Travel Medicine

How to Keep Your Patients Healthy While Vacationing

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DISCLOSURE INFORMATION

Travel Medicine
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I have no financial relationship to disclose.

I will discuss the following off-label use and/or investigational use in my presentation:
- off-label malaria prophylaxis
- off-label Travelers' Diarrhea prophylaxis
- off-label use of antihistamines in pediatrics

LEARNING OBJECTIVES

At the completion of this activity, the participant will be able to:

- **Discuss the basic pathophysiology and clinical course of common tropical diseases**
- **Develop a care plan for treatment of common tropical diseases**
- **Design an appropriate plan to help prevent tropical disease**
- **Discuss available references to aid in counseling about tropical disease and medications**

PRE-TEST

1. Which of the following areas has malaria that is typically sensitive to chloroquine?

a. The Caribbean
b. South America
c. Africa
d. Asia
e. All of the above

2. Which of the following vaccines is available in an oral form?

a. Yellow Fever
b. Bird Flu
c. Typhoid Fever
d. *Haemophilus influenzae*

PRE-TEST

3. What is the causative agent of MOST Traveler's Diarrhea?

a. *E. coli*
b. norovirus
c. *Giardia*
d. Roundworms

4. Which of the following MOST accurately reflects the recommended treatment period for mefloquine (Lariam®) for malaria prophylaxis?

a. Take every day starting one week before the trip, each day during the trip, and continue daily for 4 weeks after return home.

b. Take once a week starting one week before the trip, each week during the trip, and continue weekly for 4 weeks after return home.

c. Take twice a week starting one week before the trip, twice each week during the trip, and continue twice a week for 4 weeks after return home.

d. None. Mefloquine is not effective for malaria prophylaxis, only malaria treatment.

PRE-TEST

5. Which of the following is MOST CORRECT regarding the treatment of Traveler's Diarrhea?

a. loperamide can always be used safely for Traveler's Diarrhea

b. diphenoxylate/atropine can always be used safely for Traveler's Diarrhea

c. loperamide or diphenoxylate/atropine can be used safely if there is no blood in the stool.

d. loperamide or diphenoxylate/atropine should never be used for Traveler's Diarrhea

PRE-TRIP THOUGHTS

Reason for Trip

Destination(s)

Vaccination requirements

Prophylactic Medications

Altitude

Motion Sickness

Medications to take with you

INCIDENCE RATE PER MONTH IN DEVELOPING COUNTRIES

Traveler's Diarrhea: 20 - 60%

Malaria without chemoprophylaxis: 3%

PPD conversion: 0.4%

Malaria with chemoprophylaxis: 0.2%

Hepatitis A, Typhoid: < 0.1%

Hepatitis B, HIV, fatal accident: < 0.01%

Cholera, Legionella, Poliomyelitis: < 0.001%

Steffen R, Amitirigala I, Mutsch M. Health risks among travelers – need for regular updates. *J. Travel Med.* 2008;15(3): 145-6.

VACCINES

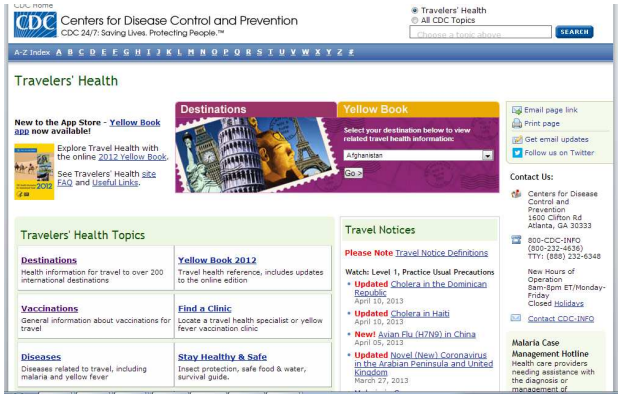
All patients considering international travel should be up to date on their routine vaccinations as determined by the CDC and Advisory Committee on Immunization Practices

These vaccines include:

- DTaP/Tdap
- Hepatitis A & B
- Influenza
- MMR
- Pneumococcal

Recommended vaccinations based on your destination

- http://www.cdc.gov/travel/



VACCINES (CONT)

Yellow Fever

- Documentation required for entrance to some countries

Typhoid Fever

- Oral (Vivotif®): every other day x 4 doses.
  - Repeat every 5 years
  - > 6 years old
- IM (Typhim Vi®): 0.5ml IM x 1 dose.
  - Repeat every 2 years
  - > 2 years old

TRAVELER'S DIARRHEA

Largely, but not entirely, preventable by following safe eating rules:

- If it's not from a sealed bottle, don't drink it
- No ice
- Don't eat from street vendors
- Fruits/veggies – only eat if you can peel it or it's been cooked
- Only eat at "tourist" restaurants

TRAVELER'S DIARRHEA (CONT)

Can be caused by bacteria (80-90%), viruses (5-8%), protozoa (8-10%)

Bacteria

- *E. coli* (most), *C. jejuni, Shigella, Salmonella*

Viral

- Norovirus, rotavirus, astrovirus

Protozoa

- *Giardia*

High Risk areas: most of Asia, Middle East, Africa, Mexico, Central and South America

TRAVELER'S DIARRHEA – PRESENTATION

Bacterial – sudden onset; malaise; mild-severe cramping/abdominal pain; urgent, loose stools; ± vomiting. 3-5 days untreated

Viral – fairly similar to bacteria. Increased vomiting possible. 2-3 days untreated

Protozoal – delayed onset (1-2 weeks), gradual onset of symptoms, belching, malaise, foul-smelling, fatty stools. Weeks-months untreated

TRAVELER'S DIARRHEA - TREATMENT

Rehydration

Antimotility agents

- Caution if fever > 101℉ or bloody diarrhea

Bacteria

- empiric treatment with FQ x 1-2 days or rifaximin (Xifaxan®) 200mg TID x 3 days or azithromycin 1gm x 1 dose or 500mg QD x 3-5 day

Protozoa

- Metronidazole, tinidazole, nitazoxanide

TRAVELER'S DIARRHEA - PROPHYLAXIS

Not routinely recommended unless immunocompromised

Bismuth subsalicylate (Pepto-Bismol®)

- 2 tabs QID or 60ml QID

Antibiotics – increased resistance limits effectiveness

Can try FQ, doxycycline, trimethoprim-sulfamethoxazole, rifaximin

Remember that early tx w/ antibiotics can limit duration of TD to 24 hours or less

MALARIA

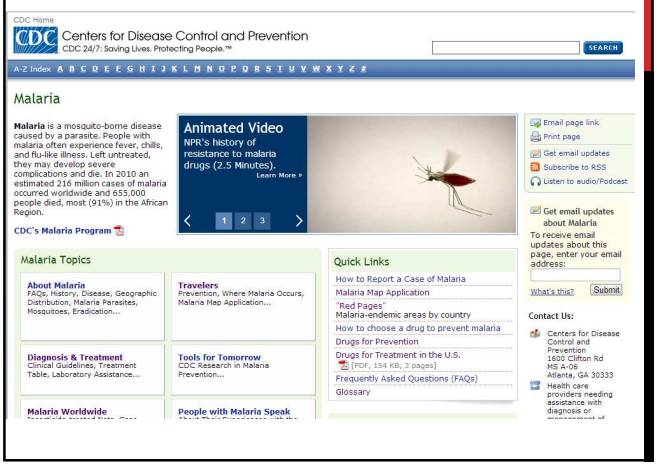
Caused by *Plasmodium* protozoa transmitted by the bite of the female *Anopheles* mosquito

Roughly 250-500 million infections per year worldwide

About 1000 cases per year in the US from travelers

Incidence varies greatly depending on country

http://www.cdc.gov/malaria/



MALARIA – PROPHYLAXIS

All regimens must be taken for a period of time prior to the trip, while on the trip, and a period of time after the trip

Some areas of the world show resistance to common antimalarials

Some areas of some countries may not have malaria present

Country	Areas with Malaria	Estimated relative risk of Malaria for US Travelers[2]	Drug Resistance[3]	Malaria Species[4]	Recommended Chemoprophlaxis[5]	Helpful links for Select Countries
Easter Island (Chile)	None	None	Not Applicable	Not Applicable	Not Applicable	
Ecuador; Including the Galápagos Islands	All areas at altitudes below 1,500 m (4,921 ft). Not present in the cities of Guayaquil, Quito, and the Galápagos Islands.	Low	Chloroquine	*P. vivax* 90% *P. falciparum* 10%	Atovaquone/proguanil, doxycycline, mefloquine, or primaquine[7]	Altitude information for Ecuador
Egypt	None	None	Not Applicable	Not Applicable	Not Applicable	
El Salvador	Rural areas of Santa Ana, Ahuachapan, and La Union departments.	Low	None	*P. vivax* 99% *P. falciparum* <1%	Atovaquone/ proguanil, chloroquine, doxycycline, mefloquine or primaquine[7]	Departments of El Salvador Cities and their respective departments in El Salvador
Equatorial Guinea	All	High	Chloroquine	*P. falciparum* 85% *P. malariae*, *P. ovale*, and *P. vivax* 15%	Atovaquone/ proguanil, doxycycline, or mefloquine	
Eritrea	All areas at altitudes below 2,200 m (7,218 ft). None in Asmara.	No data	Chloroquine	*P. falciparum* 85% *P. vivax* 10-15% *P. ovale* rare	Atovaquone/ proguanil, doxycycline, or mefloquine	Altitude information for Eritrea
Estonia	None	None	Not Applicable	Not Applicable	Not Applicable	
Ethiopia	All areas at altitudes below 2,500 m (8,202 ft) **except** none in Addis Ababa.	Moderate	Chloroquine	*P. falciparum* 85% *P. vivax* 10-15% *P. malariae*, *P. ovale* remainder	Atovaquone/ proguanil, doxycycline, or mefloquine	Altitude information for Ethiopia

1. The information presented herein was accurate at the time of publication; however, factors that can change rapidly and from year to year, such as local weather conditions, mosquito vector density, and prevalence of infection, can markedly affect local malaria transmission patterns. Updated information may be found on the CDC Travelers' Health website at www.cdc.gov/travel.
2. This estimate of risk is based on numbers of cases of malaria reported in US travelers and the estimated volume of travel to these countries. In some instances the risk may be low because the actual intensity of transmission is low in that country. In other instances, significant malaria transmission may occur only in small focal areas of the country where US travelers seldom go. Thus even though the risk for the average traveler to that country may be low, the risk for the rare traveler going to the areas with higher transmission intensity will of course be higher. For some countries that are rarely visited by US travelers, there is insufficient information to make a risk estimate.
3. Refers to *P. falciparum* malaria unless otherwise noted.

Example screenshot from http://www.cdc.gov/malaria/travelers/country_table/

MALARIA - PROPHYLAXIS

Atovaquone/Proguanil (Malarone®)

Begin 1-2 days before travel, during travel, and continue for 7 days after travel

Adults: 250mg/100mg tab QD

Peds: 62.5mg/25mg tabs available – wt based

Not recommended for pregnant, breastfeeding, or infants < 5kg

MALARIA - PROPHYLAXIS

Atovaquone/Proguanil Contraindications:

- CrCl < 30ml/min

Common Adverse Reactions

- Abdominal pain, N/V, headache

Caution with warfarin

Should be taken with food or milk-based product

Can crush tabs for peds and mix w/ condensed milk

MALARIA – PROPHYLAXIS

Chloroquine (Aralen®)

Begin 1-2 weeks before travel, during travel, and continue for 4 weeks after travel

Adults: 500mg once a week (same day)

Peds: 8.3mg/kg/week (same day)

Can use in pregnancy, breastfeeding, and infants

Widely resistant – can use only for travel to Caribbean, Central America, and few areas in Asia

MALARIA - PROPHYLAXIS

Chloroquine Contraindications

- QT prolongation
- Retinal/visual changes from prior use
- Psoriasis

Common Adverse Reactions

- GI upset, HA, dizziness

May take with food to avoid GI upset

Should monitor eyes and CBC with prolonged use

MALARIA - PROPHYLAXIS

Doxycycline

Begin 1-2 days before travel, during travel, and continue for 4 weeks after travel

Adults: 100mg once a day

Peds: > 8 yo: 2.2mg/kg/day

Do not use in pregnancy, breastfeeding, or < 8 years old

MALARIA – PROPHYLAXIS

Doxycycline Contraindications

- Pregnancy and peds < 8 years old

Common Adverse Reactions

- GI upset, diarrhea, photosensitivity, esophagitis

Take with meals if GI upset occurs

Remain upright for 30 min to prevent esophagitis

Sunscreen!!!

MALARIA – PROPHYLAXIS

Mefloquine (Lariam®)

Begin 1-2 weeks before travel, during travel, and continue for 4 weeks after travel

Adults: 250mg once a week

Peds: > 6 months old: once a week based on weight

Caution in pregnancy, breastfeeding, peds < 6 months old

Increasing resistance in some parts of the world

MALARIA - PROPHYLAXIS

Mefloquine Contraindications

- History of seizures
- History of psychiatric disorder

Common Adverse Reactions to Mefloquine

- GI upset, headache, insomnia, vivid dreams, dizziness, visual disturbances

Take with food and 8oz of water

Can be crushed and mixed in beverage

MOTION SICKNESS

Symptoms include nausea, vomiting, sweating, feeling of uneasiness, pallor

Anticholinergics/antihistamines are the treatment of choice

- Scopolamine patch - 1.5mg patch behind alternating ear every 3 days. Start > 4 hrs before travel
- Dimenhydrinate
  - Adults: 50-100mg every 4-6 hours up to 400mg/day
  - 6-12 yo: 25-50mg every 6-8 hours up to 150mg/day
  - 2-5 yo: 12.5-25mg every 6-8 hours up to 75mg/day
- Others

MOTION SICKNESS (CONT)

Contraindications of anticholinergic/ antihistamine therapy:

- Narrow-angle glaucoma
- Urinary retention
- GI obstruction
- Myasthenia gravis

Common Adverse Reactions:

- Dry mouth, drowsiness, blurred vision, thick respiratory secretions

Pregnancy/Lactation: Use with caution

Pediatrics: Not FDA indicated

TRAVEL MED CASE

A 29 year-old female brings a Rx for 10 tablets of Chloroquine 500mg. She is a chaperone on an upcoming missions trip for her church's High School and College age youth group. She would like to have the Rx filled and wonders if there is anything else she should have with her.

TRAVEL MED CASE

What questions should you ask her?

Is her Rx appropriate?

Is there anything else you'd recommend she take?

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KEY REFERENCES

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Traveler's Health by the CDC online. www.cdc.gov/travel/. Accessed 4/1/2013.

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