

Travel Medicine

Preparing Your Patient for Worldwide Travel

Fred Miser, MD, MA, FAAFP
Residency Director
Professor of Family Medicine
Department of Family Medicine
The Ohio State University Wexner Medical Center



The Case of Mr. B

- 68 y/o recently retired accountant
- Hypertension – here for BP check
- Soon to celebrate 50th wedding anniversary – wants to “travel the world” - 2nd honeymoon dream of a lifetime
- Asks advice about the trip
- What do you do?

93 million US citizens travel abroad each year



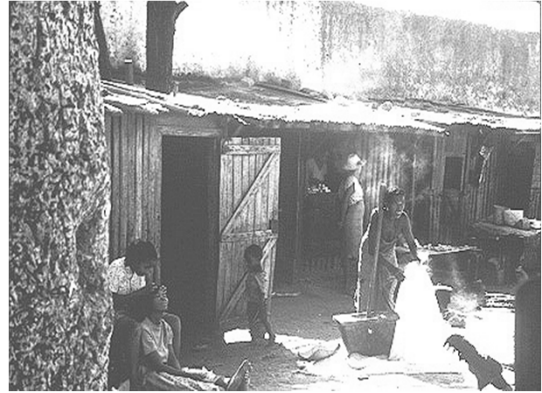
For fun and relaxation....



For romance....



For adventure or business....



For humanitarian service....



***Ferdinand Magellan*
The First Worldwide Traveler
1521**



Cebu, Philippines

Ferdinand Magellan
An Example of Disaster
April 27, 1521



Magnitude of International Travel

- 50% will become ill while abroad
- Only 28% of travelers obtain medical pre-travel advice - most think it is unnecessary
- Minor diseases can ruin vacations
- Other diseases (rare) can be deadly
- Prevention and Preparedness



Purposes of Presentation

- Provide pre-travel care
 - Focus on prevention
 - Traveler's diarrhea
 - Malaria prophylaxis
 - Immunizations
- Post-travel care
- Frequently asked questions



What's Needed For Travel Medicine

- Current info on travel advice and immunizations
 - computerized travelers' health databases
 - e.g. TRAVAX 
 - CDC on the Internet (www.cdc.gov/travel)

CDC Travel Information

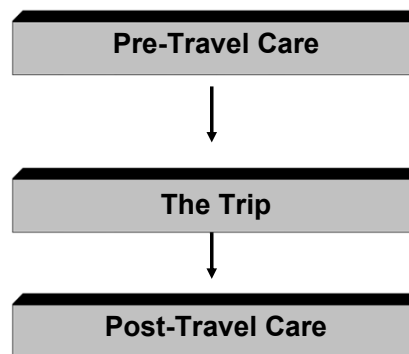




What's Needed For Travel Medicine

- Adequate supply of immunizations
- Pharmacy that carries meds
- Reliable lab
- ID consultants

Components of Travel Medicine



Pre-Travel Care

- Ideally begun 8-12 weeks *before* travel
 - assess travel risks
 - complete required immunizations
 - obtain necessary meds and medical supplies

Initial Visit

The Who



- Age (children, elderly)
- Gender (pregnancy)
- General health
 - Current med list
 - Allergies
 - Immune status



Initial Visit
The What

- Reason for trip
- Length of stay
- Potential food sources
- Anticipated social activities
- Potential animal exposures



Initial Visit
The When

- Departure date
- Season
- Day and night exposure activities



Initial Visit
The Where

- Countries (? developing)
- Sequence of itinerary
- Rural vs. urban
- ? off the “beaten” path
- Accommodations
- Access to quality medical care
- Climate and altitude



Initial Visit
The How

- Air travel
 - Jet lag, DVT, COPD
- Sea travel
 - motion sickness
- Overland travel
 - accidents



General Advice

- Accidents
- Health care and evacuation insurance
- Personal supplies
- Sun protection
- Food & water hygiene
- Proper clothing
- Insect repellents
- Freshwater swims
- Air travel
- STIs

Causes of Death in Travelers

- 65% occurred in those over age 55
- 70% occurred in men
- 59% died outside of hospitals
- Causes of death
 - 49% - cardiovascular
 - 22% - unintentional injuries
 - 1% - infections (malaria, typhoid, hep B)

Hargarten SW, et al: Overseas fatalities of United States citizen travelers: an analysis of deaths related to international travel. *Ann Emerg Med* 20(6):622-6, 1991.

Causes of Death in Travelers

**8,582 traumatic deaths of US citizens abroad
2009-18**

- Vehicular accident (2158)
- Homicide (1758)
- Suicide (1502)
- Drowning (1260)
- Other accident (1090)
- Air accident (208)
- Pedestrian (189)
- Drug related (187)
- Disaster (151)
- Terrorism (134)
- Maritime accident (87)

Information obtained from <https://www.travel.state.gov>

The Accidental Tourist

“Remember Princess Diana”

The Accidental Tourist



The Accidental Tourist



The Accidental Tourist

- Inadequate emergency services
 - trauma centers nonexistent
 - chances of dying in a MVA while traveling abroad are 7-18 times greater than in the US
 - 80% of US citizens dying abroad from injuries do so outside of a hospital



The Accidental Tourist

- Wear seat belts (if available)
- Don't drink alcohol and drive or participate in water activities
- Become familiar with local motor vehicle laws
- Drive during daylight hours
- Avoid motorbikes and motorcycles

Health Care Insurance

- Limitations in coverage by standard health care policies while abroad
 - no coverage at time of service
- Medicare does NOT cover medical expenses outside the US
 - Medicare Supplement Plan (C-J)
- Shop around for travel health care insurance

Medical Evacuation Insurance

- Emergency evacuation may be desirable (and necessary)
- Evacuation costly - up to \$100,000 for an air ambulance
- Most health plans don't cover emergency evacuation



Food & Water Hygiene

- *"Part of the secret of success is to eat what you like and let the food fight it out inside."* - Mark Twain
- 30-70% develop traveler's diarrhea
- 98% of informed travelers make at least one dietary "mistake" while abroad

GEOGRAPHIC DISTRIBUTION OF HEPATITIS A VIRUS INFECTION





Food Hygiene



- *“Cook it, peel it, boil it, or forget it”*
- Wash hands thoroughly
 - Alcohol-based hand sanitizer if no soap
- Risky foods
 - fresh vegetables, raw meat or seafood, unpeeled fruit, “tap” water, ice cubes, milk and dairy products, watermelon
- Ciguatera fish poisoning

Traveler’s Diarrhea Beware of Meat Vendors



Traveler’s Diarrhea Beware of Condiments



“Don’t Drink the Water”



Beware of the Ice



Traveler's Diarrhea



Traveler's Diarrhea

- Most common health problem
- Infectious
 - Bacteria (85%), parasites (10%), viruses (5%)
 - *E. coli* most common cause worldwide
- Chemoprophylaxis not recommended
- Early treatment
 - oral rehydration therapy
 - antimotility agents - loperamide
 - antibiotics for 1-3 days

Traveler's Diarrhea

- Recommended antibiotics (1-3 days)
 - Ciprofloxacin 500 mg bid
 - Levofloxacin 500 mg once
 - Azithromycin 500 mg twice in a day
 - Rifaximin 200 mg tid
 - Rifamycin (Aemcolo®)
- Seek care if dysentery occurs



Cruise Ships and Norwalk Virus

“Caribbean Cruise Ship Turns into Diarrhea Nightmare Vessel”

- Frequent cause of large outbreaks of acute gastroenteritis
- Prevention - wash hands frequently!
- “Green Pages” on CDC web site
 - “score cards” for hygiene aboard cruise lines



Image courtesy of the CDC/Photo credit: James Gathany



Avoid Insect Bites

- Avoid colognes and perfumes
- Wear proper clothing – minimize skin
 - Wear shoes
 - Long sleeves and pants
- Avoid outdoors during twilight
- Use insect repellants

Mosquito Nets

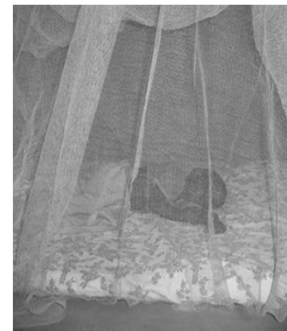



Image courtesy of the CDC



Malaria

- **Prevention = #1**
- **Antimalarial chemoprophylaxis**
 - chloroquine
 - atovaquone-proguanil (Malarone®)
 - doxycycline
 - mefloquine (Lariam®)
 - primaquine
 - tafenoquine (Arakoda™)

Zika Virus

- Spread by *Aedes* mosquito and by sex with infected partner
 - Many infections are asymptomatic
 - Infection in pregnancy may lead to birth defects (microcephaly)
 - No vaccine or specific treatment
 - Dx by lab confirmation
- 
- Traveling to Zika endemic area – risk?
 - Men exposed to Zika should abstain or use condoms for 3 months of trying to conceive

Dengue Fever & Chikungunya

- Increasing in many countries
- Transmitted by *Aedes* mosquito
 - Daytime feeder
- No vaccines currently available in US
 - Dengue vaccine



Immunizations



- “What shots do I need”
- Must balance risks vs benefits
- Properly document
- Most can be given simultaneously
- Avoid (if possible) live virus vaccines in pregnant or immunocompromised patients

3 Categories of Immunizations

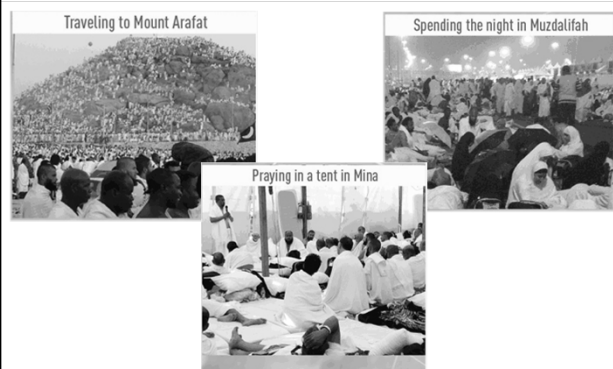


- Routine
 - Recommended for everyone
 - Td or DTaP
 - IPV – one booster
 - MMR
 - 6-11 mos
- Required by law
 - Yellow fever

3 Categories of Immunizations

- Recommended based on destination
 - Typhoid
 - Hepatitis A
 - Others
 - Hepatitis B, Prevnar, Influenza
 - Meningococcal, Japanese B Encephalitis, Rabies, Plague
 - Cholera (Vaxchora®) – (Dukoral®)

To Immunize or Not?



Meningococcal Disease & Pilgrimage to Mecca

To Immunize or Not?



To Immunize or Not?



Remember the PPD

- “The risk of *M. tuberculosis* in long-term travelers to high-endemicity countries, even if not engaged in health-care work, is substantial and of similar magnitude to the average risk for the local population.”

Cobelens FGJ, et al: Risk of infection with *Mycobacterium Tuberculosis* in travelers to areas of high tuberculosis endemicity.
Lancet 2000; 356:461-65.

Avian Influenza A (H5N1, H7N9)



- Animal outbreaks in Asia, Middle East, Europe, and Africa
- Spread
 - Fowl -> Fowl
 - Fowl -> Humans (close, direct contact)
 - Humans -> Humans (extremely rare)
- Prevention
 - Avoid contact with poultry and birds
 - Avoid undercooked poultry and eggs



Ebola Virus Disease



- **Sub-Saharan Africa**
 - Latest outbreak Democratic Republic of the Congo
- **Direct contact with an infected animal (bat or nonhuman primate) or bodily fluids from an EVD infected or dead person**
- **No approved vaccine or treatment**
- **Avoid contact with blood or body fluids**
- **Avoid contact with wild animals and bushmeat**
- **Ask about potential exposure**

Special Categories of Travelers

- **Children**
- **Pregnant women**
- **Diabetes mellitus**
- **Lung disease**
- **Cardiac disease**
- **HIV disease**



CDC Travel Information

<http://www.cdc.gov/travel>



TravelWell

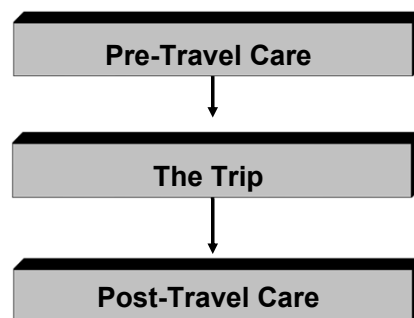


Can I Eat This?



Yellow Book

Components of Travel Medicine





Post-Travel Care

- Assess any illness during travel
- Update the problem list
- Determine need for further meds or lab
 - Stool studies, CBC, LFTs, UA



Post-Travel Care

- Symptoms may begin days, weeks, or months after travel
- Don't miss malaria!!!
- Concerning symptoms
 - fever
 - diarrhea
 - rash
 - passage of a "worm"

Fever in the Returned Traveler

- ? tropical infection vs. common illness
- Malaria is potentially fatal and may progress rapidly
 - r/o ASAP in all febrile patients who have traveled recently in the tropics
 - don't miss malaria - may occur up to 1 year after travel

Fever in the Returned Traveler

- Useful diagnostic tests
 - thick & thin blood smear for malaria
 - CBC, LFTs, UA
 - cultures of blood, urine and stool
 - arbovirus serology

Frequently Asked Questions



Travel Medicine

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Jeanette Davis, RN, BSN
Patient Care Coordinator
OSU Thomas E. Rardin Family Practice
The Ohio State University Wexner Medical Center

FAQs - Immunizations

- Is there a shot for malaria?
- Is there a shot for Dengue Fever?
- Is there a shot for Bird Flu?
- What about the cholera vaccine?
- Can I get a gamma globulin shot?

FAQs - Immunizations

- Are there any restrictions?
 - Can I drink alcohol?
 - Can I work out or play sports?
- Oral Typhoid
 - Keep in refrigerator
 - Avoid alcohol within two hours
 - Avoid eating 1 hour before, 2 hours after taking the vaccine
 - Avoid antibiotics for 3-7 days

FAQs - Immunizations

- Live vaccines
 - e.g. Yellow Fever, MMR, Varicella, Zostavax
 - Must be given together, or separated by a month
 - Exception – oral Typhoid, oral Cholera
- 10-14 days to be effective

FAQs - Insect Repellents (Mosquitos, Ticks, Fleas, Arthropods)

- DEET
 - Most effective repellent available
 - Keep concentrations at 30-35% for adults and $\leq 30\%$ for children
- Picaridin
 - Effective alternative to DEET
 - Does not irritate the skin
- Sunscreen first, then repellent
- Permethrin and Pyrethroid
 - Clothing, bed nets, sleeping bags

FAQs - Insect Repellents (Mosquitos, Ticks, Fleas, Arthropods)

- Malaria, Yellow Fever, Zika, Dengue Fever and Chikungunya
 - No vaccines currently available in US
- African mosquitoes
 - Large
 - Persistent
 - Disease virulent



FAQs – Malaria

- Resistance to medications
- Chloroquine
 - Preferred if in sensitive area
 - Weekly
 - Few side effects
 - Inexpensive
 - Avoid overdose

FAQs – Malaria

- Doxycycline
 - Daily
 - Take 2 days before, during, and 4 weeks after the trip
 - Side effects – sun sensitivity, vaginal yeast infection, GI
 - Inexpensive - \$50

FAQs – Malaria

- Malarone
 - Daily
 - Take 2 days before, during, and 1 week after the trip
 - Well tolerated
 - Avoid in Stage 4 CKD
 - Cost - \$75-\$100 for 10 day trip

FAQs – Malaria

- Mefloquine (Lariam®)
 - Mental health issues
- Primaquine
 - G6PD testing
- Tafenoquine (Arakoda™)
 - G6PD testing, complicated instructions, still relatively new
- Obtain medication in US

FAQs – Traveler's Diarrhea

- Antibiotic choices
 - Ciprofloxacin vs. Azithromycin
- Food choices
 - Everything well cooked
 - No street vendors
 - Easy-to-pack supplemental food
- Constipation
- Attach toothbrush to bottled water

Other Tips

- Hand sanitizers
- Mask
- Carry prescribed medications in original containers – not in checked luggage
- With prolonged air, train or auto travel, beware of DVT risk

Other Tips



- Know which city or country close by has reliable or expert health care
- Know how to reach the US embassy
 - Consider registering
- Be aware of social customs
- Be aware of uprisings, crime
- Sign up for the Travel.gov Smart Traveler Enrollment Program (STEP)

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Summary

- 1 -

- Travel medicine is more than just “shots”
- Prevention and Preparedness are important aspects of travel medicine
- Components of travel medicine
 - pre-travel care
 - post-travel care



Summary

- 2-

- **Initial visit - who, what, when, where, how**
- **Cardiac and accidents are major causes of death in travelers**
- **General advice to travelers is important**

personal supplies	proper clothing
sun protection	insect repellents
food & water hygiene	STD's
air travel	immunizations



Summary

- 3-

- **Post-travel care**
 - **don't miss malaria!**
- **It's essential to remain current if you are going to provide care to your traveling patients**