discomfort and side effects may be a limiting factor, however. Live virus vaccines not given on the same day should theoretically be given at least one month apart. A required yellow fever vaccine may necessitate coordinating schedules with official vaccination centers, often sponsored by public health departments or university medical centers, as it is often available only at these agencies. Immune globulin, which is indicated for travel away from usual tourist accommodations or of greater than three months' duration, should be given the day before departure so as not to blunt the full immune response to prior live vaccines, though it apparently does not block the response to oral polio or yellow fever vaccines.[10] Travelers whose risk assessment indicates a specific need for other measures, eg, rabies or hepatitis B immunization (Table 4), may require three or more visits.

Prophylaxis and counseling for nonimmunizable diseases may be the most important aspect of this

TABLE 4. PREVENTION OF INFECTIOUS DISEASE IN INTERNATIONAL TRAVELERS AND THOSE TRAVELERS AT SPECIFIC RISK

Consider for All International Travelers		
IMMUNIZABLE		
Quarantinable		
Cholera	0.2 mL intradermal (or 0.5 mL subcutaneous); valid 6 months	50% effective for 3 months, but often legally required
Yellow Fever	0.5 mL subcutaneous; valid 10 years	Endemic areas (Panama, northern South America, tropical Africa)
Plague	1.0 mL, then 0.2 mL 3 months later	No countries require immunization; give only to very high risk persons
Cosmopolitan		
Tetanus/Diphtheria	T/D 0.5 mL every 10 years	Age 14 years and over (assuming preschool vaccinations for diptheria, pertussis and tetanus are complete)
Poliomyelitis	Trivalent oral polio vaccine	Booster for fully immunized adults only; the inactivated (Salk) polio vaccine series for most other adults (see polio reference in Appendix)
Measles, mumps, rubella	0.5 mL combined vaccine	Assure immunity by titer, history of disease, or immunization
Pneumococcus	0.5 mL once	Use USA indications
Influenza	0.5 mL/yr	Use USA indications
NONIMMUNIZABLE		
Malaria	Chloroquine 300 mg (base) weekly (see text for primaquine indications); repellants and barriers	Add Fansidar (500 mg sulfadoxine with 25 mg pyrimethamine) weekly in some areas with resistant Plasmodium falciparum (see text and reference 13 for Fansidar precautions)
Traveler's diarrhea	Careful food, ice selection; boiled or iodine-treated water; bismuth subsalicylate 60 mL or two 300 mg tablets four times each day	Early treatment: 1. Oral rehydration (all cases) and 2. Bismuth subsalicylate 8 doses 60 mL every 30 min, or 3. Co-trimoxazole (trimethoprim 800 mg, sulfamethoxazole 160 mg) twice a day for 5 days
Amoeba, Giardia; alimentary helminths	Food and water precautions as noted above	Post-travel stool test if exposure is high
Consider for Travelers at Specific Risk		
IMMUNIZABLE		
Hepatitis A	Immune globulin 2 mL intramuscularly gives 3-month protection; 5 mL gives 6-month protection	Areas of poor sanitation, nontourist routes Child dose: 0.02 mL/kg (3 months); 0.06 mL/kg (6 months)
Hepatitis B	1.0 mL intramuscularly (3 doses; start 6 months before principal office visit) in arm, not buttock	If sexual or blood-product exposure in high-carrier rate countries or intimate household contact
Typhoid Fever	0.5 mL, 2 doses 4 weeks apart; booster 0.1 mL intradermal every 3 years	Same indications as for hepatitis A prevention; 70 to 90% effective
Rabies	HDCV 1.0 mL intramuscularly (3 doses; start 3 to 4 weeks before principal visit)	If more than one month of village or occupational exposure; efficacy of 0.1 mL intradermal dose under question
Tuberculosis	PPD before and 8 weeks after trip Isoniazid as per USA indications	BCG efficacy doubtful; be aware of PPD "boost phenomenon" if not tested in several years
Leprosy	BCG efficacy doubtful	No concern to travelers
Meningococcus	1 dose; length of immunity unknown	Prolonged or intimate exposure in epidemic areas of African Sahel, Brazil, India, Nepal
Typhus (louse-borne)	Vaccine no longer made in USA	No US tourist cases in 30 years; tetracycline treatment effective
NONIMMUNIZABLE		
Schistosomiasis; leptospirosis	Avoid fresh-water swimming in endemic areas	Brisk toweling if exposed reduces risk of schistosomiasis
Dengue, other arboviruses; trypanosomiases; filaraises	Avoid insect vectors; use protective clothing, screens, repellents	Endemic areas widespread but well-demarcated by ranges of vector species
Anthrax, brucella	Avoid hides, raw milk, or cheese	High risk: Haiti hides; Spain, Mexico cheese Anthrax vaccine for veterinarians

**See references 10-18 and those in Appendix for precautions and atypical situations*

principal office visit. Despite 2,575 cases of malaria in Americans traveling overseas[11] between 1973 and 1983, one study showed that only 15 percent of travelers to Central America who had consulted a physician were provided with malaria chemoprophylaxis.[12] With the increasing range of chloroquine-resistant Plasmodium falciparum (CRPF) malaria, family physicians should rely on the latest information from CDC[10,11,13] as updated by local health departments or the *Morbidity and Mortality Weekly Report* or the "Blue Sheet." The fixed combination tablet of sulfadoxine and pyrimethamine (Fansidar) should be taken weekly with chloroquine (Table 4) for trips of greater than three weeks' duration in East Africa or malarious islands in Oceania. Advise travelers to discontinue Fansidar if they develop any mucous membrane or skin changes such as an itch, rash, sore throat, or genital lesions.[13] Because weekly Fansidar has been implicated in severe mucocutaneous reactions and several deaths, travelers on briefer expeditions should be given three tablets of Fansidar to take as a single-dose presumptive treatment in the event of a febrile illness. Fortunately, no adverse reactions have occurred with single-dose treatment. Travelers to other CRPF areas, especially in South America and Asia, are at less risk and should take chloroquine only, adding weekly Fansidar only if extensive nighttime exposure in rural areas is anticipated. Since pyrimethamine is teratogenic and sulfadoxine may induce neonatal jaundice, Fansidar is contraindicated in pregnancy and in children aged under 2 months. Pregnant women should avoid travel to CRPF regions.[10,11] Amodiaquine should not be used; it can cause fatal agranolocytosis (see Appendix).

Since it affects 30 to 50 percent of travelers to less-developed countries, traveler's diarrhea should be on all pretravel counseling agendas. As a rule, neither its prevention nor treatment requires medications. Commonsense measures for food and drink are the most effective prevention; oral rehydration with palatable, easily made solutions[10] are the cornerstone of treatment. Pamphlets and wallet-size cards, such as those used by the New Mexico Health Department (Appendix), summarizing prevention and treatment in lay language serve as ideal counseling guides, which travelers can then carry with them.

Medical measures for traveler's diarrhea remain imperfect; yet some consensus is developing (Table 4). Bismuth subsalicylate 60 mL or two 300-mg tablets four times daily is an effective preventive[14,15]; however, because of its salicylate content, it should not be used regularly by children aged less than 3 years or by anticoagulated patients.[16] To supplement oral rehydration, early short-term treatment with bismuth subsalicylate[17] or co-trimoxazole[18] is effective. Sulfa-allergic travelers can use doxycycline, although many shigellae are resistant, and tetracyclines are contraindicated in pregnant women or children aged under 8 years. Physicians may wish to prescibe a supply of co-trimoxazole as they refill patients' regular medications and recommend other contents for the family's medical travel kit.

To assure continuity of care on the trip, the family physician should give each traveling family a list noting their medical problems, the family physician's own telephone number, and the names of English-speaking physicians and medical evacuation sources in each country to be visited (Table 3). Patients should be reminded to take malaria prophylaxis until their scheduled after-travel visit and to tape the appointment card to their home refrigerator. Finally, to place risk in perspective, counseling should emphasize that automobile trauma is a much greater mortality cause than all infectious diseases combined.

Unless there is intercurrent illness, eight weeks after return is the best time for the multipurpose post-travel assessment (Table 3), the extent of which is determined by a pertinent review of systems and of the risks actually encountered. Detection of travel-acquired tuberculin reactivity or intestinal parasite ova in stool specimens is more likely at eight weeks than soon after the trip. If, because of heavy mosquito exposure, a two-week primiquine course is advised to eradicate exoerythrocytic malaria, the previous weekly dose of chloroquine (and Fansidar, if taken) should be continued for these two extra weeks. Families must be informed that since some "tropical" diseases (eg, schistosomiasis, filariasis, leishmaniasis, and trypanosomiasis) may not be clinically apparent until months or years later, they should always volunteer their travel history. If an exotic or any notifiable infectious illness is detected, it should be reported by way of the health department to the CDC, which maintains a hot line to provide consultation and antiparasitic drugs not regularly available by prescription.

Returning travelers are more likely to have new adventures to recount rather than new ailments. The family physician can find these stories rewarding, detecting clues for the significance the journey has taken on for each family member. Ranging from new perspectives on one's usual role to definitive decisions about the future, these new meanings in turn may influence the family's future biopyschosocial health. In fact, the many analogies in daily language between travel and the life cycle, eg, "life's journey," "march of time," "crossroads," and "passages," reveal their inherent linkages.

EMPORIATRICS IN FAMILY MEDICINE EDUCATION

If the family physician is a logical source of emporiatric care for travelers, then family medicine educators need to exploit the many available opportunities for teaching, research, and patient care in travelers' health. In keeping with the competence priorities approach,[19] a three-level family medicine emporiatric content is suggested in Table 5. Serving as a curriculum guide, such an outline implies, for example,

TABLE 5. FAMILY MEDICINE CONTENT: EMPORIATRICS

Definitive Care

Behavior: Travel in life-stage context; patient awareness of travel risks

Concepts: Family function in stress of change; "culture shock"; epidemiology of risk assessment and infectious disease; immunization principles; geographic and environmental medicine

Skills: Family travel counseling and "debriefing"; cosmopolitan disease immunization; chemoprophylaxis of malaria and diarrhea; environmental risk counseling; evaluation of fever, diarrhea, fatigue; biopsy

Shared Care with Health Department and Infectious Disease Consultant

Behavior: Partnership attitude toward health department, applied anthropologists, other counselors

Concepts: Health department resources and responsibilities in travel medicine and continuing medical education; basic laboratory parasitology; prevention and diagnosis of noncosmopolitan international diseases

Consultation skills: Negotiation and consultation for special preventive (eg, yellow fever vaccination), diagnostic, or treatment procedures; infectious disease reporting; contact investigation

Supportive Care

Behavior: Decision with family to refer to infectious disease or other consultant

Concepts: Advanced laboratory diagnosis; care of life-threatening (eg, chloroquine-resistant malaria) or complex (eg, cysticercosis) "tropical" disease or severe psychiatric crisis

Referral skills: Maintenance of quality assurance Family counseling and continuity of care of antecedent problems

that all family physicians should be able to offer definitive services to all travelers in matters dealt with in Tables 1, 2, 3 and 4, while sharing responsibility for special situations (Table 4) with public health or infectious disease consultants.

A core bibliography (Appendix), continuously updated, serves as a resource library for faculty, residents, and prospective travelers. Since there is a major need for continuing medical education in emporiatrics for all primary care physicians and especially for travel agencies,[3] family physicians should join their health departments in this role in their medical schools, medical societies, and communities.

As with many other problems for which medical care has been fragmented, there are few reliable prospective data on the incidence, and therefore the risk, of various emporiatric illnesses in unselected populations of travelers. A parallel paucity exists regarding the effects of major changes of residence on comprehensive health. Multicenter studies by family medicine programs could meet these needs. As family physicians and travelers both grow in numbers, the natural affinities between them outlined in this paper can bring them together.

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APPENDIX
TRAVEL MEDICINE FOR FAMILY PRACTICE: A CORE BIBLIOGRAPHY

PRETRAVEL ASSESSMENT AND PROPHYLAXIS

GENERAL

***Health Information for International Travel 1985,** DHHS publication No. (CDC) 017-023-00174-4 ($4.75 from US Govt Printing Office, Washington, DC 20402 or 202/783-3238. Order annually. The single most valuable source on pretravel and travel advice)

***Summary of Health Information for International Travel.** Biweekly. DHHS publication. Centers for Disease Control, Atlanta, GA 30333 (Known as the "Blue Sheet." Write to CDC, Atlanta, GA 30333 to be placed on free mailing list; issued biweekly to update the annual Health Information for International Travel)

***Morbidity and Mortality Weekly Report,** Public Health Service, Centers for Disease Control, Atlanta, GA 30333. (The authoritative MMWR, now available for about $20 per year from MMS Publications, PO Box 9120, Waltham, MA 02254; timely updates and case reports)

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For most diseases listed below, also see latest annual CDC Health Information for International Travel. (Order of references below follows categories in Table 4.)

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Rabies

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Systemic allergic reactions following HDCV. MMWR 1984; 33:185-187

Hepatitis A and B

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Tuberculosis

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