Preparing for travel

- What do I need to know before I travel?
  - What are my risks?
    - What/Who:
      - Organization
      - High risk groups
    - Where:
      - Remote area, Wilderness, Weather, Temperatures, Altitude
      - Conflict areas, Politically unstable regions
    - How:
      - How long: longer stays in remote areas increases health risks
      - How will I get there: Mode of travel
Preparing for travel continued

- What can I do to be safer?
  - Register yourself at the US State Department Website at https://step.state.gov/step/
  - Register with the US embassy upon arrival
  - Be aware of your surroundings
  - Keep a mental note of safe areas: police stations, hotels, hospitals
  - Always travel in pairs and let others know where you are going
  - Do not display cash in public areas
  - Conceal passports, credit cards and cash
Preparing for travel continued

- **What can I do to make things easier**
  - Jet Lag: according to the CDC “Jet lag can be a problem for travelers who are crossing several time zones. Although it is not a serious condition, jet lag can make it hard for you to enjoy your vacation for the first few days. For business travelers, who may be expected to travel long distances and start work immediately after arrival, jet lag can affect mood, ability to concentrate, and physical and mental performance. Fortunately, you can take steps to minimize the effects of jet lag.”
Before Travel

- Exercise, eat a healthful diet, and get plenty of rest.
- A few days before you leave, start going to bed an hour or two later than usual (before traveling west) or earlier than usual (before traveling east) to shift your body’s clock.
- Break up a long trip with a short stop in the middle, if possible.
Jet lag continued

- **During Travel**
  - Avoid large meals, alcohol, and caffeine
  - Drink plenty of water
  - On long flights, get up and walk around periodically
  - Sleep on the plane, if you can
Jet lag continued

- After You Arrive
  - Don’t make any important decisions the first day.
  - Eat meals at the appropriate local time.
  - Spend time in the sun.
  - Drink plenty of water, and avoid excess alcohol or caffeine.
  - If you are sleepy during the day, take short naps (20-30 minutes) so you can still sleep at night.
  - Talk to your doctor about taking medicine that help you sleep at night.
Motion Sickness

What else can I do to make things easier

- Motion Sickness: According to the CDC “Motion sickness results when the motion you see is different from the motion sensed by your inner ear. It can occur in a car, train, airplane, or boat. Anyone can get motion sickness, although children and pregnant women are especially vulnerable. It can cause dizziness, nausea, and vomiting, and although it is not a serious condition, motion sickness can make traveling very unpleasant.”
CDC recommendations on Motion Sickness

- Preventing Motion Sickness
  - In a car or bus, sit in the front (or drive, if possible). In an airplane, sit over the wing. On a cruise ship, try to get a central cabin. Close your eyes or focus them on the horizon. Stimulating your other senses can distract you from the motion. Aromatherapy (mint or lavender), ginger candy, or other flavored lozenges may help.
  - Medicines can be used to prevent or treat motion sickness, although many of them have the unwanted side effect of making you sleepy. Talk to your doctor about what is best for you if you think you need medicine for motion sickness. Commonly used medicines are diphenhydramine (Benadryl), dimenhydrinate (Dramamine), and scopolamine.
Deep Vein Thrombosis

- DVT
  - According to the CDC “More than 300 million people travel on long-distance flights (generally more than four hours) each year. Blood clots, also called deep vein thrombosis (DVT), can be a serious risk for some long-distance travelers. Most information about blood clots and long-distance travel comes from information that has been gathered about air travel. However, anyone traveling more than four hours, whether by air, car, bus, or train, can be at risk for blood clots.”
Most people who develop travel-associated blood clots have one or more other risks for blood clots, such as:
- Older age (risk increases after age 40)
- Obesity (body mass index [BMI] greater than 30kg/m²)
- Recent surgery or injury (within 3 months)
- Use of estrogen-containing contraceptives (for example, birth control pills, rings, patches)
- Hormone replacement therapy (medical treatment in which hormones are given to reduce the effects of menopause)
- Pregnancy and the postpartum period (up to 6 weeks after childbirth)
- Previous blood clot or a family history of blood clots
- Active cancer or recent cancer treatment
- Limited mobility (for example, a leg cast)
- Catheter placed in a large vein
- Varicose veins
DVT continued

- **DVT prevention**
  - Know the warning signs: swelling, pain or tenderness in leg or arm that can’t be explained, skin that is warm to touch, or redness
  - Know your risks factors: consider wearing compression stockings
  - “Move your legs frequently when on long trips and exercise your calf muscles to improve the flow of blood. If you’ve been sitting for a long time, take a break to stretch your legs. Extend your legs straight out and flex your ankles (pulling your toes toward you). Some airlines suggest pulling each knee up toward the chest and holding it there with your hands on your lower leg for 15 seconds, and repeat up to 10 times. These types of activities help to improve the flow of blood in your legs.”
What do I bring?

Things to keep in mind with foreign travel

- Luggage is often carried in open trucks or on top of buses. Rains can be harsh during the rainy season. Make sure that luggage is waterproof or pack things in plastic bags.
- Travel from major cities to smaller towns may require small airplane travel which has weight restrictions. In most cases there is 40 pound per person rule. Make sure to ask.
- Baggage delivery is unpredictable. Bring a change of clothes, water, snacks and 24-48 hours of essential personal supplies in your carry on bag.
- Do not let anyone help you with your luggage, there can be aggressive baggage handlers.
What to bring continued

- **Clothing**
  - Shorts, pants, skirts, shirts, undergarments (be sensitive to cultural norms, light weight/colored, long sleeved, mosquito repellant clothing)
  - Light weight rain gear
  - Sturdy walking shoes
  - Sandals or flip flops
  - Swim suit

- **Supplies**
  - Headlamp
  - Small personal fan
  - Ear plugs
  - Mosquito netting for sleeping
  - Towel for bathing
### What to bring continued

#### Personal Items
- US Dollars/Major credit card
- Passport/Visas/tourist cards
- Professional license
- Airline tickets/itinerary
- Reading material
- Sunscreen/Insect repellant (30%)
- Sunglasses
- Personal hygiene products
- Medical evacuation card
- Camera
- Extra batteries
- Toilet paper
- Small plastic trash bags
- Small pillow
- Ink pens
- Hand sanitizer (60%)/Disinfecting wipes
- Luggage lock

#### Medical supplies
- Stethoscope
- Otoscope
- Ophthalmoscope
- Sphygmomanometer
- Non-sterile gloves
- Tongue blades
- Seat cushion
- Copy of guidelines, travel medicine books.
- Personal and team medications
Personal and Team Medications

- Prescription medicines you usually take (plus copy of prescriptions)
- Epinephrine auto-injector
- Medicines to prevent malaria, if needed
- Antibiotic prescribed by your doctor for self-treatment of moderate to severe diarrhea
- Antidiarrheal medication (for example, bismuth subsalicylate, loperamide)
- Antihistamine
- Decongestant, alone or in combination with antihistamine
- Anti-motion sickness medication
- Medicine for pain or fever (such as acetaminophen, aspirin, or ibuprofen)
- Mild laxative
- Cough suppressant/expectorant
- Cough drops
- Antacid
- Antifungal and antibacterial ointments or creams, 1% hydrocortisone cream
Update on Immunizations

- First refer to the Center for Disease Control (CDC) and Prevention Travel Health website for current recommendations
  - [http://wwwnc.cdc.gov/Travel](http://wwwnc.cdc.gov/Travel)
- Get advice from a travel health clinic (at least 8 weeks before traveling)
- Don’t rely on advice from a travel agent
- Carry your vaccination card with you
Immunizations

- Update all childhood immunizations. Protection from some childhood vaccines can wear off over time.


- Every adult should get the Tdap vaccine once if they did not receive it as an adolescent to protect against pertussis (whooping cough), and then a Td (tetanus, diphtheria) booster shot every 10 years. In addition, women should get the Tdap vaccine each time they are pregnant, preferably at 27 through 36 weeks.

- You should get the flu vaccine every year.
Hepatitis A

- One dose of a monovalent hepatitis A vaccine protects most healthy people aged 1–40 years and should be administered as soon as travel is considered. The monovalent vaccine series should be completed according to the licensed schedule for long-term protection. No data on single-dose hepatitis A vaccine efficacy are available for Twinrix. An alternate, accelerated 4-dose schedule is available for Twinrix; doses can be administered at 0, 7, and 21–30 days, followed by a dose at 12 months.

- Hepatitis A vaccine at the age-appropriate dose is preferred to IG for children and adults aged 1–40 years. For optimal protection, adults aged >40 years, immunocompromised people, and people with chronic liver disease or other chronic medical conditions planning to depart to an area in <2 weeks should receive the initial dose of vaccine along with IG (0.02 mL/kg) at a separate injection site.
Hepatitis B

- All unvaccinated HCP should receive a 3-dose series of hepatitis B vaccine at 0, 1, and 6 months
- If anti-HBs is at least 10 mIU/mL (positive), the vaccinee is immune. No further serologic testing or vaccination is recommended.
- If anti-HBs is less than 10 mIU/mL (negative), the vaccinee is not protected from hepatitis B virus (HBV) infection, and should receive 3 additional doses of HepB vaccine on the routine schedule, followed by anti-HBs testing 1–2 months later. A vaccinee whose anti-HBs remains less than 10 mIU/mL after 6 doses is considered a “non-responder.”
- Non-responders should be considered susceptible to HBV and should be counseled regarding precautions to prevent HBV infection
Immunizations: Yellow Fever

- Proof of YELLOW FEVER vaccine may be required to cross certain international borders; in this case, the vaccine must be given at least 10 days before travel. A stamped vaccine certificate will be issued to you when you get the vaccine. Yellow fever vaccine can only be given by a registered provider.
Immunizations: Meningococcal Meningitis

- Vaccination is recommended in travelers staying >4 weeks and those staying in high risk settings and asplenic patients, given as a single dose, good for 3 years.
  - High risk areas for N. meningitides: prevalent in Nepal, Kenya, Northern Tanzania, India and Saudi Arabia (Mecca), and the rest of the African “meningitis belt”
Rabies

- “Viral illness transmitted in the saliva of infected animals: found in monkeys, dogs, rats, cats, foxes and wolves (not squirrels, rabbits.”
- Who should get the vaccine: International travelers who are likely to come in contact with animals in parts of the world where rabies is common.
- The pre-exposure schedule for rabies vaccination is 3 doses, given at the following times:
  - Dose 1: As appropriate
  - Dose 2: 7 days after Dose 1
  - Dose 3: 21 days or 28 days after Dose 1
- Post exposure: After being bitten, you will need Rabies immune globulin and post exposure vaccination (5 shots in 1 month) Very expensive $1500-2500
Immunizations: Cholera

- Cholera is caused by the bacteria Vibrio cholerae. It is rare in the United States. It is spread by ingestion of contaminated food or water from feces. The infection is often mild or without symptoms, but sometimes it can be severe and life threatening. Globally, cholera cases have increased steadily since 2005 and the disease still occurs in many places including Africa, Southeast Asia, and Haiti.

- The FDA recently approved a single-dose live oral cholera vaccine called Vaxchora (lyophilized CVD 103-HgR) for adults 18 – 64 years old who are traveling to an area of active cholera transmission. The vaccine is not routinely recommended for most travelers from the United States. Two other oral inactivated, or non-live cholera vaccines, Dukoral® and ShanChol®, are World Health Organization (WHO) prequalified, but these vaccines are not available in the U.S. No cholera vaccine is 100% protective and vaccination against cholera is not a substitute for standard prevention and control measures.
Malaria

- P. vivax causes about 95% of the malaria in Mexico and Central America, North Africa and the Middle East and India.
- P. falciparum causes 80-90% of malaria in sub-Saharan Africa, also common in Haiti, Dominican Republic, the Amazon basin and SE Asia.
  - Most serious and sometimes fatal form of malaria, due to the high percentage of blood cells that can be parasitized.
Malaria Prophylaxis

- Recommendations for drugs to prevent malaria differ by country of travel and can be found in the country-specific tables of the Yellow Book. Recommended drugs for each country are listed in alphabetical order and have comparable efficacy in that country.
- No antimalarial drug is 100% protective and must be combined with the use of personal protective measures, (i.e., insect repellent, long sleeves, long pants, sleeping in a mosquito-free setting or using an insecticide-treated bednet).
- For all medicines, also consider the possibility of drug-drug interactions with other medicines that the person might be taking as well as other medical contraindications, such as drug allergies.
- When several different drugs are recommended for an area, the following table might help in the decision process.
<table>
<thead>
<tr>
<th>Reasons that might make you consider using this drug</th>
<th>Reasons that might make you avoid using this drug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good for last-minute travelers because the drug is started 1-2 days before traveling to an area where malaria transmission occurs</td>
<td>Cannot be used by women who are pregnant or breastfeeding a child less than 5 kg</td>
</tr>
<tr>
<td>Some people prefer to take a daily medicine</td>
<td>Cannot be taken by people with severe renal impairment</td>
</tr>
<tr>
<td>Good choice for shorter trips because you only have to take the medicine for 7 days after traveling rather than 4 weeks</td>
<td>Tends to be more expensive than some of the other options (especially for trips of long duration)</td>
</tr>
<tr>
<td>Very well tolerated medicine – side effects uncommon</td>
<td>Some people (including children) would rather not take a medicine every day</td>
</tr>
<tr>
<td>Pediatric tablets are available and may be more convenient</td>
<td></td>
</tr>
</tbody>
</table>
Chloroquine

**Reasons that might make you consider using this drug**

- Some people would rather take medicine weekly
- Good choice for long trips because it is taken only weekly
- Some people are already taking hydroxychloroquine chronically for rheumatologic conditions. In those instances, they may not have to take an additional medicine
- Can be used in all trimesters of pregnancy

**Reasons that might make you avoid using this drug**

- Cannot be used in areas with chloroquine or mefloquine resistance
- May exacerbate psoriasis
- Some people would rather not take a weekly medication
- For trips of short duration, some people would rather not take medication for 4 weeks after travel
- Not a good choice for last-minute travelers because drug needs to be started 1-2 weeks prior to travel
Doxycycline

Reasons that might make you consider using this drug

- Some people prefer to take a daily medicine
- Good for last-minute travelers because the drug is started 1-2 days before traveling to an area where malaria transmission occurs
- Tends to be the least expensive antimalarial
- Some people are already taking doxycycline chronically for prevention of acne. In those instances, they do not have to take an additional medicine
- Doxycycline also can prevent some additional infections (e.g., Rickettsiae and leptospirosis) and so it may be preferred by people planning to do lots of hiking, camping, and wading and swimming in fresh water

Reasons that might make you avoid using this drug

- Cannot be used by pregnant women and children <8 years old
- Some people would rather not take a medicine every day
- For trips of short duration, some people would rather not take medication for 4 weeks after travel
- Women prone to getting vaginal yeast infections when taking antibiotics may prefer taking a different medicine
- Persons planning on considerable sun exposure may want to avoid the increased risk of sun sensitivity
- Some people are concerned about the potential of getting an upset stomach from doxycycline
Mefloquine (Lariam)

Reasons that might make you consider using this drug

- Some people would rather take medicine weekly
- Good choice for long trips because it is taken only weekly
- Can be used during pregnancy

Reasons that might make you avoid using this drug

- Cannot be used in areas with mefloquine resistance
- Cannot be used in patients with certain psychiatric conditions
- Cannot be used in patients with a seizure disorder
- Not recommended for persons with cardiac conduction abnormalities
- Not a good choice for last-minute travelers because drug needs to be started at least 2 weeks prior to travel
- Some people would rather not take a weekly medication
- For trips of short duration, some people would rather not take medication for 4 weeks after travel
Primaquine

**Reasons that might make you consider using this drug**

- It is the most effective medicine for preventing P. vivax and so it is a good choice for travel to places with > 90% P. vivax
- Good choice for shorter trips because you only have to take the medicine for 7 days after traveling rather than 4 weeks
- Good for last-minute travelers because the drug is started 1-2 days before traveling to an area where malaria transmission occurs
- Some people prefer to take a daily medicine

**Reasons that might make you avoid using this drug**

- Cannot be used in patients with glucose-6-phosphatase dehydrogenase (G6PD) deficiency
- Cannot be used in patients who have not been tested for G6PD deficiency
- There are costs and delays associated with getting a G6PD test done; however, it only has to be done once. Once a normal G6PD level is verified and documented, the test does not have to be repeated the next time primaquine is considered
- Cannot be used by pregnant women
- Cannot be used by women who are breastfeeding unless the infant has also been tested for G6PD deficiency
- Some people (including children) would rather not take a medicine every day
- Some people are concerned about the potential of getting an upset stomach from primaquine
Dengue Fever

- Dengue (pronounced den’ gee) is a disease caused by any one of four closely related dengue viruses (DENV 1, DENV 2, DENV 3, or DENV 4). The viruses are transmitted to humans by the bite of an infected mosquito. In the Western Hemisphere, the Aedes aegypti mosquito is the most important transmitter or vector of dengue viruses, although a 2001 outbreak in Hawaii was transmitted by Aedes albopictus. It is estimated that there are over 100 million cases of dengue worldwide each year.

- The geographical spread is similar to malaria, however, dengue is often found in urban area of tropical nations.
The principal symptoms of dengue fever are high fever, severe headache, severe pain behind the eyes, joint pain, muscle and bone pain (break-bone fever or bonecrusher disease), rash (bright red petechiae and usually appears first on the lower limbs and chest then spread to rest of body, and mild bleeding (nose or gums bleed, easy bruising). Generally, younger children and those with their first dengue infection have a milder illness than older children and adults.
The WHO definition (all 4 of the following to be present):
- Fever, bladder problem, constant headaches, severe dizziness and loss of appetite.
- Petechia and hemorrhagic lesions (spontaneous bruising, bleeding from mucosa, gingiva, injection sites, vomiting blood or bloody diarrhea.
- Thrombocytopenia (<100,000 platelets per mm³)
- Evidence of plasma leakage (hematocrit more than 20% higher than expected, or drop in hematocrit of 20% or more from baseline following IV fluid, hypoproteinemia, axcites)
Dengue Fever and DHF treatment

- There is no specific medication for treatment of a dengue infection. Persons who think they have dengue should use analgesics (pain relievers) with acetaminophen and avoid those containing aspirin. They should also rest, drink plenty of fluids, and consult a physician. If they feel worse (e.g., develop vomiting and severe abdominal pain) in the first 24 hours after the fever declines, they should go immediately to the hospital for evaluation.
Chikungunya

- Chikungunya virus is primarily transmitted to humans through the bites of infected mosquitoes, predominantly Aedes aegypti and Aedes albopictus. Humans are the primary host of chikungunya virus during epidemic periods. Blood-borne transmission is possible; cases have been documented among laboratory personnel handling infected blood and a health care worker drawing blood from an infected patient. Rare in utero transmission has been documented mostly during the second trimester. Intrapartum transmission has also been documented when the mother was viremic around the time of delivery. Studies have not found chikungunya virus in breast milk and there have been no reports to date of infants acquiring chikungunya virus infection through breastfeeding. Because the benefits of breastfeeding likely outweigh the risk of chikungunya virus infection in breastfeeding infants, mothers should be encouraged to breastfeed even if they are infected with chikungunya virus or live in an area with ongoing virus transmission.
Geographic Distribution

- Prior to 2013, chikungunya virus outbreaks had been identified in countries in Africa, Asia, Europe, and the Indian and Pacific Oceans.
- In late 2013, the first local transmission of chikungunya virus in the Americas was identified in Caribbean countries and territories. Local transmission means that mosquitoes in the area have been infected with the virus and are spreading it to people.
- Since then, local transmission has been identified in 45 countries or territories throughout the Americas with more than 1.7 million suspected cases reported to the Pan American Health Organization from affected areas.
Chikungunya Symptoms

- The majority of people infected with chikungunya virus become symptomatic. The incubation period is typically 3–7 days (range, 1–12 days). The disease is most often characterized by acute onset of fever (typically >39°C [102°F]) and polyarthralgia. Joint symptoms are usually bilateral and symmetric, and can be severe and debilitating. Other symptoms may include headache, myalgia, arthritis, conjunctivitis, nausea/vomiting, or maculopapular rash. Clinical laboratory findings can include lymphopenia, thrombocytopenia, elevated creatinine, and elevated hepatic transaminases.

- Acute symptoms typically resolve within 7–10 days.
Chikungunya Treatment

- There is no specific antiviral therapy for chikungunya virus infection. Treatment is for symptoms and can include rest, fluids, and use of non-steroidal anti-inflammatory drugs (NSAIDs) to relieve acute pain and fever. Persistent joint pain may benefit from use of NSAIDs, corticosteroids, or physiotherapy. People infected with chikungunya should be protected from further mosquito exposure during the first week of illness to reduce the risk of local transmission.
Zika

What we know

- Zika is spread mostly by the bite of an infected Aedes species mosquito (Ae. aegypti and Ae. albopictus). These mosquitoes bite during the day and night. (Aedes genus can breed in a pool of water as small as a bottle cap).
- Zika can be passed from a pregnant woman to her fetus. Infection during pregnancy can cause certain birth defects.
- Zika virus can also be sexually transmitted (only three reports).
- There is no vaccine or medicine for Zika.
- Local mosquito-borne Zika virus transmission has been reported in the continental United States (Florida, along the Gulf Coast, and Hawaii – has been as far north as Washington, DC in hot weather.)
Zika Symptoms

- Many people infected with Zika virus won’t have symptoms or will only have mild symptoms. The most common symptoms of Zika are
  - Fever
  - Rash
  - Headache
  - Joint pain
  - Red eyes
  - Muscle pain
- Symptoms can last for several days to a week. People usually don’t get sick enough to go to the hospital, and they very rarely die of Zika. Once a person has been infected with Zika, they are likely to be protected from future infections.
Zika virus disease is a nationally notifiable condition. Healthcare providers should report suspected Zika virus disease cases to their state, local, or territorial health department to facilitate diagnosis and mitigate risk of local transmission. State, local, and territorial health departments should report laboratory-confirmed and probable cases to CDC.

- A blood or urine test can confirm Zika infection diagnosis.
- There is no specific medicine for Zika.
Recommendations for Pregnancy

- Offer serologic testing to pregnant women without Zika fever symptoms who have returned from areas with ongoing Zika virus transmission in the last 2-12 weeks; and for pregnant women without Zika symptoms living in such areas, they recommend testing at the beginning of prenatal care and follow-up testing in the 5th month of pregnancy.
Effective vaccines exist for several flaviviruses. Vaccines for yellow fever virus, Japanese encephalitis, and tick-borne encephalitis were introduced in the 1930’s, while vaccine for dengue fever only became available for use in the mid 2010’s. Work has begun in the US towards developing a vaccine for the Zika virus, according to Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases.
“Travelers’ diarrhea (TD) is the most predictable travel-related illness. Attack rates range from 30% to 70% of travelers, depending on the destination and season of travel. Traditionally, it was thought that TD could be prevented by following simple recommendations such as “boil it, cook it, peel it, or forget it,” but studies have found that people who follow these rules may still become ill. Poor hygiene practice in local restaurants is likely the largest contributor to the risk for TD.”

“TD is a clinical syndrome that can result from a variety of intestinal pathogens. Bacterial pathogens are the predominant risk, thought to account for up to 80%–90% of TD. Intestinal viruses usually account for at least 5%–8% of illnesses, although improved diagnostics may increase recognition of norovirus infections in the future. Infections with protozoal pathogens are slower to manifest symptoms and collectively account for approximately 10% of diagnoses in longer-term travelers. What is commonly known as “food poisoning” involves the ingestion of preformed toxins in food. In this syndrome, vomiting and diarrhea may both be present, but symptoms usually resolve spontaneously within 12 hours.”
Bacterial Infections

- Bacteria are the most common cause of TD. Overall, the most common pathogen is enterotoxigenic Escherichia coli, followed by Campylobacter jejuni, Shigella spp., and Salmonella spp. Enteroaggregative and other E. coli pathotypes are also commonly found in cases of TD. There is increasing discussion of Aeromonas spp., Plesiomonas spp., and newly recognized pathogens (Acrobacter, Larobacter, enterotoxigenic Bacteroides fragilis) as potential causes of TD as well.

- Bacterial toxins generally cause symptoms within a few hour

- Untreated bacterial diarrhea usually lasts 3–7 days.
Antibiotics are effective in reducing the duration of diarrhea by about a day in cases caused by bacterial pathogens that are susceptible to the particular antibiotic prescribed.

As empiric therapy or to treat a specific bacterial pathogen, first-line antibiotics have traditionally been the fluoroquinolones, such as ciprofloxacin or levofloxacin. Increasing microbial resistance to the fluoroquinolones, especially among Campylobacter isolates, may limit their usefulness in many destinations, particularly South and Southeast Asia.

A potential alternative to fluoroquinolones is azithromycin, although enteropathogens with decreased azithromycin susceptibility have been documented in several countries.

Single-dose regimens are equivalent to multidose regimens and may be more convenient for the traveler. Single-dose therapy with a fluoroquinolone is well established, both by clinical trials and clinical experience. The best regimen for azithromycin treatment may also be a single dose of 1,000 mg, but side effects (mainly nausea) may limit the acceptability of this large dose. Giving azithromycin as 2 divided doses on the same day may limit this adverse event.
TD Treatment

- Loperamide (Imodium) 4 mg plus:
  - Azithromycin
    - Single dose: 1000 mg once
    - Multiple dose: 500 mg QD x 2-3 days
  - Ciprofloxacin
    - Single dose: 750 mg once
    - Multiple dose: 500 mg BID x 2-3 days
  - Levofloxacin
    - Single dose: 500 mg once
    - Multiple dose: 500 mg QD x 2-3 days
Viral Diarrhea

- Viral diarrhea can be caused by a number of pathogens, including norovirus, rotavirus, and astrovirus.
- Bacterial and viral pathogens have an incubation period of 6–72 hours.
- Viral diarrhea generally lasts 2–3 days.
Protozoal Pathogen

- Giardia is the main protozoal pathogen found in TD. Entamoeba histolytica is a relatively uncommon cause of TD, and Cryptosporidium is also relatively uncommon. The risk for Cyclospora is highly geographic and seasonal: the most well-known risks are in Nepal, Peru, Haiti, and Guatemala. Dientamoeba fragilis is a flagellate occasionally associated with diarrhea in travelers.

- Protozoal pathogens generally have an incubation period of 1–2 weeks and rarely present in the first few days of travel. An exception can be Cyclospora cayetanensis, which can present quickly in areas of high risk.

- Protozoal diarrhea can persist for weeks to months without treatment.
The most common parasitic cause of TD is Giardia intestinalis, and treatment options include metronidazole, tinidazole, and nitazoxanid. Although cryptosporidiosis is usually a self-limited illness in immunocompetent people, nitazoxanid can be considered as a treatment option. Cyclosporiasis is treated with trimethoprim-sulfamethoxazole. Treatment of amebiasis is with metronidazole or tinidazole, followed by treatment with a luminal agent such as iodoquinol or paromomycin.
Giardia

- **Tinidazole (Fasigyn, Tiniba)**
  - Drug of choice where available
  - Adults: 2 gm single dose
  - Children 30-35 mg/kg single dose
  - 90-95% cure rate

- **Nitazoxanide (Alinia)**
  - 500 mg BID x 3 days
  - 91% cure rate

- **Metronidazole (Flagyl)**
  - 500 mg BID x 5 days
  - 80% cure rate
Diarrhea Treatment

- **Oral rehydration:** replacement of fluid losses remains an adjunct to other therapy and helps the traveler feel better more quickly. For severe fluid loss, replacement is best accomplished with oral rehydration solution (ORS) prepared from packaged oral rehydration salts.

- **Anti-motility agents:** provide symptomatic relief and are useful therapy in TD. Synthetic opiates, such as loperamide and diphenoxylate, can reduce frequency of bowel movements and therefore enable travelers to ride on an airplane or bus.
Diarrhea Prevention

- Prevention: The primary agent studied for prevention of TD, other than antimicrobial drugs, is bismuth subsalicylate (BSS), which is the active ingredient in adult formulations of Pepto-Bismol and Kaopectate. Studies from Mexico have shown that this agent (taken daily as either 2 oz of liquid or 2 chewable tablets 4 times per day) reduces the incidence of TD by approximately 50%.

- BSS should be avoided by travelers with aspirin allergy, renal insufficiency, and gout, and by those taking anticoagulants, probenecid, or methotrexate.
The End