Travel Medicine

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International Travel is Increasing

Figure 1 - International tourist arrivals (in millions)

International Travel

• >60 million U.S. residents traveled to foreign countries in 2013
  • Steady increase over last 20 years
  • More varied destinations and activities
  • Increasing travel to low and low-middle income countries

• What are the risks of international travel?
  – Risk of acquiring diseases unique to or more common in destination country
  – Risk of importing disease to US
    • 2009 H1N1 influenza, dengue fever, measles, Zika virus

• Pre-travel health encounter aims to decrease these risks and serves an important public health purpose
Only 46% of travelers to low and low-middle income countries sought health advice of any type prior to departure.

Table 3  Sources of health information among travelers to LLMIC countries who pursued health information prior to departure *

<table>
<thead>
<tr>
<th>Source</th>
<th>All respondents (N = 259)</th>
<th>VFR (N = 35)</th>
<th>Non-VFR (N = 224)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet</td>
<td>110 (43%)</td>
<td>11 (31%)</td>
<td>99 (44%)</td>
</tr>
<tr>
<td>Primary care practitioner†</td>
<td>98 (38%)</td>
<td>20 (57%)</td>
<td>78 (35%)</td>
</tr>
<tr>
<td>Travel medicine specialist</td>
<td>77 (30%)</td>
<td>1 (3%)</td>
<td>76 (34%)</td>
</tr>
<tr>
<td>CDC website</td>
<td>53 (20%)</td>
<td>6 (17%)</td>
<td>47 (21%)</td>
</tr>
<tr>
<td>Travel book</td>
<td>26 (10%)</td>
<td>2 (6%)</td>
<td>24 (11%)</td>
</tr>
<tr>
<td>Travel agent/trip organizer</td>
<td>24 (9%)</td>
<td>1 (3%)</td>
<td>23 (10%)</td>
</tr>
<tr>
<td>Employer</td>
<td>7 (3%)</td>
<td>0</td>
<td>7 (3%)</td>
</tr>
</tbody>
</table>

LLMI = low- or low-middle income; VFR = visiting friends and relatives.

*Survey respondents could select more than one source of health information.
†p < 0.05 for comparison between VFR and other travelers.
Outline (Case-based)

• What comprises the pre-travel medicine consultation?
  – Travel related vaccines
  – Malaria prophylaxis
  – Travelers’ diarrhea
  – Travel advice

• Who requires referral to a travel medicine specialist?
### Key Components of the Pre-travel Consultation

| Assessing the health of the traveler | Medical conditions  
Current medications  
Allergies (medications, foods, vaccine components)  
Previous immunizations |
|---|---|
| Assessing the risk of travel | Destination(s)  
Season  
Duration of stay  
Modes of transportation  
Planned activities  
Accommodations  
Purpose of travel |
| Education | Insect avoidance  
Injury prevention  
Safe food and water  
Self-treatment of diarrhea  
Safe sex practices  
Altitude acclimatization  
Animal avoidance  
Evacuation insurance  
Access to medical care overseas  
Traveling with small children  
Traveling while pregnant or breastfeeding |
| Vaccination | Routine vaccinations  
Required vaccines based on travel destination(s)  
Recommended vaccines based on travel destination(s) |
| Medications | Chemoprophylaxis  
-Malaria  
-Altitude illness  
Self-treatment of specific illnesses  
-Travelers’ diarrhea  
-Altitude illness  
-Jet lag  
-Motion sickness  
-HIV post-exposure prophylaxis  
-Upper respiratory infection |
Case # 1

- A 20 year-old college student is traveling to a rural area outside Monterrey, Mexico for a service project
Case # 1

- A 20 year-old college student is traveling to a rural area outside Monterrey, Mexico
  - History of asthma requiring occasional inhaler use; no hospitalizations since early childhood
  - Service project
  - Six-week trip
  - Sleeping in a church hall with other students
  - Food to be prepared by host family
  - Working on building a new church building alongside members of the local community
Case # 1: What medications would you recommend or prescribe?
Case # 1: What medications would you recommend or prescribe?

• Non-prescription
  – Anti-diarrheal
  – Medical kit for travelers

• Malaria chemoprophylaxis
  – Malaria risk limited to small foci along the borders with Guatemala and Belize

• Empiric self-treatment for travelers’ diarrhea

• Other
  – Alcohol hand sanitizer
  – DEET-containing insect repellant
Food and Waterborne Illness

• Travelers’ diarrhea is the most predictable travel-related illness
• Clinical syndrome that results from a variety of pathogens
• 30-70% of travelers depending on destination
• Most important determinant is travel destination
  – Intermediate risk: Eastern Europe, South Africa, parts of Caribbean
  – High risk: Asia, Middle East, Africa, Mexico, Central and South America
• People who follow the rules still get ill
  – ?poor hygiene at local restaurants
### Pathogens Causing Travelers’ Diarrhea

<table>
<thead>
<tr>
<th>Agent*</th>
<th>Frequency (%)†</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bacteria</strong></td>
<td>50-75</td>
</tr>
<tr>
<td><em>Escherichia coli</em> (enterotoxigenic)</td>
<td>10-45</td>
</tr>
<tr>
<td><em>E coli</em> (enteroaggregative)</td>
<td>5-35</td>
</tr>
<tr>
<td><em>Campylobacter</em></td>
<td>5-25</td>
</tr>
<tr>
<td><em>Salmonella</em></td>
<td>0-15</td>
</tr>
<tr>
<td><em>Shigella</em></td>
<td>0-15</td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td>0-5</td>
</tr>
<tr>
<td><strong>Viruses</strong></td>
<td>0-20</td>
</tr>
<tr>
<td>Noroviruses</td>
<td>0-10</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>0-5</td>
</tr>
<tr>
<td><strong>Parasites</strong></td>
<td>0-10</td>
</tr>
<tr>
<td><em>Giardia intestinalis</em></td>
<td>0-5</td>
</tr>
<tr>
<td><em>Cryptosporidium</em> spp</td>
<td>0-5</td>
</tr>
<tr>
<td><em>Cyclospora cayetanensis</em></td>
<td>&lt;1</td>
</tr>
<tr>
<td><em>Entamoeba histolytica</em></td>
<td>&lt;1</td>
</tr>
<tr>
<td><strong>Acute food poisoning</strong></td>
<td>0-5</td>
</tr>
<tr>
<td><strong>No pathogen identified</strong></td>
<td>10-50</td>
</tr>
</tbody>
</table>

*Coinfection with multiple pathogens occurs in 10-15% of cases.
†Frequency varies between travel destination, setting, and season.

Hill & Ryan, BMJ, 2008
Preventive Measures for Travelers’ Diarrhea

- Food and beverage selection
- Non-antimicrobial drugs
- Prophylactic antibiotics

"In the event you suffer from Montezuma's Revenge, there's a TV in every bathroom."
Preventive Measures for Travelers’ Diarrhea

• Food and beverage selection
  – Freshly cooked
  – Served piping hot
  – Cooked vegetables and peeled fruits
  – Bottled water, sealed beverages, carbonated beverages, alcoholic beverages without ice
Preventive Measures for Travelers’ Diarrhea

• Non-antimicrobial drugs for prophylaxis
  – Bismuth subsalicylate (2 tabs QID)
    • Side effects
    • Salicylate toxicity
  – Probiotics
    • Studies inconclusive

• Prophylactic antibiotics
  – Increasing resistance
  – Rifaximin
Self-Treatment of Travelers’ Diarrhea

- Anti-motility agents (Imodium)
- Oral rehydration therapy
- Empiric self-treatment with an antibiotic directed at bacterial pathogens has been a common approach to travelers’ diarrhea
  – Can limit duration of illness to 6-24 hours
Treatment of Travelers’ Diarrhea: Antibiotics

• Fluoroquinolones have been first-line

• Other choices
  – Azithromycin (note *NEJM* findings)
  – Rifaximin

• Increasing antimicrobial resistance, especially among *Campylobacter* isolates, can limit usefulness of fluoroquinolones in some destinations, especially in Asia

• Risk of MDR bacteria
Risk of MDR Bacteria

Antimicrobials Increase Travelers' Risk of Colonization by Extended-Spectrum Betalactamase-Producing Enterobacteriaceae

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1. Author Affiliations

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Abstract

Background. More than 300 million travelers visit regions with poor hygiene annually. A significant percentage of them become colonized by resistant intestinal bacteria such as extended-spectrum beta-lactamase-producing Enterobacteriaceae (ESBL-PE) and may transmit the strains to others and to medical care settings when they return home. Despite the threats to global healthcare caused by an upsurge in antimicrobial resistance, no effort has been centered on prevention of colonization while traveling.

Methods. Stool samples were collected from 430 Finns before and after traveling outside Scandinavia. All specimens were analyzed for ESBL- and carbapenemase-producing Enterobacteriaceae (CPE). Questionnaires were used to survey volunteers about use of antimicrobials as well as other potential risk factors. The results were subjected to multivariable analysis.

Results. Twenty-one percent (90/430) of the travelers became colonized by ESBL-PE and none by CPE. Geographic region, occurrence of travelers' diarrhea (TD), age, and use of antimicrobial (AB) for TD were identified as independent risk factors predisposing to contracting ESBL-PE. Eleven percent of those in subgroup TD+AB−, 21% in TD+AB+, and 37% in TD+AB− acquired ESBL-PE. The risk proved to be highest in South Asia (46%), 23% became colonized in subgroup TD−AB−, 47% in TD+AB−, and 80% in TD+AB+. In Southeast Asia, the rates were 14%, 37%, and 69%, respectively.
Fluoroquinolones: Black Box

FDA Drug Safety Communication: FDA advises restricting fluoroquinolone antibiotic use for certain uncomplicated infections; warns about disabling side effects that can occur together
Case # 1: What immunizations would you recommend?

- Travel-related
- Routine
Travel-Related Immunizations

- Hepatitis A
- Yellow Fever
- Polio
- Meningococcal
- Typhoid
- Rabies
- Japanese Encephalitis
Travel-Related Immunizations

- **Hepatitis A**
- Yellow Fever
- Polio
- Meningococcal
- **Typhoid**
- Rabies
- Japanese Encephalitis
Hepatitis A

• Most frequent vaccine-preventable illness of travelers
• International travel is the most frequently identified risk factor among individuals infected with HAV in the U.S.
  – 72% of cases associated with travel to Mexico or Central/South America
• Risk varies with living conditions, length of stay and incidence in area visited
Hepatitis A Vaccines

• Two monovalent vaccines (HAVRIX, VAQTA) and a combination HAV/HBV vaccine (TWINRIX) are available
  – TWINRIX can be given on 0-, 1-, 6-month schedule or accelerated 0-, 7- and 21-day schedule with a fourth dose at 1 year
• One dose of monovalent HAV vaccine administered at any time before departure can provide adequate protection for most healthy persons <40 years of age
• For optimal protection, older adults, immunocompromised persons and those with chronic liver disease departing in < 2 weeks should receive initial dose of vaccine along with immune globulin administered at a separate anatomic site
Routine Immunizations

- Influenza
- Pneumococcal
- MMR
- Tdap/Td
- Hepatitis B
- Varicella and shingles
- HPV
- Meningococcal
Routine Immunizations

- Influenza
- Pneumococcal
- MMR
- Tdap/Td
- Hepatitis B
- Varicella and shingles
- HPV
- Meningococcal
Pneumococcal Vaccination

Table 1: Medical conditions or other indications for administration of PCV13, and indications for PPSV23 administration and revaccination for adults 19 years of age or older

<table>
<thead>
<tr>
<th>Risk Group</th>
<th>Underlying Medical Condition</th>
<th>PCV13 Recommended</th>
<th>PPSV23* Recommended</th>
<th>Revaccination at 5 years after first dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunocompetent persons</td>
<td>Chronic heart disease</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chronic lung disease</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diabetes mellitus</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CSF leaks</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cochlear implants</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alcoholism</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chronic liver disease</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cigarette smoking</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Persons with functional or anatomic asplenia</td>
<td>Sickle cell disease/other hemoglobinopathies</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Congenital or acquired asplenia</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Immunocompromised persons</td>
<td>Congenital or acquired immunodeficiencies*</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>HIV infection</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Chronic renal failure</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Nephrotic syndrome</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Leukemia</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lymphoma</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hodgkin disease</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Generalized malignancy</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Iatrogenic immunosuppression*</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Solid organ transplant</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Multiple myeloma</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

*All adults 65 years of age or older should receive a dose of PPSV23, regardless of previous history of vaccination with pneumococcal vaccine.

*Including congestive heart failure and cardiomyopathies.
Case #1: Zika Virus
Zika Virus

- Women and their partners who are thinking about pregnancy should talk with their doctor or healthcare provider about
  - Their plans for having children
  - The potential risk of getting Zika during pregnancy
  - Their partner’s potential exposures to Zika
Zika Virus

- Suggested time frame to wait before trying to get pregnant following possible exposure via recent travel
  - **Women:** Wait at least 8 weeks after symptoms start or last possible exposure
  - **Men:** Wait at least 6 months after symptoms start or last possible exposure

Case # 2

- A 47 year old businessman is traveling to Mumbai, India
Case # 2

- A 47 year old businessman is traveling to Mumbai, India
  - No significant medical history
  - No previous travel outside the U.S.
  - 14 day trip
  - Staying in a hotel
  - Meetings with possible business collaborators
Case # 2: What medications would you recommend or prescribe?
Case # 2: What medications would you recommend or prescribe?

- Non-prescription
  - Anti-diarrheal
  - Medical kit for travelers

- **Malaria chemoprophylaxis**
  - India is holoendemic except for high altitude areas

- Empiric self-treatment for travelers’ diarrhea

- Other
  - Alcohol hand sanitizer
  - DEET-containing insect repellant
Malaria Chemoprophylaxis

- Risk of acquiring malaria differs substantially from region to region and from traveler to traveler, even within a single country
- Region with highest estimated relative risk for infection in travelers is West Africa
- Individual risk assessment needs to be undertaken for every traveler
  - No specific intervention
  - Mosquito avoidance measures only
  - Mosquito avoidance measures + chemoprophylaxis
Mosquito Avoidance

- Malaria transmission occurs primarily between dusk and dawn because of nocturnal feeding habits of *Anopheles* mosquitoes
- *Aedes* mosquitoes that transmit dengue and Zika feed during the day
- Screening
- Insecticide-treated bednets
- Pyrethroid-containing flying-insect spray in living areas
- Clothes that cover most of the body
- DEET-containing insect repellant
- Permethrin
# Malaria Chemoprophylaxis

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dosing</th>
<th>Contra-indications</th>
<th>Side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malarone</td>
<td>Daily</td>
<td></td>
<td>Rare</td>
</tr>
<tr>
<td>Mefloquine</td>
<td>Weekly</td>
<td>Psychiatric disease</td>
<td>Psychosis, seizures, GI upset BLACK BOX</td>
</tr>
<tr>
<td>Chloroquine</td>
<td>Weekly</td>
<td>+/- Psoriasis</td>
<td>GI upset, headache, dizziness</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>Daily</td>
<td></td>
<td>Yeast infection, Pill esophagitis, Photosensitivity</td>
</tr>
<tr>
<td>Primaquine</td>
<td>Daily</td>
<td>G6PD deficiency</td>
<td>GI upset</td>
</tr>
</tbody>
</table>

Terminal prophylaxis is generally indicated only for persons who have had prolonged exposure in malaria-endemic areas.
MEFLOQUINE HYDROCHLORIDE
Tablets USP

Rx only

WARNING

Mefloquine may cause neuropsychiatric adverse reactions that can persist after mefloquine has been discontinued. Mefloquine should not be prescribed for prophylaxis in patients with major psychiatric disorders. During prophylactic use, if psychiatric or neurologic symptoms occur, the drug should be discontinued and an alternative medication should be substituted (see WARNINGS).

DESCRIPTION

Mefloquine hydrochloride USP is an antimalarial agent available as 250 mg tablets of mefloquine hydrochloride USP (equivalent to 228 mg of the free base) for oral administration.

Mefloquine hydrochloride USP is a 4-quinolinemethanol derivative with the specific chemical name of (R*,S*)-(±)-α-2-piperidinyl-2,8-bis(trifluoromethyl)-4-quinolinemethanol hydrochloride. It is a 2-aryl substituted chemical structural analog of quinine. The drug is a white to almost white crystalline compound, slightly soluble in water.

Mefloquine hydrochloride USP has a calculated molecular weight of 414.78 and the following structural formula:
Dengue
Dengue
Case # 2: What immunizations would you recommend?

- Travel-related
- Routine
Travel-related Immunizations

- Hepatitis A
- Yellow Fever
- Polio
- Meningococcal
- Typhoid
- Rabies
- Japanese Encephalitis
Travel-Related Immunizations

- Hepatitis A
- Yellow Fever
- Polio**
- Meningococcal
- **Typhoid**
- Rabies
- Japanese Encephalitis
Typhoid

- 400 cases/year reported in U.S., mostly in recent travelers
- Higher risk groups:
  - >3 weeks of travel
  - Off usual tourist route
  - Staying with families or friends
  - South Asia (risk is 6-30 x higher than other destinations; drug resistance rates are high)
  - Immunocompromised, elderly, atherosclerosis, cholelithiasis
- Vaccines 50-80% effective
Routine Immunizations

- Influenza
- Pneumococcal
- MMR
- Tdap/Td
- Hepatitis B
- Varicella and shingles
- HPV
- Meningococcal
Routine Immunizations

- Influenza
- Pneumococcal
- **MMR**
- Tdap/Td
- **Hepatitis B**
- Varicella and shingles
- HPV
- Meningococcal
Measles

- Acceptable evidence of immunity to measles for international travelers:
  - Two doses of measles-containing vaccine, at least 28 days apart, on or after first birthday
  - Laboratory evidence of immunity
  - Birth prior to 1957
  - Physician-diagnosed measles

- ACIP recommended two doses of measles containing vaccine in 1989
Case # 3

• A 35 year old woman is traveling to Ghana
Case # 3

- A 35 year old woman is traveling to Ghana
  - No medical problems
  - 3 month visit
  - 1 week stay in a hotel in Accra
  - Remainder of visit staying with parents in rural area in north of country
  - Departing in January
Case # 3: What counseling would you provide?
VFR

• First- and second-generation immigrants who return to their country of origin to visit friends and relatives (VFR)
• Higher incidence of travel-related infectious diseases, such as malaria, typhoid fever, tuberculosis, hepatitis A and STDs, than other groups of international travelers
  – Lack of awareness of risk
  – <30% pursue pre-travel health care
  – Financial and cultural barriers
  – More likely to stay in homes
  – Belief that they are immune
VFR

• Same immunization recommendations as for U.S.-born travelers
• Crucial to establish whether the immigrant has had routine immunizations or has a history of disease
  – In the absence of documentation, traveler should be considered non-immune
• Consider varicella immunization for immigrants from tropical countries
• Encourage VFRs to purchase their medications before traveling to ensure good drug quality
Case # 3: What medications would you recommend or prescribe?
Case # 3: What medications would you recommend or prescribe?

- Non-prescription
  - Anti-diarrheal
  - Medical kit for travelers
- Malaria chemoprophylaxis
- Malaria self-treatment
- Empiric self-treatment for travelers’ diarrhea
- Other
  - Alcohol hand sanitizer
  - DEET-containing insect repellant
Malaria Self-Treatment

• Rate of false-positive of blood smears for malaria may be very high, particularly in Sub-Saharan Africa – travelers may be diagnosed with malaria incorrectly

• Halofantrine is widely available overseas but not recommended in US due to cardiac adverse events

• Self-treatment with atovaquone/proguanil (for travelers not taking it for chemoprophylaxis) or coartem can be provided
Case # 3: What immunizations would you recommend?

- Travel-related
- Routine
Travel-Related Immunizations

- Hepatitis A
- Yellow Fever
- Polio
- Meningococcal
- Typhoid
- Rabies
- Japanese Encephalitis
Travel-Related Immunizations

- Hepatitis A
- **Yellow Fever**
- Polio
- **Meningococcal**
- Typhoid
- **Rabies**
- Japanese Encephalitis
Adverse Events following Yellow Fever Immunization

• Yellow Fever Vaccine-Associated Neurologic Disease
  – Meningoencephalitis, GBS, ADEM, bulbar palsy
  – 3-28 days after vaccination
  – 0.8/100,000 doses administered
  – Higher rates in those $\geq$ 60 years

• Yellow Fever Vaccine-Associated Viscerotropic Diseases
  – Severe illness similar to wild-type disease; death
  – $>40$ confirmed or suspected cases since 2001
  – Higher risk with history of thymus disease, immunosuppression, age $\geq$ 60 years
Meningitis
Rabies

• Found on all continents except Antarctica
• Dogs are the main reservoir in developing countries
• Risk of rabies exposure in travelers: 16-200/100,000
Rabies Counseling

• Animal bite prevention strategies
  – Street dogs, monkeys
• Children are at higher risk
• Avoid caves
• Management of bite and strategy for obtaining post-exposure prophylaxis
  – Avoid animal brain-derived vaccines
Rabies Vaccine

• Pre-exposure rabies immunization is recommended for certain travelers
  – Animal handlers
  – Availability of appropriate anti-rabies biologicals
  – Duration of trip (4 weeks)

• Series of 3 doses of HDCV or PCEC vaccine given on days 0, 7, 21/28
Routine Immunizations

- Influenza
- Pneumococcal
- MMR
- Tdap/Td
- Hepatitis B
- Varicella and shingles
- HPV
- Meningococcal
Routine Immunizations

• Influenza
• Pneumococcal
• MMR
• Tdap/Td
• Hepatitis B
• Varicella and shingles
• HPV
Case # 4

A 24 year old man is traveling to Peru (Machu Picchu, Inca Trail, Amazon). What is the most likely cause of death in this traveler?

A. Infectious disease
B. Armed robbery
C. Motor vehicle accident
D. Altitude illness
Injuries

• Injuries are the leading cause of preventable death in travelers
  – Road traffic crashes (34%)
  – Homicide (17%)
  – Drowning (13%)

• Counsel travelers about safety belts, helmets, vehicle size/type
• Consider hiring local driver
Case # 4 con’t

He is flying directly to Cuzco from the United States. What symptoms might he develop after arrival?

A. Headache
B. Insomnia
C. Nausea
D. All of the above
Altitude Illness

• Acute mountain sickness is most common
  – Symptoms similar to alcohol hangover
  – Headache, fatigue, loss of appetite, nausea

• High altitude cities with airports include Cuzco (11,000 ft); La Paz (12,000 ft); Lhasa, Tibet (12,500 ft)

• Try not to fly directly to altitudes >9,000 ft

• Acclimatization to high altitude takes 3-5 days

• Acetazolamide
  – Most effective when taken prior to ascent
Case # 5

A 65 year old man with coronary artery disease, a history of MI, and insulin-dependent diabetes is traveling to Bangladesh. How should he prepare for an unanticipated medical problem while traveling?
Medical Evacuation

• Most health insurance companies do not cover medical evacuation or have the resources to organize an evacuation

• International SOS

• Medex
  – http://www.medexassist.com/

• Supply of medications & needles
Case # 6

A 46 year old woman returns from a 2 week safari in Tanzania. She has fever, myalgias and abdominal discomfort. What is the most important diagnosis to exclude?

A. Influenza
B. Dengue fever
C. Malaria
D. Acute schistosomiasis (Katayama fever)
E. Ebola
Fever in the Returning Traveler

• Focus in evaluating febrile returned traveler should be on identifying infections that are rapidly progressive, treatable or transmissible

• The possibility of malaria should be evaluated urgently by appropriate lab tests and qualified personnel; testing should be repeated if the initial result is negative

• Malaria symptoms can develop as early as 7 days or as late as several months after exposure to a malaria-endemic area
Who should I consider referring to a travel medicine specialist?

- Immunocompromised travelers
- Pregnant women
- Young children
- VFRs
- Individuals with complicated itineraries
- Long-term travelers
Key Resources

- CDC Travelers’ Health
  - Interactive malaria map
- CDC malaria hotline (770-488-7788)
- WHO International Travel and Health
  - [http://www.who.int/ith/en/](http://www.who.int/ith/en/)
- Travel Medicine guidelines of the Infectious Diseases Society of America (IDSA)
- International Society of Travel Medicine
- American Society of Tropical Medicine and Hygiene
Heading Home Healthy

• Heading Home Healthy is a program supported by the Massachusetts General Hospital, the New York City Department of Health and Mental Hygiene and the Centers for Disease Control and Prevention.

• Our goal is to help travelers stay healthy when they are returning home to visit friends and relatives.

• Website: www.headinghomehealthy.org
A Free Web-Tool for the Clinician

• Pre-Travel Providers’ Rapid Evaluation Portal (Pre-Travel PREP)
• Free, easy-to-use clinical web-tool that guides clinicians through preparing a US traveler for a safe and healthy trip based on recommendations from the U.S. Centers for Disease Control and Prevention
Resources For the Clinician

PREP Healthy Travel Checklist

**DURING YOUR TRIP**

1. Take Your Medications
   - Take all of the medicines you usually take when you are at home.
   - Take your anti-malarial medication (if prescribed). All anti-malarial medications start before your trip and continue after your return.
   - None
   - Doxycycline
   - Atovaquone-proguanil
   - Mefloquine
   - Chloroquine
   - Other:

2. Protect Yourself from Bug and Animal Bites
   - Avoid bug bites: use an insect repellent that contains at least 20% DEET.
   - Wear long-sleeved shirts, long pants, closed shoes, and hats, as much as possible.
   - Do not touch animals you don’t know, even if they look safe.
   - Seek immediate medical attention if you are bitten or scratched by any animal.

3. Be Careful What You Eat
   - Drink beverages that have been bottled and sealed and avoid ice.
   - Eat food that is fully cooked and served hot.
   - Wash your hands often or use a hand sanitizer frequently.
   - If you have diarrhea with fever or blood, take your anti-diarrheal antibiotic and seek medical care:
     - None
     - Azithromycin
     - Ciprofloxacin

4. Road and Motor Vehicle Safety
   - Always wear a seatbelt.
   - Wear a helmet when you ride a bike or motorcycle.
   - Look for oncoming traffic in both directions.
   - Avoid overcrowded buses and cars.
   - Avoid driving at night on unfamiliar roads.

**AFTER YOUR TRIP**

- Seek medical attention if you develop a fever during your trip or after your return.
- Follow-up with a health care provider if you were seriously ill or ill during your trip.

**PHYSICIAN NOTES:**

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NOTAS DEL MÉDICO:

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Version 1 (8/9/2014)
Promotional Materials: Posters

**HEADING HOME HEALTHY**

See a healthcare provider before your international trip, even if it’s last minute.

www.headinghomehealthy.org

**HEADING HOME HEALTHY**

Find out how to stay healthy on your international trip!

www.headinghomehealthy.org
Global TravEpiNet

• Global TravEpiNet is a U.S. CDC-sponsored national consortium focusing on collecting, analyzing, and communicating pre-travel data on health issues of U.S. international travelers
• Goal is to better inform the guidance that is provided to travelers by the travel medicine and public health communities
  – www.gten.travel
  – PREP (Pre-Travel Providers’ Rapid Evaluation Portal)
  – TRhIP (Travelers’ Rapid Health Information Portal)
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Global TravEpiNet Sites

Bronx Center for Travel and International Health
DeKalb County Board of Health Travel Services
Emory University
Georgetown University
HealthPartners Clinics
John Hopkins University
Kaiser Permanente Honolulu Clinic
Lehigh Valley Medical Center
Massachusetts General Hospital
New York Center for Travel and Tropical Medicine (Cornell University)

Mayo Clinic - Jacksonville
Northwestern University Memorial Hospital
St. Luke’s - Roosevelt University Medical Practice
Tulane University
University of California, San Diego
University of California, San Francisco
University of Southern California, Los Angeles
University of Utah