

# **Travel Medicine**

***Preparing Your Patient for Worldwide Travel***

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## **The Case of Mr. B**

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

**93 million US citizens travel abroad each year**



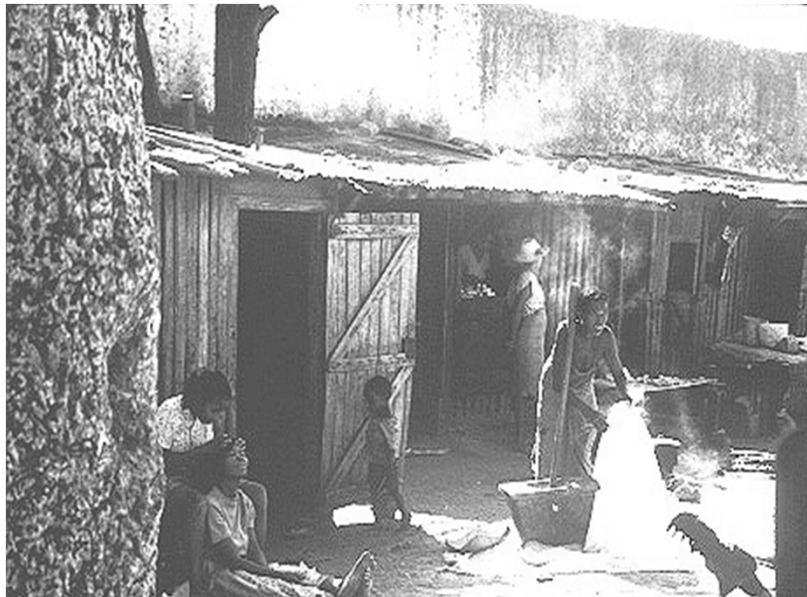
**For fun and relaxation....**



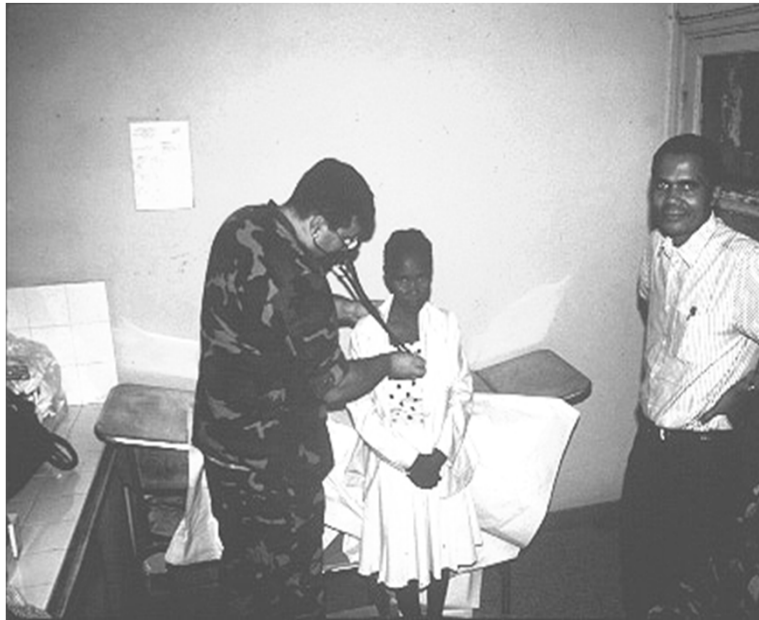
**For romance....**



**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](http://www.cdc.gov/travel))

**CDC Travel Information**

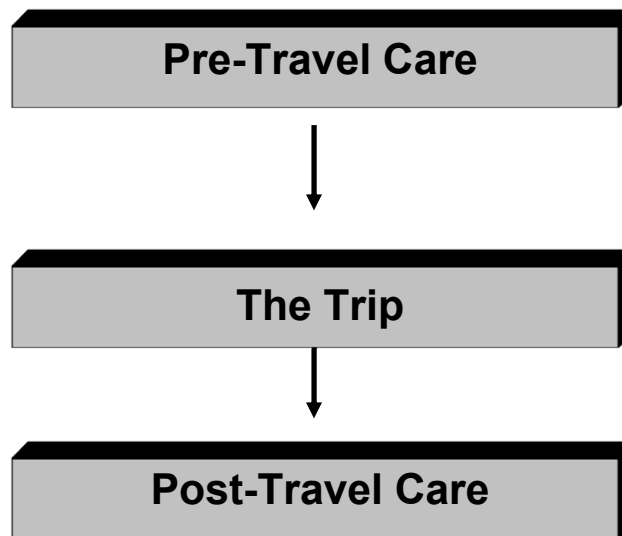




## **What's Needed For Travel Medicine**

- 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***

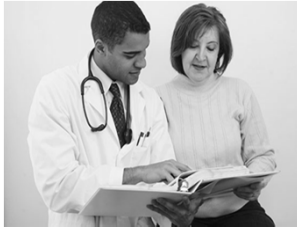
- **Countries (? developing)**
- **Sequence of itinerary**
- **Rural vs. urban**
- **? off the “beaten” path**
- **Accommodations**
- **Access to quality medical care**
- **Climate and altitude**



## 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**

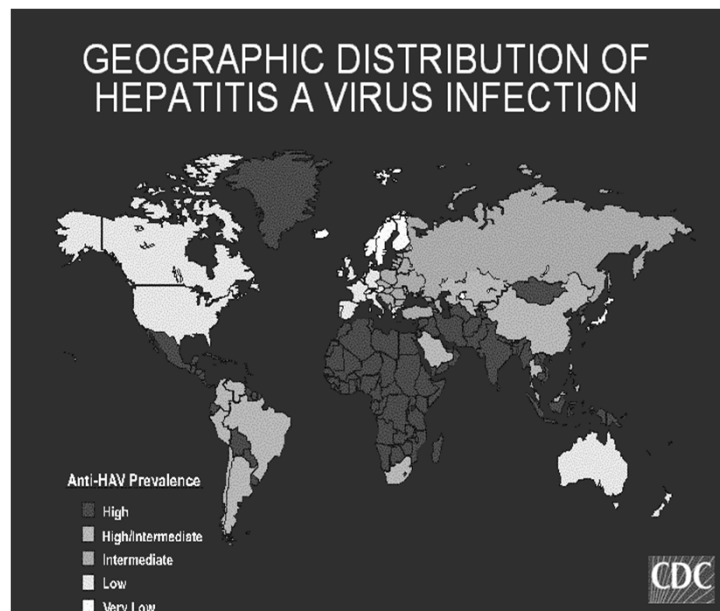
## **Medical Evacuation Insurance**

- **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**





# 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**

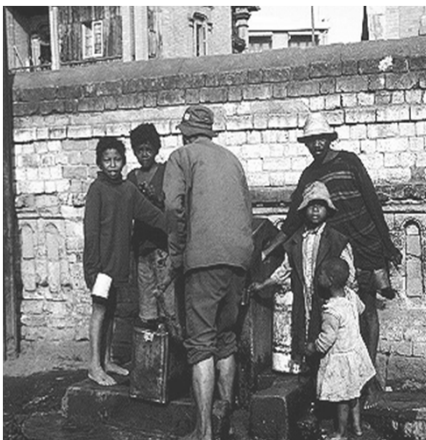


## ***Traveler's Diarrhea***

### **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



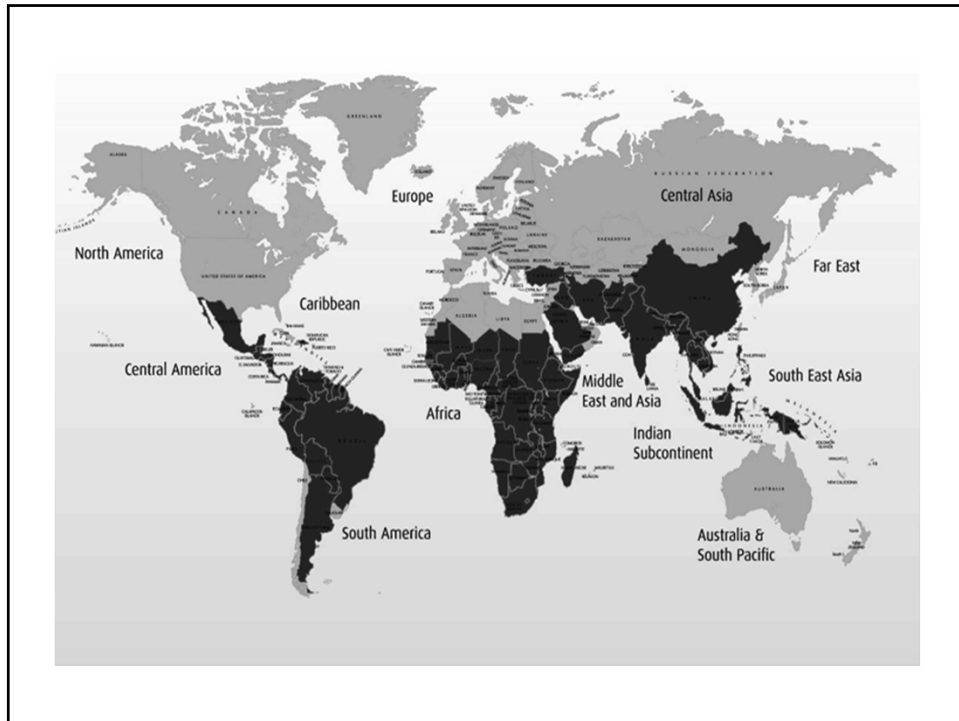
## Avoid Insect Bites

- **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<sup>®</sup>)
  - doxycycline
  - mefloquine (Lariam<sup>®</sup>)
  - primaquine
  - tafenoquine (Arakoda<sup>™</sup>)

# 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

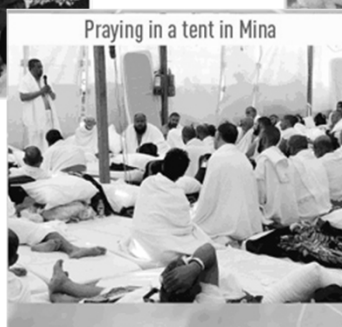
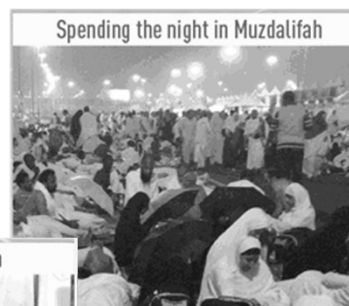
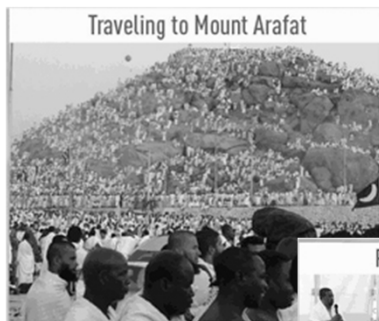


- Routine
  - Recommended for everyone
  - Td or DTaP
  - IPV – one booster
  - MMR
    - 6-11 mos
- Required by law
  - Yellow fever

### 3 Categories of Immunizations

- Recommended based on destination
  - Typhoid
  - Hepatitis A
  - Others
    - Hepatitis B, Pevnar, 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**

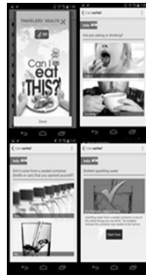


# CDC Travel Information

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



TravWell

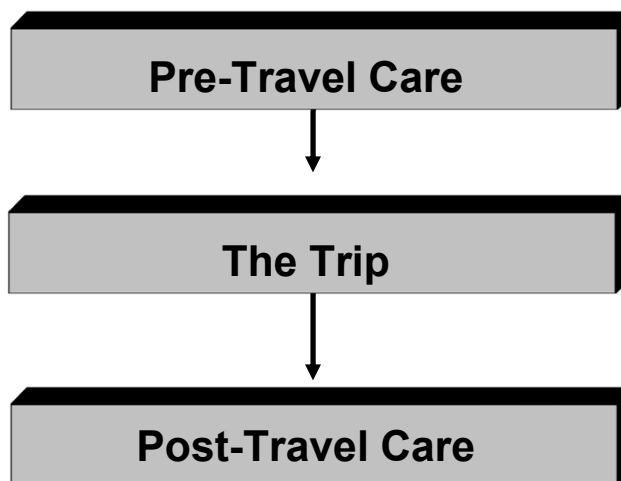


Can I Eat This?



Yellow Book

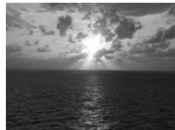
## Components of Travel Medicine





## 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

*Preparing Your Patient for Worldwide Travel*

**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 ≤ 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
  - sun protection
  - food & water hygiene
  - air travel
  - proper clothing
  - insect repellents
  - STD's
  - 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**