OBJECTIVES: What you should take away

- Understand the 4 pillars of Travel Medicine
- Become familiar with the most recent outbreaks and their implications for patients traveling internationally
- Learn when to refer patients to a Travel Clinic

What is the most common cause of fatal injury to travelers?

- A
- B
- C
- D
- E
Helicopter Transport in London


121 foreigner transports
61% for pedestrians struck by a vehicle (16% of locals)
47% of these hit by a bus
16% mortality

Look both ways!

SAFETY: Streets

- Look both ways
- Seatbelts
- Helmets
- Car seats

Motivation predicts risk
Fun/Social >> more risk
Physical/Behavioral >> less risk

Home risk changes during spring break
Peer influences matter

Perceived difference from peers increased risk

Stephen Hargarten, MD, MPH


Safe Journey

Travel Med Infect Dis 12:385, 2014

Travel Med 15:95, 2008

Int J Inj Contr Saf Promot 17:161, 2010
What is the deadliest animal to humans in the world – that is, causes the greatest number of human deaths?

A. Snakes
B. Mosquitos
C. Sharks
D. Humans

Mosquito-Borne Illnesses – The ABCs

• Awareness of the risk
• Bite prevention
• Chemoprophylaxis

Awareness of Risk

Risk depends on:
• Specific location
• Season of travel
• Length of stay
• Activities
• Type of accommodation

Insect Repellants

- DEET: 20 to 50% concentration
  - 8 hours
  - Mosquitoes, ticks, flies, chiggers, fleas, gnats
- Picaridin: at least 20%
  - only ½ as protective
  - 8 hours
  - Mosquitoes and ticks
  - Lemon eucalyptus oil, paraquinate-diol, 2-undecanol

<table>
<thead>
<tr>
<th>Product</th>
<th>Duration of Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEET 24%</td>
<td>302 minutes</td>
</tr>
<tr>
<td>DEET 20%</td>
<td>234 minutes</td>
</tr>
<tr>
<td>DEET 7%</td>
<td>112 minutes</td>
</tr>
<tr>
<td>Citronella, 10%</td>
<td>20 minutes</td>
</tr>
<tr>
<td>Citronella, 0.05%</td>
<td>3 minutes</td>
</tr>
<tr>
<td>Picaridin</td>
<td>~ same as DEET</td>
</tr>
</tbody>
</table>
Two healthy surgeons (42 and 69 years of age) will be spending 2 weeks in Bomet, Kenya performing cardiac surgery at a medical mission hospital. The latter also plans to go on Safari for 2 days in the Serengeti. Is malaria chemoprophylaxis advisable?

A. Yes, for both
B. Yes, but only for the one going on safari
C. Neither need chemoprophylaxis for this trip
D. No idea

Malaria Risk by Destination

one month stay, no chemoprophylaxis

1:30 Oceania
1:50 Africa
1:250 South Asia
1:2,500 Southeast Asia
1:5,000 South America
1:10,000 Central America, Mexico
A 30 year old woman develops copious diarrhea while hiking the Annapurna range in Nepal. She is 13 weeks pregnant. What is the preferred treatment for this patient?

A. Azithromycin 1000 mg once
B. Ciprofloxacin 500mg BID x 3 days
C. Rifaximin 200 mg TID x 3 days
D. Oral fluids only
A 40 year old man is traveling to Iquitos, Peru, (Amazon jungle) for 2 weeks in June with his daughter’s middle school science class. He has no medical problems. He is up to date on routine immunizations for his age group. What vaccines would you recommend?

A. Typhoid
B. Hepatitis A
C. Yellow fever
D. All of the above
Typhoid fever

- Most commonly reported VPI in children in GeoSentinel
- Travel to South Asia (Pakistan, India, Nepal, Sri Lanka, Bangladesh) poses highest risk
- Being a child, VFR travel, and prolonged travel are additional risk factors

<table>
<thead>
<tr>
<th>Typhoid fever</th>
<th>Oral, live attenuated</th>
<th>Injectable, inactivated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route</td>
<td>Oral</td>
<td>IM</td>
</tr>
<tr>
<td>Dosage</td>
<td>QOD, 4 doses over 1 week</td>
<td>once</td>
</tr>
<tr>
<td>Duration</td>
<td>5 years</td>
<td>2 years</td>
</tr>
<tr>
<td>Pros</td>
<td>Duration</td>
<td>- Immunosuppressed</td>
</tr>
<tr>
<td></td>
<td>Children ≥ 3 y (liquid)</td>
<td>- Children &gt; 2 years</td>
</tr>
<tr>
<td></td>
<td>≥ 6 yr (capsule)</td>
<td>- Last-minute trips</td>
</tr>
<tr>
<td>Cons</td>
<td>- Refrigeration</td>
<td>Duration</td>
</tr>
<tr>
<td></td>
<td>- Inactivated by antibiotics</td>
<td></td>
</tr>
</tbody>
</table>

Yellow Fever

- Mosquito transmitted
- Often requires hospitalization
- Fever
- Flu-like symptoms
- Jaundice
- Bleeding from multiple body sites: liver, kidney, lungs
- Death (20% - 50% of serious cases)

Yellow Fever Vaccine

- May be required for entry into certain countries
- Given at certified clinics and pharmacies
- Patients given a stamped “yellow card”

https://www.cdc.gov/yellowfever/maps/index.html
### Yellow Fever Vaccine

#### Contraindications

<table>
<thead>
<tr>
<th>Contraindications</th>
<th>Precautions</th>
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</thead>
<tbody>
<tr>
<td>Allergy to vaccine component</td>
<td>Age 6–8 months</td>
</tr>
<tr>
<td>Age &lt;6 months</td>
<td>Age ≥60 years</td>
</tr>
<tr>
<td>Symptomatic HIV infection</td>
<td>Asymptomatic HIV infection</td>
</tr>
<tr>
<td>CD4 &lt;200/mm³</td>
<td>CD4 200–499/mm³</td>
</tr>
<tr>
<td>Thymus disorder associated with abnormal</td>
<td>Pregnancy</td>
</tr>
<tr>
<td>immune-cell function</td>
<td></td>
</tr>
<tr>
<td>Primary immunodeficiencies</td>
<td>Breastfeeding</td>
</tr>
<tr>
<td>Malignant neoplasms</td>
<td></td>
</tr>
<tr>
<td>Immunosuppressive drugs</td>
<td></td>
</tr>
</tbody>
</table>

#### Precautions

- Age <6 months
- Age ≥60 years
- Symptomatic HIV infection
- Thymus disorder associated with abnormal immune-cell function
- Primary immunodeficiencies
- Malignant neoplasms
- Immunosuppressive drugs
- Pregnancy
- Breastfeeding
- Infants 6-8 mo of age
- Acceptable immune responses without significant adverse events
- May give vaccine during outbreaks and travel to high risk areas
- Need to have a good understanding of current yellow fever epidemiology at destination

#### Yellow Fever Vaccine - Risks

- Yellow fever associated neurotropic disease (YEL-AND)
  - Encephalitis, Guillain-Barre, Bell’s Palsy
  - Rarely fatal
- Yellow fever associated viscerotropic disease (YEL-AVD)
  - Mimics severe yellow fever infection
  - 50% or greater fatality rate

#### Yellow Fever Vaccine - Update

- National shortage projected through January 2019
- Stamaril available in Milwaukee and Madison
- Patients in need of vaccine should be referred to a travel clinic

#### Yellow Fever Vaccine Recommendations

- Infant and child ≥9 mo of age: vaccinate
- Infant <6 mo of age
  - Never give the vaccine
  - “Can trip be deferred?”
- Infants 6-8 mo of age
  - Acceptable immune responses without significant adverse events
  - May give vaccine during outbreaks and travel to high risk areas
  - Need to have a good understanding of current yellow fever epidemiology at destination

#### Yellow Fever - Bottom line

Refer to a travel clinic for discussion of risks and benefits

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A healthy 22 year young man plans to backpack across rural areas of northern India and Nepal in June and July. He has no medical problems. He is up to date on routine immunizations for his age group. What vaccinations would you recommend?

A. Typhoid  
B. Hepatitis A  
C. Japanese encephalitis  
D. A and B  
E. All of the above

Name an illness for which this person is putting himself at risk.

Rabies

95% of reported rabies cases: Africa, Asia  
~50,000 – 55,000 rabies death annually (India)
Updating *Routine Vaccinations* is an important aspect of the Pre-Travel Consult!

Half (46%) of all Pediatric Travelers Received At Least One *Routine Vaccine*

Chikungunya 2013-2017
- > 2 million in the Americas
- Argentina, > 1000 in 2016
- Brazil, 385,000 cases
- Case fatality rate close to seasonal flu

Zika Virus

Zika: Updated Guidance, August 8, 2018

- Men with possible exposure: wait 3 months before engaging in unprotected sex
- Women with exposure: wait 2 months

Source: CDC

Proportion of Babies with Birth Defects

- Source: CDC

Zika in Early Pregnancy Increases Risk of Birth Defects

Supporting Healthcare Providers

- Guidance and recommendations
- Travel, testing and other recommendations for pregnant women
- Published updates to clinical guidance and algorithms for healthcare providers caring for pregnant women
- 24/7 Clinical hotline
  - Call 770-488-7100 and ask for the Zika Pregnancy Hotline
  - or email ZIKAMCH@cdc.gov
- Providers and the general public can also ask questions through CDC INFO
  - Call 1-800-CDC-INFO (1-800-232-4636) or visit www.cdc.gov/cdc-info

Ebola Virus as of December 29, 2018

STAT

Ebola outbreak shaping up as most dangerous test of world’s ability to respond since global crisis

© Tim Hume/Alamy Live News

August 25, 2018
Scientists Discover New Ebolavirus in Bats in Sierra Leone Currently No Evidence of Human Infection or Spillover

By Ali Koellis on July 27, 2018 in Human Animal Health

In summary (Keystone’s Travel Medicine Pearls)

• Don’t get HIT
• Don’t get LIT
• Don’t do IT
• Don’t get BIT
• Don’t eat s**t

Travel Health Clinic

• Patients planning travel with:
  – Complex medical comorbidities
  – Immunocompromising conditions
  – Destinations to yellow fever, malaria, Japanese encephalitis or rabies endemic areas
  – Medical care delivery or invasive procedures
  – Duration of travel > 2 weeks
  – Uncertain travel itinerary
• Symptomatic patients returning from international travel

References

CDC Yellow Book

Shoreland Travax
http://www.shoreland.com/services/travax

CDC
http://www.cdc.gov/travel/about/travelmedicine.html

References
References

Questions
jlsanchez@mcw.edu