Preparing the Traveler

WRAIR-GEIS Operational Infectious Disease Course
Objectives

- Discuss the epidemiology of travel-related illness
- Review key elements of the pre-travel encounter
- Identify useful online travel medicine resources
What Are the Risks?
US Resident Travel Abroad: 2002-2011

Source: "2011 United States Resident Travel Abroad", US Department of Commerce, International Trade Administration, Office of Travel & Tourism
Malaria Cases in US Citizens

GeoSentinel Surveillance Sites

Source: Surveillance for Travel-Related Disease – GeoSentinel Surveillance System, United States, 1997-2011; MMWR, 19 Jul 2013
Figure 2. Proportionate Morbidity among Ill Travelers Returning from the Developing World, According to Region of Travel. The proportions are shown, not incidence rates, of each of the top 22 specific diagnoses for all ill returned travelers within each of the regions. STD denotes sexually transmitted disease. Asterisks indicate syndromic diagnoses for which specific etiologic diagnoses could not be assigned.
QUESTION:

What is the most likely cause of death in US citizens traveling internationally?
Causes of Death Among International Travelers

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Year of travel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of deaths</td>
<td>185</td>
<td>2463</td>
<td>247</td>
<td>68</td>
<td>17,988</td>
<td>421</td>
<td>952</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>8.0</td>
<td>49.0</td>
<td>14.0</td>
<td>15.0</td>
<td>45.0</td>
<td>35.0</td>
<td>68.9</td>
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<tr>
<td>Infection</td>
<td>5.0</td>
<td>1.0</td>
<td>–</td>
<td>3.0</td>
<td>–</td>
<td>2.4</td>
<td>3.6</td>
</tr>
<tr>
<td>Other illness</td>
<td>8.0</td>
<td>?</td>
<td>2.0</td>
<td>9.0</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Accidents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road accident</td>
<td>36.0</td>
<td>7.0</td>
<td>13.0</td>
<td>12.0</td>
<td>37.0</td>
<td>28.3</td>
<td>–</td>
</tr>
<tr>
<td>Air crash</td>
<td>5.0</td>
<td>2.0</td>
<td>4.0</td>
<td>12.0</td>
<td>7.0</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Drowning</td>
<td>14.0</td>
<td>4.0</td>
<td>4.0</td>
<td>9.0</td>
<td>15.0</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Other injuries</td>
<td>23.0</td>
<td>12.0</td>
<td>2.0</td>
<td>11.0</td>
<td>23.0</td>
<td>26.0</td>
<td>20.7</td>
</tr>
<tr>
<td>Unknown</td>
<td>–</td>
<td>25.0</td>
<td>58.0</td>
<td>29.0</td>
<td>–</td>
<td>17.0</td>
<td>7.0</td>
</tr>
</tbody>
</table>

PCV, Peace Corps Volunteers (US).

Source: Keystone et al. Travel Medicine. 2004
Objectives

• Discuss the epidemiology of travel-related illness
• Review key elements of the pre-travel encounter
• Identify useful online travel medicine resources
Goals of The Pre-Travel Encounter

• Protect travelers from disease and death associated with international travel

• Minimize the impact of travel-related illness through the use of self-treatment

• Protect the public from emerging pathogens associated with international travel
Key Things to Remember

• Risk may be difficult to estimate, but risk assessment is essential nonetheless
• Goal should be to “manage” risk, not “eliminate” risk
• Vaccines and chemoprophylaxis are wonderful, but only go so far – consider other PPMs
• Illness can occur during and following travel
• What we do for the leisure traveler may be different from what we do for the deploying individual or unit
When is a Travel Health Consultation Needed?

Travel Outside the “Safe” Zones

- United States & Canada
- Western & Northern Europe
- Japan, Australia & New Zealand
The Pre-Travel Encounter

• Review of Itinerary and Medical History
• Immunizations
• Malaria Prophylaxis
• Self-Treatment Medications
• Personal Preventive Measures
The Pre-Travel Encounter

• Review of Itinerary and Medical History
• Immunizations
• Malaria Prophylaxis
• Self-Treatment Medications
• Personal Preventive Measures
Review of Itinerary

• Where?
  – Country, region, urban/rural, altitude
• When?
  – Length of travel, time of year
• Why?
  – Leisure, work, humanitarian
• Who?
  – Travel companions, visiting friends/relatives (VFR)
• What?
  – Basic tourism/sightseeing itinerary vs. adventure travel
• How?
  – Lodging, meals/water, transportation, medical care
Review of Current/Past Medical History

• Current Medical Conditions
  – Heart disease, pulmonary disease, renal disease, MS, thymus disorder, HTN, DM, immune system disorders, malignancy
  – Pregnancy/breastfeeding

• Past Medical History
  – Psychiatric, cardiac conditions, epilepsy/seizures, DVT, ear/sinus problems

• Medications

• Allergies
  – Medications, vaccines, foods, latex

• Vaccination History
The Art of Travel Medicine: Pre-Travel

Risk of the location
Risk of the itinerary/activities/behavior
Risk of the individual traveler

Risk Tolerance of the Traveler
Risk Tolerance of the Provider

Recommended Preventive Measures
- Vaccines
- Chemoprophylaxis
- Self Treatment
- Personal Preventive Measures
The Pre-Travel Encounter

• Review of Itinerary and Medical History
• Immunizations
• Malaria Prophylaxis
• Self-Treatment Medications
• Personal Preventive Measures
Immunizations for Travelers

• “Travel” Vaccines
  - Widespread Risk
    • Hepatitis A
    • Typhoid
  - Geographic Risk
    • Yellow Fever
    • Meningococcal
    • Polio
    • Japanese Encephalitis
  - Duration/Activity Risk
    • Hepatitis B
    • Rabies

• “Routine” Vaccines
  - Childhood
    • MMR, Varicella, DTaP, Polio, HiB, Hep A, Hep B, PCV, Rotavirus, Influenza
  - Adolescent/Adult
    • Tdap
    • Meningococcal
    • HPV
    • Influenza
    • Pneumococcal
    • Varicella/Zoster
    • MMR
Hepatitis A Immunization

Geographic Distribution of Hepatitis A

CDC Health Information for International Travel, 2012
Hepatitis A Immunization

• Hepatitis A Vaccine
  – Inactivated vaccine whole virus vaccine (Vaqta®, Havrix®)
  – 2 dose series (0 & 6 months) provides life-long protection
  – Also available as combination Hep A/Hep B vaccine (Twinrix®)

• Hepatitis A Immune Globulin
  – Rarely necessary; one dose of vaccine anytime pre-travel provides protection in most healthy people
  – Consider for travelers departing within two weeks if:
    • Immune compromised
    • Chronic liver disease
    • Unable to receive hepatitis A vaccine
Typhoid Fever Vaccine

Geographic Distribution of Typhoid Fever

Typhoid Fever Vaccine

• Inactivated injectable vaccine (ViCPS, Typhim Vi®)
  – Single dose; booster every 2 years

• Live oral vaccine (Ty21a, Vivotif®)
  – 4 doses, 1 capsule every 48 hours; booster every 5 years
  – Must be refrigerated, take with cool liquids, avoid antibiotics immediately before and after

• Efficacy for both : 50-80%
Yellow Fever Vaccine

Geographic Distribution of Yellow Fever

* Yellow fever (YF) vaccination is generally not recommended in areas where there is low potential for YF virus exposure. However, vaccination might be considered for a small subset of travelers to those areas who are at increased risk for exposure to YF virus because of prolonged travel, heavy exposure to mosquitoes, or inability to avoid mosquito bites. Consideration for vaccination of any traveler must take into account the traveler’s risk of being infected with YF virus, country entry requirements, and individual risk factors for serious vaccine-associated adverse events (e.g., age, immune status).

CDC Health Information for International Travel, 2012
Yellow Fever Vaccine

• Vaccine Overview
  – Live virus vaccine (YF-VAX®)
  – Single dose; booster every 10 years (but likely to change)
  – Required for entry into several countries
    • Consider flight itinerary and transit through YF endemic countries
    • Provide waiver for those with vaccine contraindications

• Precautions
  – Caution in travelers > 60 years old
  – Avoid in breastfeeding mothers and patients with MS
  – Contraindicated in those with egg allergies, immunocompromised, thymus disorders (thymoma or myasthenia gravis), active malignancy
Yellow Fever Vaccine

- Complications
  - Vaccine-associated neurotropic disease
    - Meningoencephalitis, bulbar palsy, Bell’s palsy, GBS
    - 0.4 – 0.8 cases per 100,000 vaccine doses
  - Vaccine associated viscerotrophic disease
    - Similar to natural YF infection
    - 0.3 – 0.4 cases per 100,000 vaccine doses
    - 1.6/100,000 in first time vaccine recipients > 60 y/o
  - Meningoencephalitis in breastfeeding infants
  - 10x increased risk of multiple sclerosis relapse
Yellow Fever Vaccine

International Certificate of Vaccination
Meningococcal Vaccine

The “Meningitis Belt”

CDC Health Information for International Travel, 2012
Meningococcal Vaccine

- Quadrivalent (A,C,Y,W-135) vaccine; booster every 3-5 years

- Available as polysaccharide (Menomune®) and conjugate vaccines (Menactra®, Menveo®)

- Recommended for travel to the African meningitis belt
  - During high risk periods (Dec – Jun) for typical travelers
  - Year-round for those engaged in healthcare operations

- Required by Saudi Arabia for those entering the country for Hajj or Umrah pilgrimage
Polio Vaccine

- Inactivated virus vaccine

- Primary series and single adult booster recommended for travel to areas with recent or ongoing transmission

Polio Cases Last 12 Months

**Wild Poliovirus Cases**

<table>
<thead>
<tr>
<th>Country</th>
<th>Onset of most recent case (MMWR)</th>
<th>Number of cases</th>
<th>Total WPV (all types)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cameroon</td>
<td>08-Jun-14</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>04-May-14</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Nigeria</td>
<td>22-Feb-14</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>NFR</td>
<td>24-Jul-14</td>
<td>16</td>
<td>30</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>04-Oct-14</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>India</td>
<td>01-Aug-14</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Pakistan</td>
<td>26-Oct-14</td>
<td>32</td>
<td>268</td>
</tr>
<tr>
<td>Somalia</td>
<td>11-Aug-14</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Syria</td>
<td>24-Nov-14</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>NFR</td>
<td>29-Oct-14</td>
<td>67</td>
<td>366</td>
</tr>
<tr>
<td><strong>Global</strong></td>
<td>29-Oct-14</td>
<td>92</td>
<td>529</td>
</tr>
</tbody>
</table>

*Includes cases caused by vaccine-derived polioviruses and viruses detected from environmental surveillance.


Data on WPV type as of 04 November 2014.
Japanese Encephalitis Vaccine

• JE-VAX no longer available; inactivated vero-cell derived vaccine (Ixiaro®) licensed in 2009
• 2-dose series: day 0 and 28; booster after 1 year
• Licensed for use in age 2 months and older
• Recommended for:
  – Prolonged exposure in high risk regions (rural farming areas)
    • Duration > 1 month
    • Frequent short stays to high risk areas
    • Significant outdoor exposure (adventure travelers)
  – Rarely necessary for short itineraries or urban environments
Geographic Distribution of Japanese Encephalitis

CDC Health Information for International Travel, 2014
Hepatitis B Vaccine

- Inactivated viral antigen vaccine
- 3-dose series: 0, 1, and 6 months
- Recommended for:
  - Prolonged exposure in high risk regions
    - Duration > 3 months
    - Frequent short stays to high risk areas
  - High risk activities
    - Possibility of new sexual partner
    - Possibility of needing medical or dental care
    - Tattooing, body piercing, acupuncture
    - Healthcare workers
Rabies Vaccine

• Inactivated virus vaccine
• 3 dose series: 0, 7, and 21-28 days
• Post-exposure vaccine still required after exposure (2 doses)
• Recommended for:
  – Prolonged exposure in high risk regions
  – High risk activities
    • Potential exposure to animals (adventure travelers)
    • Occupational exposure
  – Other considerations
    • Young children
    • Limited access to medical care, remote locations
Routine Childhood Vaccinations

• Complete routine immunizations whenever possible
  – Don’t forget influenza vaccine!

• Early/accelerated schedules may be recommended
  – Hepatitis B, DTaP, HiB, PCV, rotavirus, polio

• Measles vaccination is an important consideration for all children traveling OCONUS
  – Children aged 6-11 months should receive 1 dose of MMR vaccine, followed by 2 additional doses after first birthday
  – Children aged ≥ 12 months should receive 2 doses of MMR vaccine, separated by ≥ 28 days
# Routine Adult Vaccinations

## ACIP Recommendations - 2014

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Flu Influenza</th>
<th>Td/Tdap</th>
<th>Shingles Zoster</th>
<th>Pneumococcal</th>
<th>Meningococcal</th>
<th>MMR Measles, mumps, rubella</th>
<th>HPV Human papillomavirus</th>
<th>Chickenpox Varicella</th>
<th>Hepatitis A</th>
<th>Hepatitis B</th>
<th>Hib Haemophilus influenzae type b</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 - 21 years</td>
<td></td>
<td></td>
<td></td>
<td>PCV13</td>
<td>PPSV23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 - 26 years</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 - 49 years</td>
<td>Flu vaccine every year</td>
<td>Td every 10 years</td>
<td>1 dose of Tdap*</td>
<td>1 dose</td>
<td>1 or 2 doses</td>
<td>1 or 2 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 - 59 years</td>
<td>Flu vaccine every year</td>
<td>Td booster every 10 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 - 64 years</td>
<td></td>
<td></td>
<td></td>
<td>PCV13</td>
<td>PPSV23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65+ years</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Recommended For You:* This vaccine is recommended for you unless your healthcare professional tells you that you cannot safely receive it or that you do not need it.

*May Be Recommended For You:* This vaccine is recommended for you if you have certain risk factors due to your health, job, or lifestyle that are not listed here. Talk to your healthcare professional to see if you need this vaccine.
The Pre-Travel Encounter

• Review of Itinerary and Medical History
• Immunizations
• Malaria Prophylaxis
• Self-Treatment Medications
• Personal Preventive Measures
Malaria Prevention

• Risk assessment is important
  – Risk can vary significantly within regions and countries
  – Risk changes over time

• No Vaccine - Chemoprophylaxis is the key!
  – Consider resistance trends
  – Understand precautions/contraindications
  – Encourage patients to follow dosing/duration

• Other preventive measures still important
  – Chemoprophylaxis is not 100% effective
  – Vectorborne diseases other than malaria
Malaria in US Travelers

<table>
<thead>
<tr>
<th>Category</th>
<th>No.</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visiting friends and relatives</td>
<td>607</td>
<td>(55.4)</td>
</tr>
<tr>
<td>Tourist</td>
<td>45</td>
<td>(4.1)</td>
</tr>
<tr>
<td>Missionary or dependent</td>
<td>96</td>
<td>(8.8)</td>
</tr>
<tr>
<td>Business representative</td>
<td>78</td>
<td>(7.1)</td>
</tr>
<tr>
<td>Student or teacher</td>
<td>32</td>
<td>(2.9)</td>
</tr>
<tr>
<td>Air crew or sailor</td>
<td>10</td>
<td>(0.9)</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>(0.3)</td>
</tr>
<tr>
<td>Unknown</td>
<td>224</td>
<td>(20.5)</td>
</tr>
</tbody>
</table>

* N=1,095

# Malaria Chemoprophylaxis

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dosing</th>
<th>Begin</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atovaquone-proguanil 250mg/100mg</td>
<td>Daily</td>
<td>1-2 days pre-travel</td>
<td>7 days post-travel</td>
</tr>
<tr>
<td>Mefloquine 250mg</td>
<td>Weekly</td>
<td>2-3 weeks pre-travel</td>
<td>4 weeks post-travel</td>
</tr>
<tr>
<td>Chloroquine 500mg</td>
<td>Weekly</td>
<td>1-2 weeks pre-travel</td>
<td>4 weeks post-travel</td>
</tr>
<tr>
<td>Doxycycline 100mg</td>
<td>Daily</td>
<td>1-2 days pre-travel</td>
<td>4 weeks post-travel</td>
</tr>
</tbody>
</table>

**Primaquine can be used off-label for prophylaxis**
# Malaria Chemoprophylaxis

<table>
<thead>
<tr>
<th>Medication</th>
<th>Precautions/Contraindications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atovaquone-proguanil</td>
<td>Pregnancy; breastfeeding a child &lt; 5kg; severe renal impairment</td>
</tr>
<tr>
<td>Mefloquine</td>
<td>Current/recent depression or anxiety; history of SI/HI, psychotic disorder or seizures</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>Pregnancy; age &lt; 8 y/o; women prone to yeast infections</td>
</tr>
</tbody>
</table>
DoD Policy on Mefloquine

HA Policy 13-002 Guidance on Medications for Prophylaxis of Malaria, 15 Apr 2013

• Chloroquine is the drug of choice for chloroquine-sensitive regions
• Atovaquone-proguanil or doxycycline are acceptable first line drugs for chloroquine-resistant regions
• Mefloquine should be reserved for individuals with intolerance or contraindications to both first line drugs
• Before prescribing mefloquine, be sure to identify any contraindications and ensure patient is provided FDA-required patient information handout
Chloroquine-Sensitive Regions

- Caribbean
  - Dominican Republic, Haiti
- Central America
  - Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua
- South America
  - Argentina, Paraguay (but malaria risk is LOW)
- Asia
  - Azerbaijan, Georgia, South Korea (but malaria risk is LOW)
Mefloquine Resistance

CDC Yellow Book, 2005-2006

CDC Yellow Book, 2012
The Pre-Travel Encounter

- Review of Itinerary and Medical History
- Immunizations
- Malaria Prophylaxis
- Self-Treatment Medications
- Personal Preventive Measures
Traveler’s Diarrhea - Causes

• Bacteria – 80-90%
  – Enterotoxigenic E. coli
  – Campylobacter
  – Shigella
  – Salmonella
  – Aeromonas
  – Plesiomonas

• Virus – 5-8%
  – Norovirus
  – Rotavirus

• Protozoan – <3%
  – Giardia
  – Cryptosporidium
  – Entamoeba histolytica
  – Cyclospora
Self-Treatment for Traveler’s Diarrhea

• Mild illness
  – Bismuth subsalicylate
• Moderate to severe illness
  – Loperamide plus antibiotic
    • Combination treatment is safe and effective
    • Safety with invasive disease (fever, blood) a concern
  – Fluoroquinolone: 1-3 days course
  – Azithromycin: 1 g single dose or 500mg daily for 1-3 days
    • 1st line antibiotic for Southeast Asia and South Asia (India, Nepal) due to fluoroquinolone resistance
Chemoprophylaxis for Traveler’s Diarrhea

• Bismuth subsalicylate
  – 2 oz. of liquid or 2 tablets taken 4 times per day
• Antibiotics
  – Generally NOT recommended
    • Self-treatment often results in rapid improvement
    • May increase risk of side effects (*C. difficile* colitis)
    • May contribute to antibiotic resistance
  – Possible uses
    • Immunosuppressed travelers
    • Medical conditions with risk for complications from TD (Crohn’s disease, ulcerative colitis, chronic diarrhea)
    • Critical travel in which illness would have significant impact
## Traveler’s Diarrhea Medications

### Table 6. Recommended agents for traveler’s diarrhea.

<table>
<thead>
<tr>
<th>Use, agent</th>
<th>Dosage</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prophylaxis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bismuth subsalicylate (Pepto Bismol)</td>
<td>Two tablets chewed 4 times per day</td>
<td>[168–170]</td>
</tr>
<tr>
<td>Norfloxacin&lt;sup&gt;b&lt;/sup&gt;</td>
<td>400 mg po daily</td>
<td>[171–173]</td>
</tr>
<tr>
<td>Ciprofloxacin&lt;sup&gt;b&lt;/sup&gt;</td>
<td>500 mg po daily</td>
<td>[174, 175]</td>
</tr>
<tr>
<td>Rifaximin</td>
<td>200 mg qd or bid</td>
<td>[176]</td>
</tr>
<tr>
<td><strong>Symptomatic treatment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bismuth subsalicylate (Pepto Bismol)</td>
<td>1 oz po every 30 min for 8 doses</td>
<td>[177]</td>
</tr>
<tr>
<td>Loperamide</td>
<td>4 mg po then 2 mg after each loose stool not to exceed 16 mg daily</td>
<td>[15, 178–180]</td>
</tr>
<tr>
<td><strong>Antibiotic treatment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluoroquinolones</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norfloxacin</td>
<td>400 mg po bid</td>
<td>[181–183]</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>500 mg po bid</td>
<td>[184–190]</td>
</tr>
<tr>
<td>Ofloxacin</td>
<td>200 mg po bid</td>
<td>[191–193]</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>500 mg po qd</td>
<td>[16]</td>
</tr>
<tr>
<td>Azithromycin</td>
<td>1000 mg po once</td>
<td>[16, 194]</td>
</tr>
<tr>
<td>Rifaximin&lt;sup&gt;o&lt;/sup&gt;</td>
<td>200 mg po tid</td>
<td>[17, 184, 195]</td>
</tr>
</tbody>
</table>

Hill DR. *Clin Inf Dis* (IDSA Guidelines) Dec 2006; 43:1499-1539
Altitude Sickness

- $PO_2$ at 10,000 feet is 70% of sea level value
- Illness results from mild to moderate hypoxia
- Symptoms can occur at altitudes above 8,000 feet
- Acute mountain sickness is the most common
  - Headache
  - Fatigue
  - Loss of appetite
  - Nausea
  - Insomnia
Altitude Sickness

- Prophylaxis: Acetazolamide 125mg BID, start 24 hrs before ascent, continue for 48 hrs at highest altitude
- Treatment: Acetazolamide 250mg BID
- Expected side effects: numbness/tingling in extremities, increased urination

<table>
<thead>
<tr>
<th>Patient History</th>
<th>Consider Prophylaxis</th>
<th>Prophylaxis Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past history of AS</td>
<td>8,000-9,000 ft</td>
<td>&gt;9,000 ft</td>
</tr>
<tr>
<td>No history of AS</td>
<td>9,000-11,500 ft</td>
<td>&gt;11,500 ft</td>
</tr>
</tbody>
</table>
Jet Lag

• Temporary disorder of the body’s sleep-wake cycle
• Symptoms can include:
  – Poor sleep, early wakening, fractionated sleep
  – Poor performance of physical and mental tasks
  – Fatigue, headaches, irritability, GI upset
• Strategies for prevention/treatment:
  – Adjust sleep time pre-travel
  – Use bright light to adjust sleep-wake cycle
  – Avoid long naps
  – Eat meals appropriate to local time
  – Medications: zolpidem (Ambien®), temazepam (Restoril®)
Other Self-Treatable Conditions

• Motion sickness
  – Antihistamines, scopolamine (oral or transdermal), meclizine, promethazine

• Recurring bacterial/fungal infections
  – Urinary tract infection
  – Vaginal yeast infection

• Common minor injuries/illnesses
  – Analgesic, decongestant, antibiotic ointment, mild laxative, antacid, throat lozenges
The Pre-Travel Encounter

- Review of Itinerary and Medical History
- Immunizations
- Malaria Prophylaxis
- Self-Treatable Conditions
- Personal Preventive Measures
Personal Preventive Measures

- Food/beverage precautions
- Hand hygiene
- Insect precautions
- Animal bite precautions
- Safety/security
- Freshwater avoidance
- Heat/cold Injuries
- Sexually transmitted infections
Food/Beverage Precautions

• Boil it, Peel it, or Forget it!.....But is that really possible?
Lower Risk Foods:

- Breads
- Fully cooked vegetables, beans and rice that are kept and served hot
- Boiled or well done meats (lamb, beef, poultry and fish) that are eaten within 2 hours after cooking
- Hard-skin fruits and vegetables that you peel yourself (bananas, oranges and limes)
- Hot tea
- Bottled water or canned carbonated drinks that you open yourself
Higher Risk Foods:

- Milk and other dairy products (cheese, ice cream and butter)
- Partially cooked or raw meats or fish
- Raw, leafy vegetables
- Leftovers, take-home, or doggie bags
- Opened/unsealed beverage containers
- Ice, iced drinks, frozen desserts and juices
- Locally canned or packaged products
Insect Precautions

Best Insect Repellants: DEET (30-40%) or Picaridin (20%)
Animal Bite Precautions

Fort Drum soldier dies of rabies

The Associated Press
Posted: Sunday Sep 4, 2011 15:14:18 EDT

FORT DRUM, N.Y. — A Fort Drum soldier has died of rabies believed to have been contracted during service overseas.

Officials at the northern New York Army base say Spc. Kevin R. Shumaker died on Wednesday.

According to a statement, the decorated 24-year-old soldier from Livermore, Calif., was from the 10th Mountain Division. He was an Army cook, and was deployed with the 615th Military Police Company in Afghanistan for a year that ended in May.

Exactly how and where he contracted the illness is under investigation. But military officials say he did not get the rabies in New York.

Shumaker is survived by his mother and stepfather.
Animal Bite Precautions

• Avoid animals!
  – Rabies can be highly prevalent in feral dogs and cats
  – Monkeys and bats (spelunking) also a source of exposure
  – Focus education/counseling on children
• If bitten by terrestrial mammal or bat:
  – Immediately wash wound with soap and water for several minutes
  – Seek medical attention as soon as possible
    • Rabies immune globulin plus vaccine needed if no pre-exposure vaccination given
    • Additional doses of vaccine required even if pre-travel vaccine was administered
Safety/Security

Leading Cause of Injury Death to US Citizens in Foreign Countries (2009-2011)

CDC Health Information for International Travel, 2014
Motor Vehicle Safety
Objectives

• Discuss the epidemiology of travel-related illness
• Review key elements of the pre-travel encounter
• Identify useful online travel medicine resources
Travel Medicine Resources

• CDC Travel Health Site (The Yellow Book)
  – www.cdc.gov/travel
• Shoreland® Travax
• National Center for Medical Intelligence
• DHA Immunization Healthcare Branch (MILVAX)
  – www.vaccines.mil
Questions?