Travel Medicine 101: Pre-Travel Consultation

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September 7th, 2018
Travel Medicine

- Aim of pre-travel consultation is to prevent disease and injury by providing travelers with education, vaccinations, medical supplies, and resources to cope with problems during their journey
World Tourism

UNWTO Tourism Towards 2030: Actual trend and forecast 1950-2030

- Actual
- Forecasts

- Africa
- Middle East
- Americas
- Asia and the Pacific
- Europe

International Tourist Arrivals received (million)


940 mn
1.4 bn
1.8 bn

UNWTO Tourism Highlights, 2015 Edition
U.S. Residents Traveling Abroad

*ITA, includes travel to Canada and Mexico

Number of Travelers (millions)

Year


*ITA, includes travel to Canada and Mexico
Where Do U.S. Residents Travel?

US Traveler's Destinations 2017
n = 87,703,442

Mexico | 40.00%
Canada | 15.00%
Caribbean | 10.00%
Central America | 5.00%
South America | 5.00%
Europe | 15.00%
Asia | 5.00%
Middle East | 2.00%
Africa | 1.00%
Oceania | 1.00%

US National Tourism and Trade Office
https://travel.trade.gov/outreachpages/outbound.general_information.outbound_overview.asp
Who is at Risk?

- Tourists
- Business Travelers
- Expatriates visiting friends and relatives
- Missionaries
- Students
- Military
VFRs: Visiting Friends and Relatives

- Foreign-born increased 57% since 1990 from 19.8 million to 31.1 million\(^1\)
- 20% of US population are first- or second-generation immigrants
- VFRs comprised \(~46\%\) of US international air travelers in 2004\(^3\)

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\(^3\) 2004 Profile of U. S. Resident Travelers Visiting Overseas Destinations Reported From: Survey of International Air Travelers, Office of travel and tourism industries, USDOC
Travelers’ Health Risks

Of 100,000 travelers to a developing country for 1 month:

- 50,000 will develop some health problem
- 8,000 will see a physician
- 5,000 will be confined to bed
- 1,100 will be incapacitated in their work
- 300 will be admitted to hospital
- 50 will be air evacuated
- 1 will die

Steffen R et al. J Infect Dis 1987; 156:84-91
Deaths Related to International Travel


N = 2463
Injury Deaths and International Travel

Motor Vehicle
Drowning
Air Crash
Homicide/Suicide
Poisoning
Other

N = 601

Infectious Disease Risks to the Traveler

- Malaria
- Diarrhea
- Leishmaniasis
- Rabies
- Dengue
- Meningococcal Meningitis
- Schistosomiasis
- Tuberculosis
- Leptospirosis
- Polio
- Yellow Fever
- Measles
- JEV
- HIV
- Hepatitis
- Zika
- Chikungunya
Preparing the Traveler

**General Principles**

- Traveler needs to be aware of the risk of travel and the availability of advice before starting journey
- Preparation is not easy and takes time
- Prevention strategies and interventions must be individualized
- Education is as vital as immunizations
- Structured approach is necessary
- Provide written instruction in layman’s language
Preparing the Traveler

- Three main steps
  - Assess traveler dependent factors and itinerary
  - Select and provide vaccines, malaria prophylaxis, and travelers diarrhea precautions
  - Provide education about prevention and self treatment of travel-related diseases
# Preparing the Traveler

<table>
<thead>
<tr>
<th>Risk Assessment</th>
<th>Standard In-Office Interventions</th>
<th>Focused Education before the Trip</th>
</tr>
</thead>
</table>
| Medical history, including medications, disabilities, immune status, immunizations, surgeries, allergies, and pregnancy or breast-feeding | Administration of immunizations  
  Updating of routine vaccines — MMR, Tdap, pneumococcal, varicella, influenza  
  Routine travel vaccines — hepatitis A, typhoid, hepatitis B  
  Special travel vaccines — yellow fever, rabies, polio, meningococcal, Japanese encephalitis, cholera, tickborne encephalitis | Vectorborne diseases (if risk)  
  Personal protection measures for malaria, dengue, chikungunya, Zika virus infection, leishmaniasis, rickettsial disease, sleeping sickness |
| Prior travel experience | **Malaria chemoprophylaxis (if risk)**  
  Individualize to itinerary and patient | Other travel-related illnesses (as applicable)  
  Altitude illness  
  Travelers’ thrombosis  
  Motor vehicle injury  
  Bloodborne and sexually transmitted infections  
 Swimming, water exposure, and marine hazards  
 Transportation-associated illnesses  
 Respiratory infection and tuberculosis  
 Rabies and animal-associated illness  
 Skin conditions and wounds |
| Specific itinerary, including regions, season, and dates | **Travelers’ diarrhea**  
  Food and water precautions  
  Oral rehydration and use of loperamide and bismuth  
  Antibiotic self-treatment options for severe diarrhea  
  Prophylaxis with bismuth or antibiotic (only if high risk) | **Medical kit and medical care abroad**  
  Personal health kit  
  Available medical facilities  
  Evacuation insurance; supplemental health insurance |
| Activities (e.g., adventure travel and events involving mass gatherings) |                                                                 |                                                                        |
| Type of accommodations  |                                                                 |                                                                        |
| Travelers’ risk tolerance |                                                                 |                                                                        |
| Financial challenges    |                                                                 |                                                                        |

Assess Traveler Dependant Factors

- Age
- Underlying illness
  - CV, Pulmonary, Immunosuppressive, Bleeding disorders, Seizures, DM, Psychiatric
- Current medications
- Allergies (Medication and Environmental)
- Pregnant or contemplating pregnancy
- Past vaccination history
- Level of aversion to risk
- Potential financial limitations
Analyzing the Itinerary

- Exact Itinerary including specific cities/regions to be visited
  - Urban vs. Rural
- Dates of travel to assess risk of seasonal diseases
- Length of stay
- Purpose of trip / Risk of exposure
  - Blood/body fluid, adventure or extensive outdoor exposure
- Type of accommodations
Immunizations

- Choice of Vaccines
  - Must be individualized
  - Risk of exposure given the chosen itinerary
  - Severity of disease if acquired
  - Risk of the vaccine itself
  - Underlying illness of patient
  - Cost
  - Availability
# Immunizations to Consider for Adult Travelers

<table>
<thead>
<tr>
<th>Routine</th>
<th>Travel related</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphtheria*</td>
<td>Hepatitis A</td>
</tr>
<tr>
<td>Tetanus*</td>
<td>Hepatitis B</td>
</tr>
<tr>
<td>Pertussis*</td>
<td>Typhoid</td>
</tr>
<tr>
<td>Measles +</td>
<td>Rabies</td>
</tr>
<tr>
<td>Mumps +</td>
<td>Meningococcal disease</td>
</tr>
<tr>
<td>Rubella +</td>
<td>Polio</td>
</tr>
<tr>
<td>Varicella</td>
<td>Japanese encephalitis</td>
</tr>
<tr>
<td>Pneumocococcus</td>
<td>Yellow Fever</td>
</tr>
<tr>
<td>Influenza</td>
<td>Cholera</td>
</tr>
</tbody>
</table>

* Td or Tdap
+ MMR
Immunizations – Yellow Fever

- YF found only in South America and parts of Africa
- Vaccination with official certificate required for entry into certain countries in endemic area
- Healthy adult travelers to endemic areas should be vaccinated
- Due to rare but serious side effects, those not at risk of exposure should not be vaccinated
  - YEL-AND
  - YEL-AVD
Immunizations – Yellow Fever

- Only available at certified clinics
- Vaccine given at least 10 days before travel
- Immunity is probably lifelong, but certificate only good for 10 years
- Contraindicated in pregnancy, immunosuppressed, egg allergy, or infants <9mo
- Live Attenuated vaccine
- Single SC dose, booster in 10 years*
Immunizations - Meningococcus

- Recommended for travel to “Meningitis Belt of Africa” esp dry season of Dec to June.
- Required to obtain Saudi Arabian visas for Hajj and Umra pilgrimages
- Quadravalent polysaccharide vaccine (ACYW 135)
- Single SC dose w/ 3-5 year booster
Immunizations – Hepatitis A

- Risk is 3 in 1000 per month of standard tourist itineraries
- Increases sevenfold for adventure travelers or journeys off traditional tourist routes
- Individuals born in the developing world or who previously lived in an endemic country may be immune and serologic testing can be considered
- Vaccine is 80-94% effective within 2 weeks after first dose
- Killed Virus Vaccine
- Schedule is 0 and 6-12 months
- Can be given as combined vaccine with Hep B
Immunizations – Hepatitis B

- Sexual/Parenteral transmission
- Nonvaccinated travelers with standard indications
- Long stay travelers in mod-high risk areas
- Adventure travelers
- Those with underlying medical conditions
- Recombinant viral antigen
- 0, 1, and 6 months
- Accelerated schedules:
  - 0, 1, 2, +12 months
  - 0, 1, 3 weeks, +12 months
Immunizations – Hepatitis A/B

- Combination Hep A/B Vaccine
  - Fewer shots
  - Combination of monovalent preparations
  - Given at 0, 1, 6 months
  - Accelerated Schedule: 0, 1, 3 weeks, +12 months
Immunizations - Typhoid

- Food Borne illness
- Risk increases with trip duration, lodging or eating with locals, travel off usual tourist routes
- Vaccine indicated for Indian subcontinent, W and N Africa, and S. America
- Vaccine only 53-72% protective
- Must still follow food/water precautions
- Capsular polysaccharide is single IM dose w/ 2-3 yr booster
- Live attenuated oral vaccine given 0, 2, 4, 6 days w/ 5yr booster
Immunizations - Rabies

- **Pre-exposure vaccination series**
  - Travel to endemic areas for longer durations
  - Areas where adequate post-exposure vaccine/IG is questionable
  - Outdoor activity expected
    - Children
    - Adventure travelers
    - Backpackers/hikers/bikers/spelunkers
    - Business travelers who plan to run outdoors during trip
Immunization – Rabies

- Inactivated viral cell culture vaccine
- Given at 0, 7, 21-28 days
- With any exposure
  - Wound should be cleaned with soapy water
  - Medical care sought for two more doses of vaccine (0 and 3 days) after exposure
Malaria

- Most important disease for travelers to avoid
- 300-500 million people infected worldwide
- 2 million deaths yearly
- Risk varies based on destination factors
- Largely preventable
  - Chemoprophylaxis
  - Personal Protective measures
Malaria

- Chemoprophylaxis
  - Malaria deaths often due to inappropriate meds or nonadherence
  - 84% of US malaria cases took no or inappropriate prophylaxis
  - 81% in UK and 97% in Canada
  - Confusion, poor advice, difficult regimen, side effects, personal beliefs
Malaria - Chemoprophylaxis

- Goal is to prevent death from Falciparum malaria
- Medications kill asexual blood stage
- Prophylaxis started before exposure begins and continues for set period after return
- Choice of drug
  - Duration of journey
  - Resistance patterns
  - Potential adverse effects
  - Costs
Figure 1. Areas Where Malaria Is Endemic.
Data are from the World Health Organization and from the Centers for Disease Control and Prevention.5,6
Table 1. Relative Risk of Malaria among Travelers, 2000 through 2002.*

<table>
<thead>
<tr>
<th>Region Visited</th>
<th>Relative Risk (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very-low-risk area†</td>
<td>1.0</td>
</tr>
<tr>
<td>Caribbean</td>
<td>3.8 (1.9–7.5)</td>
</tr>
<tr>
<td>North Africa</td>
<td>6.9 (3.6–13.3)</td>
</tr>
<tr>
<td>South America</td>
<td>8.3 (4.9–13.9)</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>11.5 (8.3–15.9)</td>
</tr>
<tr>
<td>Central America</td>
<td>37.8 (24.0–59.6)</td>
</tr>
<tr>
<td>South Asia</td>
<td>53.8 (37.4–77.4)</td>
</tr>
<tr>
<td>Oceania</td>
<td>76.7 (50.8–115.9)</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>207.6 (164.7–261.8)</td>
</tr>
</tbody>
</table>

* Approximate relative risks were based on 1140 cases of malaria among travelers in the GeoSentinel database, with areas visited as numerators and tourist arrivals in that region (according to World Tourism Organization data) as estimates for denominators. Adapted from Leder et al.¹²
† Very-low-risk areas were Europe, Northeast Asia, Australia, New Zealand, North America, and the Middle East.
Malaria - Chemoprophylaxis

- Chloroquine sensitive areas
  - Chloroquine drug of choice – 500mg/week starting one week before and continuing 4 weeks after return

- Chloroquine-resistant areas
  - Mefloquine 250mg weekly starting one week before and continuing for 4 weeks after return
  - Atovaquone/Proguanil 250/100mg daily starting one week before and continue for 7 days after return
  - Doxycycline 100mg daily starting one day before and continuing for 4 weeks after return

- Mefloquine-resistant areas
Vector Precautions

- Covering exposed skin
- Insect repellent containing DEET 25 – 50%
- Treatment of outer clothing with permethrin
- Use of permethrin-impregnated bed net
- Use of insect screens over open windows
- Air conditioned rooms
- Use of aerosol insecticide indoors
- Use of pyrethroid coils outdoors
- Inspection for ticks
Zika Virus
Chikungunya Virus

Current or previous local transmission of chikungunya virus
Travelers Diarrhea

- 3 or more unformed stools in 24 hours
  - +/- cramps, fevers, nausea, or vomiting
- Affects 10-40% of travelers to developing areas
- PPI may increase risk
- Usually from food rather than water
- More common in first two weeks, lasting ~4 days
- ETEC, EAEC, Campylobacter, Shigella, Salmonella
- Viral causes: Norwalk/Rotavirus
- Rarely protozoa and helminths
Travelers Diarrhea - Prevention

- Drink only bottled or boiled water or carbonated beverages
- Consume piping hot, freshly cooked food or packaged/processed foods
- Peel thick skinned fruits yourself and avoid thin skinned fruits, unpasteurized juices
- Avoid salads, buffets
- Avoid unpasteurized dairy
- Avoid raw seafood
Travelers Diarrhea – Self Treatment

- **Antibiotics**
  - Fluoroquinolones (cipro, levo): 500 mg once or daily x 3 days
  - Azithromycin: 1g once or 500mg daily x 3 days
    - Only option in SE Asia, India/Nepal
  - Beware of resistance

- **Others**
  - Loperamide
  - Bismuth Subsalicylate
  - Diphenoxylate/atropine
  - WHO oral rehydration salts
  - Bland diet
Panel 6: **Self-treatment approach to traveller’s diarrhoea**

<table>
<thead>
<tr>
<th>When and how to treat</th>
<th>Choose</th>
<th>Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild: 1–2 stools/24 h with mild or no symptoms</td>
<td>No treatment</td>
<td>Loperamide</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bismuth subsalicylate</td>
</tr>
<tr>
<td>Moderate: &gt;2 stools/24 h with:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No distressing symptoms</td>
<td></td>
<td>Loperamide or bismuth subsalicylate and single dose antibiotic if worsening</td>
</tr>
<tr>
<td>Distressing symptoms</td>
<td></td>
<td>Loperamide and antibiotic. Reassess in 12–24 h: if resolved, stop antibiotic, otherwise repeat up to 3 days</td>
</tr>
<tr>
<td>Severe: &gt;6 stools/24 h with fever or bloody stools</td>
<td>Antibiotic for 1–3 days. Seek medical care if unable to keep down fluids or food, prostration, or abdominal pain</td>
<td></td>
</tr>
</tbody>
</table>
Environmental Precautions

- Air Travel
- Jet Lag
- Sun Protection
- Extreme Heat and Cold
  - dehydration, heat stroke
  - hypothermia, frostbite
- Altitude
- Water recreation
  - Drowning, boating & diving accidents
  - Risk of schistosomiasis or leptospirosis
  - Biological and chemical contamination
Bloodborne and STD Precautions

- Prevalence of
  - STDs
  - Hepatitis B
  - Hepatitis C
  - HIV

- Unprotected sexual activity
- Commercial sex workers
- Tattooing and body piercing
- Auto accidents
- Blood products
- Dental and surgical procedures
Animal Precautions

- Animal avoidance
- Rabies
  - Specific animal threats
  - Medical evaluation of bites/scratches
  - Post exposure immunization and immunoglobulin
- Envenomations
  - Snakes, scorpions, spiders
  - Maritime animals
Injury and Crime

- **Vehicles**
  - Risk of road and pedestrian accidents
  - Night travel
  - Seat belts and car seats
- **Use of drugs and alcohol**
- **Understanding local crime risks**
  - Scam awareness
  - Situational awareness
  - Location avoidance
Travel Emergency Kit

- Copy of medical records and extra pair of glasses
- Prescription medications
- Over-the-counter medicines and supplies
  - Analgesics
  - Decongestant, cold medicine, cough suppressant
  - Antibiotic/antifungal/hydrocortisone creams
  - Pepto-Bismol tablets, antacid
  - Band-Aids, gauze bandages, tape, Ace wraps
  - Insect repellant, sunscreen, lip balm
  - Tweezers, scissors, thermometer
- Contact Numbers
Travel Health Resources

- CDC Travelers’ Health Website
  - www.cdc.gov/travel

- World Health Organization
  - www.who.int/int

- State Department
  - travel.state.gov

- International Society of Travel Medicine
  - www.istm.org

- Health Information for International Travel
  - CDC “Yellow Book”

- International Travel and Health
  - WHO “Green Book”

- Promed - promedmail.org
Travelers' Health Website
www.cdc.gov/travel

Travelers' Health

Select by Country | Select by Region | Yellow Book

Type FIRST Letter of Country here

View a complete list of destinations by country
Select travel health information by your destination countries: What to know before you go

Specific Topics:

- **Destinations**
  Health information for specific destinations

- **Vaccinations**

- **Diseases**

- **Insect and Arthropod Protection**

- **Travel Medicine Clinics**

- **Yellow Fever Vaccination Clinics**

- **2005-2006 Yellow Book**

- **New! Avian Influenza & Travel**

Announcements
(No announcements)

About This Site

Frequently Asked Questions

Travel Notices

**Travel Health Warnings** (postpone nonessential travel): None

**Travel Health Precautions**: None

Types of Travel Notices

Outbreaks

- **Update**: Malaria, Great Exuma, Bahamas (Updated August 1)
- **Update**: Recent Measles and Mumps Outbreaks (Updated July 28)
- **Plague**, Democratic Republic of the Congo (Released June 28)
- **Update**: Chikungunya Fever: India
Immunizations – Japanese Encephalitis

- Endemic only in uncommonly visited rural areas
- Vaccination recommended for
  - Long stay in endemic rural area
  - Short term travel to endemic rural area with extensive outdoor exposure
  - Short term travel to endemic rural area during ongoing epidemic
- Inactivated viral vaccine given at 0, 28d with booster in 1-2 yrs
- Accelerated course 0, 7 days
Japanese encephalitis, 2001

- All-year transmission
- Seasonal transmission
Immunizations - Other

- **Cholera**
  - 1 sachet orally provides 3-6 months of protection
  - Risk is low for most travelers
  - Inactivated vaccine not approved in US

- **Tick-Borne Encephalitis – Former Soviet Union**
  - Risk is low unless heavy outdoor exposure expected
  - Vaccine not available in US
Cholera Outbreaks 2010-14