Travel Medicine
the Pre-Travel Consultation

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Scope of the Problem

- 40 million overseas visits annually
- >20 million visits to developing world
- 100,000 will spend >1 month there
- 50,000 will develop a health problem
- 8,000 will seek medical care
- 300 will be hospitalized
- 50 will be evacuated by air
- 1 of these will die
Travel-associated Illness Trends and Clusters, 2000–2010

Karin Leder, Joseph Torresi, John S. Brownstein, Mary E. Wilson, Jay S. Keystone, Elizabeth Barnett, Eli Schwartz, Patricia Schlangenhaus, Annelies Wilder-Smith, Francesco Castelli, Frank von Sonnenburg, David O. Freedman

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Table 1. Major diagnoses for returning travelers visiting 18 GeoSentinel sites, 2000–2010*

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>No. cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>1,762</td>
</tr>
<tr>
<td>Giardiasis</td>
<td>1,296</td>
</tr>
<tr>
<td>Dengue fever</td>
<td>888</td>
</tr>
<tr>
<td>Campylobacteriosis</td>
<td>596</td>
</tr>
<tr>
<td>Cutaneous larva migrans</td>
<td>577</td>
</tr>
<tr>
<td>Rabies postexposure prophylaxis</td>
<td>349</td>
</tr>
<tr>
<td>Enteric fever†</td>
<td>262</td>
</tr>
<tr>
<td>Spotted fever rickettsiosis</td>
<td>220</td>
</tr>
<tr>
<td>Chikungunya</td>
<td>120</td>
</tr>
<tr>
<td>Acute hepatitis A</td>
<td>94</td>
</tr>
<tr>
<td>Confirmed influenza A/B</td>
<td>84</td>
</tr>
</tbody>
</table>

*Other diagnoses included nonspecific gastrointestinal or diarrheal syndromes (≈25% of all patients); nonspecific febrile illness or viral syndrome (≈10%); rash, itch, or skin infection (≈10%); respiratory syndrome (≈5%); and other infectious and noninfectious problems.
†Salmonella enterica serovar Typhi, S. enterica ser. Paratyphi, or unspecified.
Nature of the Travel

- **Vacation**
  - to well-established tourist spots
  - “adventure travel”

- **Business Trips**

- **Visiting Homeland (“VFR Travelers”)**

- **Exchange Students/Youth Hostels**

- **Long-Term Travel**
  - Military, Diplomatic Corps, etc
TRAVEL MEDS

- Travel Kits
- Rabies & Animals
- Arthropods
- Vaccines
- Environmental
- Life Among Natives

- Malaria
- Emergencies
- Diarrhea
- Safety
Travel Kits

- First Aid Supplies
- Malaria Prophylaxis
- Diarrhea Therapy
- Rx for Chronic Diseases
- Rx for:
  - motion sickness
  - jet lag
  - altitude sickness
- Water Purification
- Insect Repellents/Nets
Rabies
Candidates for PRE-Exposure Prophylaxis

- Veterinarians
- Veterinary Students
- Laboratory Workers
- Spelunkers

Visitors to Certain Countries
- Brazil, Bolivia, Colombia, Ecuador, El Salvador, Guatemala, India, Mexico, Nepal, Peru, the Philippines, Sri Lanka, Thailand, and Vietnam.

Pre-Exposure Regimen:
Three doses:
Day 0, 7, 21/28
Post-Exposure Rabies Prophylaxis

- Two licensed & available vaccines
  - HDCV, PCEC
- Both require 4 doses IM in Deltoid
  - Day 0, 3, 7, 14
- Rabies Immune Globulin (RIG) 20 IU/kg
  - 50-100% locally, remainder IM
- Vigorous wound cleansing
- Two doses required in Pre-Immunized
  - Day 0, 3
Arthropods

Ticks
- RMSF, Typhus, TBE, Lyme, Babesiosis, Relapsing Fever

Sandflies
- Leishmaniasis, Sandfly Fever, Oroyo Fever

Mosquitoes
- Malaria, Filariasis, Dengue, JEB, Alphaviruses, many ARBOviruses

Flies
- Trypanosomiasis, Tularemia, Anthrax, Loiasis

Lice
- Typhus, Relapsing Fever, Trench Fever

Fleas
- Plague, Murine Typhus

Mites
- Scrub Typhus, Scabies
Arthropods

- **Avoidance**
  - work during daylight
  - avoid jungle

- **Physical Protection**
  - wardrobe
  - netting & screens

- **Chemical Protection**
  - DEET (skin)
  - Permethrins (clothing)
DoD Repellent System

permethrin on uniform

+ deet on skin

+ properly worn uniform

= Maximum Protection
Vaccines I:
All Persons

- DTaP or Tdap
- MMR
- IPV
- HiB
- Hepatitis A
- Hepatitis B
- Influenza
- Pneumococcus
- Meningococcus
- Varicella
- Rotavirus
- HPV
Vaccines II: Most Foreign Travelers

- Hepatitis A
- Typhoid
  - TY 21a
  - Vi CPS
Vaccines III: Select Travelers

- Meningococcus
- Japanese Encephalitis
- Yellow Fever
- Rabies
- BCG
- TBE?
Vaccines IV:
To Satisfy Requirements

- Yellow Fever
- (Cholera)
Vaccines V: Military-Specific

- Anthrax
- Smallpox
- Adenovirus
- (Plague)
## Vaccines for Pediatric Travelers

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Age</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis A</td>
<td>&gt;1 yrs</td>
<td>0.5 x adult</td>
</tr>
<tr>
<td>Meningo</td>
<td>&gt;9 mos</td>
<td>2 doses</td>
</tr>
<tr>
<td>JEV</td>
<td>&gt;2 mo</td>
<td>0.5 x adult</td>
</tr>
<tr>
<td>Cholera</td>
<td>&gt;6 mos</td>
<td>Varies</td>
</tr>
<tr>
<td>Yellow Fever</td>
<td>&gt;9 mos</td>
<td>Same as adult</td>
</tr>
<tr>
<td>Vaccine</td>
<td>Route</td>
<td>Age</td>
</tr>
<tr>
<td>----------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Ty21a</td>
<td>PO</td>
<td>&gt;6 y</td>
</tr>
<tr>
<td>Vi CPS</td>
<td>IM</td>
<td>&gt;2 y</td>
</tr>
<tr>
<td>HPI</td>
<td>SQ</td>
<td>&gt;6 m</td>
</tr>
</tbody>
</table>
Environmental Concerns

- Motion Sickness
- Sun Exposure
- Water Exposure
  - Fresh Water
  - Marine
- Dehydration
- Air Pollution
- Altitude Sickness
- Decompression Illness
Life Among the Natives

- Increased Casual Sex during Travel
- “Sex Holidays”
- 30% in Africa report:
  - casual sex with natives
  - sex without condoms
- HIV rates in Africa 50-500 fold greater
- Syphilis, Hepatitis B rates also high
Life Among the Natives: The Ugandan Model

- **Abstain**....
- **Be** Faithful, or....
- **Wear** a **Condom**
Malaria

Malaria-Endemic Countries
- Malaria Endemic
- Not Malaria Endemic

*Note: In this map, countries with areas endemic for malaria are shaded completely even if transmission occurs only in a small part of the country. For more specific within-country malaria transmission information, please see the Yellow Fever and Malaria Information, by Country section in Chapter 3 and the CDC Malaria Map Application (www.cdc.gov/malaria/map).
Malaria

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Mefloquine Resistance
Malaria Prophylaxis

◆ Chloroquine-Sensitive
  – Chloroquine
    ▶ 500 mg q week

◆ Applies to:
  – Caribbean
  – Latin America
    ▶ North of Canal
  – Middle East
  – North Africa

◆ Chloroquine-Resistant
  – Mefloquine
    ▶ 250 mg q week
  – Doxycycline
    ▶ 100 mg q day
  – Chloroquine + Proguanil
  – Atovaquone + Proguanil

◆ Applies to:
  – Sub-Saharan Africa
  – South & SE Asia
  – Tropical S America
Emergencies

- Health Insurance
  - Evacuation Coverage
- Know U.S. Physician
- Foreign Physicians
- Register w/ Embassy
- Communications
- Medication List
- Special Care Plans
Diarrhea: Prevention I

- **Water**
  - Bottled or Treated

- **Food**
  - “Wash it, boil it, peel it, or forget it”

- **Problems**
  - Ice
  - Leafy Vegetables
  - Fish & Shellfish (ceviche, sushi, oysters)
  - Meat (steak tartare)
Water Purification

- Bottled Water
- Heat (Boiling)
- Filtration
  - Reverse Osmosis
  - Activated Carbon
- Halogen Treatment
  - Iodine
  - Chlorine
Diarrhea: Prevention II
Non-Specific Prophylaxis- Bismuth Subsalicylate

- Studied only in Adults
- Studied in Mexico
- 4.2 g/day
  - 60 ml qid, or…
  - 4 tablets qid
  - equiv to 8 x 325 ASA
- 23% vs 61% diarrhea
- 2.1 g/day as effective?
Diarrhea: Prevention III

Specific Prophylaxis

- TMP-SMX
  - 4-5 mg/kg (TMP) qd
- TMP
  - 2 mg/kg qd
- Doxycycline
  - 100 mg qd
- Ciprofloxacin
  - 500 mg qd
Diarrhea: Empiric Therapy

- Ciprofloxacin
  - 500 bid x 3 days
- TMP-SMX
  - bid x 5 days
- Trimethoprim
  - bid x 5 days
- Imodium
  - not for children <6 yo
Safety

- Accidents
  - leading cause of morbidity & mortality
  - road conditions & driving habits
  - direction of traffic flow
  - public transportation

- Civil & Political Unrest

- Crime

- Terrorism
US CDC


Practice Evidenced Based Medicine

The Practice of Travel Medicine: Guidelines by the Infectious Diseases Society of America

David R. Hill,1,2 Charles D. Ericsson,5 Richard D. Pearson,9,10 Jay S. Keystone,3,4 David O. Freedman,13,14 Phyllis E. Kozarsky,15,16 Herbert L. DuPont,6,7,8 Frank J. Bia,17,18 Philip R. Fischer,19,20 and Edward T. Ryan21,22,23

IDSA Guidelines • CID 2006:43 (15 December) • 1499

Travel Medicine Resources

- U.S. Department of State
  - www.travel.state.gov
- MILVAX
  - www.vaccines.mil/QuickReference
- CIA Factbook
  - www.cia.gov/cia/publications/factbook
- National Center for Medical Intelligence
  - www.intelink.gov/my.policy
- Travax: AMEDD Virtual Library
  - https://medlinet.amedd.army.mil
- International Society of Travel Medicine website
  - http://www.istm.org/
Hiram S. Dudson
1930 - 1993
Member, Placebo Group