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I have made every attempt to only use generic names whenever possible, but I will discuss some brand names of medications and vaccines, including some off-label uses that are noted in the presentation.

I will also discuss a commercial subscription service, but I am being paid no money and have no financial interest in this (or any other) medical company.

No other conflicts of interest

Much of the advice herein applies to the developing ("tropical") setting where diseases of sanitation, poverty and environment are more common than in industrialized settings.

Focus today is on pre-travel counseling, not on Dx and Rx of tropical diseases.
So the short version, for those who have patients only traveling to Western Europe (and yes, you can leave after the section on Air Travel) —

- Look to the right when crossing the road
- Don't confuse soccer and football
- Avoid getting jealous at their long vacations (remember how much they pay in taxes and for gas)
- Learn to drive stick and to get out of the fast lane in Germany
- Avoid debates on who has the better health care system. Unfortunately, you will probably lose the argument...

**Statistics and general principles**

- Travel counseling framework
  - General advice and getting there
  - Safety concerns
  - Food and water safety
  - Things spread by mosquitoes and other insects
  - Things spread by other animals
  - Things spread by people
  - Other/miscellaneous
- Resources for providers

**Statistics**

- Over 700 million trips internationally each year
- Over 28 million Americans travel abroad each year
  - Western Europe 40%
  - Eastern Europe 4%
  - Caribbean 18%
  - South America 9%
  - Central America 7%
  - Africa 2%
  - Middle East 4%
  - Asia 19%
  - Australia 2%
Travel risks

- For every 100,000 travelers to developing countries:
  - 50,000 will have a health problem.
  - 8,000 will have to visit a physician.
  - 5,000 will have to stay in bed.
  - 300 will be hospitalized.
  - 50 will be air evacuated.
  - 1 will die.

Infectious travel-related conditions (per month of stay in developing country)

- Diarrheal (30%)
- Respiratory (2%)
- Malaria (2%)
- Hep A (0.5%)

General principles

- The most common concerns remain, predominantly, conditions they could have acquired anywhere
- Hundreds of uncommon conditions abound and it is impossible to cover them all in pre-travel counseling
- Their being uncommon still means general principles will likely cover them
- The most exotic stuff is also the least likely, so don't worry too much about Ebola

An Approach to counseling

- Assess risk based on
  - Location (as specific as possible)
  - Timing
    - What is the season
    - How long will they stay
  - Activities planned
    - Adventure travel
    - Visiting friends and relatives (VFR)
- General preventive principles
  - Wash hands frequently, and bring your own hand-sanitizer
- Specific concerns
The ideal pre-travel appointment

- Family comes to clinic about 6 weeks prior to trip
- They know their full itinerary
- They have their children’s complete medical records (including shot records)
- They have at least scheduled appointments with their primary pediatrician or specialists for any chronic medical issues

What usually happens... (at least in the military)

- They’re coming because they found out they can’t get orders cut until they’ve “got all the needed shots”
- They leave in 2 days
- They don’t know where they’re going to be staying
- They didn’t bring their shot record
- They didn’t think their child’s congenital heart defect or maybe the recent bone marrow transplant would be an issue, and they just want to go visit their grandparents in Uganda.

Typical starting questions

- Where are you going?
- What is the purpose of travel?
- How long will you be there for?
- Will you be in the city or the country? Hotel, home, or camping?
- Have you seen your other relevant doctors (e.g. cardiologist, transplant doctor?)
- Form an assessment of awareness and of risk

General advice

- Choose an appropriate travel companion
- Plan ahead: figure out medical and other backup resources
- Leave copies of itinerary with family or friends
- Consider travel insurance
In the plane

- Hydrate yourself and your kids
- Breast/bottle feed or use pacifier on descent for infants
- Activities to pass the time
- Meds in hand luggage (e.g. insulin or inhalers)
  - check with airlines about needles/liquids
  - Diphenhydramine for sleep aid? (be sure to test for paradoxical reaction prior to flight)

Safety measures

- Be aware of your surroundings
  - Petty crime is prevalent
  - Don’t announce you’re an American
- Always carry identification (but not always your passport)
- Know how to call:
  - Local contacts, family or friends
  - The US embassy
  - Long distance to the US

Motor vehicle safety

- >2 million killed in traffic accidents worldwide each year
  - Use extreme caution!
  - Unless very familiar with the local driving situation, do not drive
  - Children in the back seat
  - Appropriate child car seats or booster seats
  - Seat belts at all times
- Pedestrians
  - Stick to sidewalks when available
  - Yield to all vehicles
- Do not do what the locals do...

Before...
**Food and Water safety**
Boil it, cook it, peel it, or forget it!

The common sense approach

- NEVER trust tap water
- Clean water sources: Boiled > 'bottled' > 'purified' > 'filtered'
- Don't forget about ice cubes and toothbrushes
- Anything cooked thoroughly is safe
  - Fruits are safe if you can peel them
  - Washing vegetables does not remove risk
  - Avoid street vendors selling "meat on stick"
  - For sushi, stick to reputable places

**Backyard 'bottling plant' in Beijing**

**Filtering the water in Pakistan**
**Food and water-borne disease:**

- Intestinal parasites (amoebas, roundworms, tapeworms, flukes)
- Viruses (Hepatitis A, Norwalk agent, Rotavirus)
- Bacteria (ETEC, Campylobacter, Shigella, Salmonella)

  Among kids, those old enough to crawl are at highest risk of catching
  Youngest at highest risk of dehydration from diarrhea

**Intervention**

- Most watery and non-bloody diarrhea is self-limiting; use ORS/ORT to avoid dehydration
  - Continue breastfeeding
- If desired, may give empiric antimicrobials to start at first sign of traveler’s diarrhea
  - ciprofloxacin or rifaximin for those old enough
  - azithromycin 10mg/kg/day x 3 days for younger kids or if in area where there is concern for resistance to ciprofloxacin (e.g. campylobacter, typhoid in SE Asia)
- Avoid anti-motility agents (e.g. loperamide) in young children
- Empiric anti-parasitics is usually unnecessary

**Enteric Fever**

- Usually caused by Salmonella typhi or paratyphi
- Doesn't always present with diarrhea
- Vaccine options
  - Injectable: polysaccharide vaccine against Vi Ag (Typhim Vi)
    - single dose, for ages > 2 y/o, lasts for 2 years
    - Doesn't hurt as bad as the old phenol inactivated
    - Efficacy is not great (75-80% at best)
  - PO: live attenuated (Vivotif)
    - 4 doses (1 every other day), must be kept refrigerated
    - for ages > 6 y/o, lasts for 5 years
    - Better immunity (mucosal)

  **Vaccine is not a substitute for good food and water precautions**

**Things spread by mosquitoes (or other insects)**

- Best advice is to avoid getting bitten
  - Long protective clothing (possibly treated with permethrin if risk is high)
  - Sleep in air-conditioned or well screened hotels/houses or use permethrin treated bed nets
    - Make sure to tuck in bottom of net if loose
  - Use DEET liberally on areas of skin that are exposed
    - ~30% is best protection
Things spread by mosquitoes (or other insects)

- Too many to cover all, so concentrate on the most common, and the ones you can do something about
  - Malaria, Dengue, Yellow Fever, Japanese Encephalitis

  Vectors and their diseases
  - Mosquitoes: Dengue, Yellow Fever (Aedes); Malaria, lymphatic filariasis (Anopheles); Japanese Encephalitis, filariasis, West Nile fever (Culex)
  - Black flies: Onchocerciasis (River blindness)
  - Sandflies: Leishmaniasis
  - Tsetse flies: African Trypanosomiasis (sleeping sickness)
  - Triatomine bugs: American Trypanosomiasis (Chagas’ disease)
  - Ticks: Lyme, Q fever, encephalitis, Tularemia, Crimean-Congo Hemorrhagic Fever, various Rickettsial infections

Malaria

- Present in 100+ countries (but not in all cities of those countries)
- 12-15000 travelers get malaria annually
- Fever within 10 weeks of return from endemic area should cause concern
- Fever less than 7 days of first possible exposure is almost never malaria
- Falciparum malaria is the most dangerous and has the most resistance
- No vaccine, but chemoprophylaxis warranted
- >50% ask about it, but less than half follow the advice given.
### Chloroquine:
- 2 weeks prior to travel through 4 weeks after return.
- OK for breastfeeding, pregnant, young kids.
- Problems: may cause tinnitus and worsen psoriasis.

### Mefloquine:
- 2 weeks prior to travel through 4 weeks after return.
- OK for BF; limits on pregnancy (avoid during 1st trimester).
- Problems: psychiatric or convulsive disorders, vivid dreams, GI upset.

### Doxycycline:
- 2 days prior to travel through 4 weeks after return.
- NO to BF/kids<8/pregnancy.
- Problems: GI upset, pill esophagitis, sunburn; vaginal yeast infections; liver dysfunction.

### Atovaquone/proguanil (Malarone):
- 2 days prior to travel through 7 days after return.
- Problems: expensive, GI upset, not good data on safety during BF/pregnancy.

### Primaquine:
- Used for anti-relapse Rx against P. ovale and P. vivax (terminal prophylaxis) and occasionally for primary prophylaxis in the right circumstance. Must know G6PD status first. Dosing issues (15mg vs 30mg).

#### Suggested Algorithm for Pediatric Malaria Chemoprophylaxis
(no liquid formulations are available)

1. **Chloroquine Resistant Area**
   - Yes: **CQ**
   - No:
     - **Mefloquine Resistant Area, Seizures or psychiatric disease**
       - Yes: **Doxycycline (>8 years)**
       - No: **Malarone (>11 Kg)**
     - No: **MFQ (>5 Kg)**
**Dengue**

- Very common
- Spread by daytime biting mosquitoes
- Usually worse (Dengue hemorrhagic fever) the 2nd or 3rd time you get it
  - Most dangerous period occurs when the fever first breaks
- No vaccine and no prophylaxis

**Yellow Fever**

- Present in Africa and South America (not in Asia)
- Highly fatal when contracted
- Yellow fever vaccination is mandated before entering and when coming from a YF endemic country (even if in transit)
  - < 1/3 of those traveling to endemic areas get it

**Yellow Fever Vaccine**

- Live-attenuated virus
- May be given to ages > 9 m/o (ideally 10 days before a possible exposure)
- Good for 10 years
- Get stamped yellow certificate to show when entering a YFV-endemic country, or when entering any country after having been to YFV area
- Given at approved clinics (see list at www.cdc.gov/travel)
- Contraindicated if immunodeficiency or egg allergy
  - YFV in pregnancy "INDICATED IF EXPOSURE CANNOT BE AVOIDED" CDC Yellow Book
Majority of infections are asymptomatic or have a mild flu-like illness
Can result in severe brain damage and death
Transmission is seasonal in many countries and risk is generally low in urban areas or usual tourist sites

Japanese Encephalitis Vaccine
JE-Vax
- Inactivated vaccine (grown in mice)
- 3 doses, days 0, 7, 30
- Increased risk of allergic reaction (up to 10 days following a dose)
- Licensed for age > 1 y/o
- No longer manufactured (limited supply exists)

Ixiaro
- 2 doses, 4 weeks apart
- Risk of reaction is low
- Currently approved for ages > 17 y/o
- Projected to get pediatric indication in 2011

Things spread by other animals
- Much of the population in underdeveloped countries lives in close contact with livestock
- Best advice is to avoid contact with wild, stray, and sometimes domesticated animals
  - Easier said than done
  - Biggest concern is rabies, but sometimes people ask about bird flu
  - Bird flu has never been spread person to person
Rabies

- All mammals can carry, but it is generally only predatory animals that pass it on
- Predominate strain in the US is in bats
- Predominate strain in the rest of the world is in dogs
- Almost universally fatal, so must be prevented

Rabies

- If bitten/scratched by animal of concern:
  - Wash wound with soap and water (virus in lipophilic)
  - Seek medical attention immediately to get post-exposure prophylaxis
- Consider pre-exposure prophylaxis in high risk patients when rabies immune globulin (RIG) is unlikely to be available
  - Longer travel in hyper-endemic areas
  - Activities bring in close contact with animals
  - Toddlers

Rabies

Post-exposure prophylaxis

- 4 IM shots in deltid or mid/lateral thigh for small children on days: 0, 3, 7, & 14
- Give RIG concurrently with 1st dose of vaccine (or up to 7 days after if not immediately available)

Pre-exposure prophylaxis

- 3 IM shots in deltid or mid/lateral thigh for small children on days: 0, 7, & 21 or 28 days
- After exposure
  - give 2 more doses of vaccine on day 0 & 3
  - RIG is not needed
- If > 1 year since completing pre-exposure series, need to check titer

Things spread by people

- Best advice is to avoid ill-appearing people and high risk sexual activity for adolescents/older patients
  - It is also worth warning about the potentially unsafe blood supply should they require a transfusion
- Again, most common are not necessarily "tropical"
  - Think influenza, and give flu vaccine when available
- Also again, too many to cover every possibility, but I like to consider meningococcus, tuberculosis, and STIs
**N. meningitidis**
- Group A is hyper-endemic and frequently epidemic (especially during rainy season) in sub-Saharan Africa
- Saudi government requires vaccination for traveler’s participating in Hajj

**N. meningitidis**
- Polysaccharide vaccine (Menomune)  
  - Covers grps A, C, Y, & W-135  
  - Licensed down to age 2 y/o but occasionally given off label to younger kids for short term immunity if high risk  
  - Decreased immunity compared to conjugate vaccines
- Protein-conjugate vaccines (Menactra & Menveo)  
  - Covers grps A, C, Y, & W-135  
  - Routinely given in the US after age 11 y/o but Menactra is licensed down to age 2 y/o  
  - Increased immunity compared to polysaccharide vaccine

**Tuberculosis**
- Some advocate baseline TST or IGRA in all patients prior to travel
- I resist doing this pre-travel if no previous risk factors are present
  - Sometimes the DoD overseas school system requires it
- All traveler's to high risk areas should get a TST or IGRA approximately 3 months after return from travel
  - Sooner if known exposure

**STIs**
- Sexual tourism is real
- Latex condoms are reasonably safe but high-risk sex should be discouraged
- Risk of HIV and hepatitis (B and C in this case) may be much higher than in the US
- In addition, gonorrhea, chlamydia, syphilis are more common
  - (Unless you’re from Ft. Hood)
Other/misc.
- Other- e.g., Schisto, Cutaneous Larva Migrans
- Avoid swimming in fresh water in schisto (bilharzia) areas
  - Schistosomal cercaria can go right through your skin (and so can crocodiles)
- Avoid walking barefoot on the beach
- Follow safe hygiene practices

What about all those other vaccines?
- Anthrax: only for high-risk occupations e.g. military
- Cholera: killed; not generally recommended or available within the US; only partial, transient protection
- 'Pigbel' (enteritis necroticans): inactivated C. perfringens given to kids in Pacific islands eg Papua New Guinea
- Lyme disease: LymeRix pulled in 02
- Tick-born encephalitis: generally only available in Europe

You can't vaccinate kids against everything...

And they don’t always need every vaccine
Where can I find specifics?

- Control of Communicable Diseases Manual
- International Health Information for International Travelers 2010
- Journal of Travel Medicine

Useful Links

- Shoreland’s TRAVAX EnCompass (subscription service) www.travax.com
- CDC www.cdc.gov/travel
- WHO www.who.int/ith
- Medjet Assist 800-963-3538 www.medjetassist.com
- US Dept. of State www.travel.state.gov/travel/warnings.html travel warnings, consular information sheets, public announcements
Getting sick abroad

- Refer to list of approved providers (often available on TRAVAX)
- US Embassy
  - if you're in Iran, good luck
- Other local treatment centers (immediately if febrile and in a malarial area)

Final recommendations

- Keep the CDC travel, TRAVAX, or other websites on bookmarks
- Keep price list of vaccines (insurance does not usually cover the non-schedule ones), as well as a list of pharmacies which carry them
  - So I’m told because in the military I don’t have to worry about this

Closing thoughts:
Choose your destinations wisely

References

- [www.CDC.gov/travel](http://www.CDC.gov/travel)
- [www.travax.com](http://www.travax.com)
- International Travel & Health, World Health Organization
- ASTMH’s list of travel clinic and trop med/ travel health courses: [www.astmh.org](http://www.astmh.org)
- ISTM: International Society of Travel Medicine [www.istm.org](http://www.istm.org)