TravelHealth Pocket Guide

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APhA

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Acknowledgements

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Vaccine Travel Considerations:

These routine vaccines warrant special attention when a patient plans to travel: Ensure all patients are up to date on routine adult or age-appropriate pediatric vaccines (polio, influenza, varicella, MMR, and others). To access the age-appropriate schedule for routine vaccines, please visit the CDC website: https://www.cdc.gov/vaccines/schedules/index.html. Routine vaccines with travel-specific indications or considerations are discussed below. Combination vaccines are encouraged when appropriate. Use of the CDC Catch-up Immunization Schedule may be necessary for patients who are un/under-vaccinated.

1. **Hepatitis A Vaccine:** for all susceptible persons traveling to or working in countries that have high or intermediate rates of hepatitis A before traveling.
    - Hepatitis A vaccine is given in two doses. If travel plans don't allow for the individual to get all doses before the trip, get at least 1 dose, as soon as possible before travel.
    - Children aged 6-11 months should receive one dose when traveling outside the United States to an area of risk.
        - These patients should be re-vaccinated with the routine 2-dose schedule recommended at 12-23 months of age.
    - Unvaccinated children ages ≥ 1 year should receive an age-appropriate dose of hepatitis A vaccine, as soon as travel is considered.
    - The initial dose of vaccine along with IM immune globulin at a separate injection site is recommended for the following travelers who are planning to depart to an area of risk in < 2 weeks: adults aged > 40 years, immunocompromised people, people with chronic liver disease, people with other chronic medical conditions.
    - Persons who are unable to receive the hepatitis A vaccine, including those who are allergic to the vaccine & children < 6 months, should receive a single dose of immune globulin, which provides up to 2 months of protection.
2. **Hepatitis B Vaccine:** for all unvaccinated persons traveling to areas with intermediate to high prevalence of chronic hepatitis B (HBsAg prevalence ≥ 2%).
    - Vaccination to prevent hepatitis B may be considered for all international travelers, regardless of destination, depending on the traveler's behavioral risk or chronic disease diagnosis.
    - Recombinant hepatitis B vaccination should ideally begin ≥ 6 months before travel so the full 3-dose vaccine series can be completed before departure.
        - An accelerated dosing schedule may be considered for patients at significant risk if there is not sufficient time to complete the series before departure.
        - For lower-risk patients, 1 or 2 doses may be administered before departure, but optimal protection is reliable only after the complete series.
        - Adult patients receiving hemodialysis or with other immunocompromising conditions: consult package insert for differences in dosing.
    - Adjuvanted hepatitis B vaccine is only for adults ≥ 18 years of age.
        - 2-dose series ≥ 4 weeks apart (*both doses must be adjuvant formulation;* if not, a 3-dose series is necessary).
        - There may be diminished immune response in immunocompromised patients.

3. **Meningococcal Vaccine:** for persons who travel to countries where meningococcal disease is endemic or epidemic, including the Sub-Saharan Africa meningitis belt during the dry season (Dec–June). Travelers who spend a lot of time with local populations, especially during outbreaks, have the highest risk of getting sick. Proof of vaccination within 3 years for the polysaccharide or within 5 years for the conjugated vaccine is required for entry into Saudi Arabia traveling to Mecca during Hajj & Umrah pilgrimages.
    - Administer a single dose of MenACWY vaccine, then revaccinate with MenACWY vaccine every 5 years if an increased risk for infection remains.
    - Infants/children who received Hib-MenCY-TT are not protected against serogroups A & W and should receive the quadrivalent vaccine before traveling to high endemic areas.
    - Children who received their last dose at < 7 years of age should receive an additional dose of MenACWY 3 years after their last dose.
    - MenACWY dosing schedule & number of doses are dependent on age & product administered; consult package insert.
    - MenB vaccine is not recommended as a travel vaccine due to low risk of meningococcal disease caused by serogroup B in these countries, unless the patient is believed to be at high risk for another reason (e.g., international exchange students in dorms/hostels, military barracks), in which case ACIP recommends shared clinical decision making to determine if vaccination is warranted.

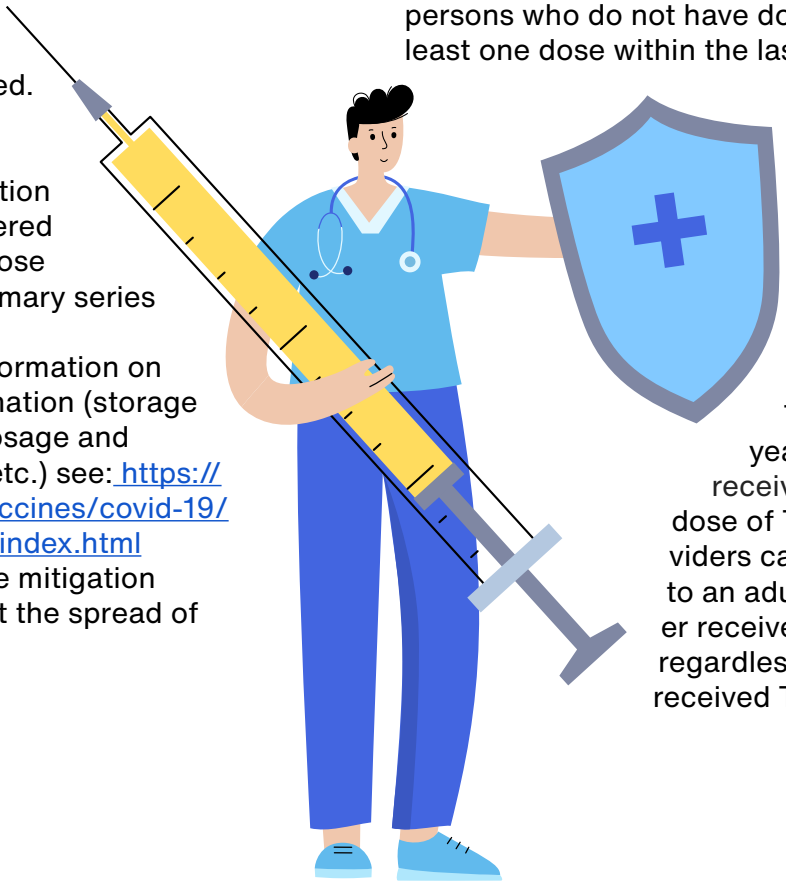
4. **SARS-CoV-2 Vaccine:** for age-appropriate approved persons in the United States traveling domestically or internationally. Please check updates as recommendations are changing frequently. Some countries may not accept all vaccines and documentation may be required.
    - Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus. It can spread from person to person and the severity of the disease varies by individual and their underlying health conditions.
    - CDC Interim COVID-19 Immunization Schedule (as of October 21, 2022, check https://www.cdc.gov/vaccines/covid-19/index.html for most recent updates)
        - Moderna (mRNA) vaccine
            - Age ≥ 6 months - 5 years
                - Primary series: 2 doses **MONO**valent ≥ 4-8 weeks apart
            - Age ≥ 6 years
                - Primary series: 2 doses **MONO**valent ≥ 4-8 weeks apart
                - Booster: 1 dose **BI**valent ≥ 8 weeks after primary series complete
        - Pfizer/BioNTech (mRNA) vaccine
            - Age ≥ 6 months - 4 years
                - Primary series: 3 doses **MONO**valent at 0, 3-8 weeks, and 16 weeks
            - Age ≥ 5 years
                - Primary series: 2 doses **MONO**valent ≥ 3-8 weeks apart
                - Booster: 1 dose **BI**valent ≥ 8 weeks after primary series complete
        - Novavax (protein subunit) vaccine
            - Age ≥ 12 years
                - Primary series: 2 doses **MONO**valent ≥ 3-8 weeks apart
                - Booster: 1 dose Moderna or Pfizer/BioNTech **BI**valent ≥ 8 weeks after primary series complete

- Janssen/Johnson & Johnson (adenovirus vector) vaccine - authorized for use only in certain limited situations - see https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us-appendix.html#appendix-a
  - Age ≥ 18 years
    - **Primary:** 1 dose **MONO**valent
    - **Booster:** 1 dose Moderna or Pfizer/BioNTech **BI**valent ≥ 8 weeks after primary series complete
- Patients who are moderately or severely immunocompromised receiving a Moderna or Pfizer/BioNTech (mRNA) product should receive a 3rd primary (**MONO**valent) dose ≥ 4 weeks after their second primary dose, followed by the **BI**valent booster ≥ 8 weeks after the primary series complete (if eligible).
- The primary series should be completed with the same brand/type unless prior vaccination brand/type is unknown, no longer available, or contraindicated.
- The Moderna or Pfizer/BioNTech **BI**valent formulation can be administered as the booster dose regardless of primary series brand/type.
- For complete information on COVID-19 vaccination (storage and handling, dosage and administration, etc.) see: https://www.cdc.gov/vaccines/covid-19/info-by-product/index.html

- **Prevention:** there are mitigation strategies to prevent the spread of SARS CoV-2
  - Get vaccinated
  - Wear a mask
  - Wash hands frequently
  - Stay away from those who are ill and socially distance from others outside of home
  - Avoid crowded areas that are poorly ventilated
  - Cover coughs and sneezing
  - Clean and disinfect high common touch areas
  - Be aware of symptoms of COVID (fever, shortness of breath, headache, new loss of taste and smell, sore throat, nausea, vomiting, diarrhea)
- Check the US State Department or the CDC for information on individual country requirements for vaccines, COVID testing, and quarantine. https://travel.state.gov/content/travel/en/us-visas/immigrate/vaccinations.html

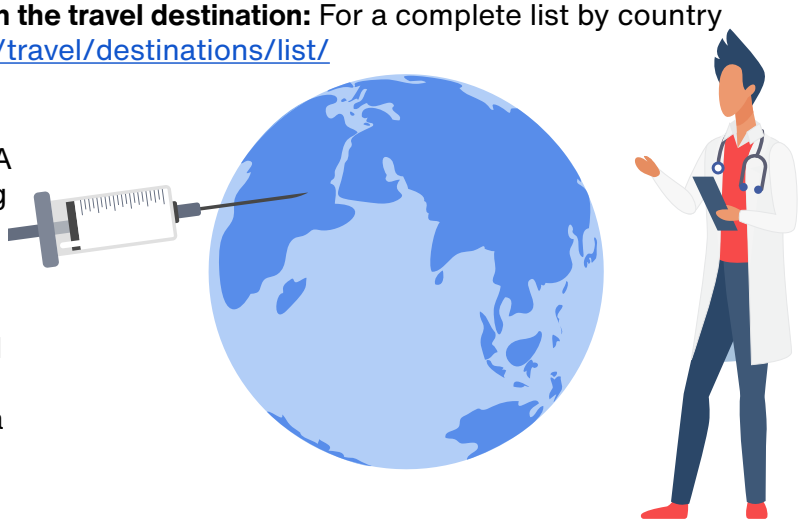
  https://www.cdc.gov/coronavirus/2019-ncov/travelers/map-and-travel-notices.htm

5. **Tetanus-containing Vaccines:** consider for all persons who do not have documentation of at least one dose within the last 10 years.



- Indicated for adults every 10 years following a final pediatric dose at 11-12 years of age. Adults should receive a single dose of Tdap or Td every 10 years with all adults receiving at least one dose of Tdap. Vaccine providers can administer Tdap to an adult who has never received it at any time, regardless of when they last received Td.

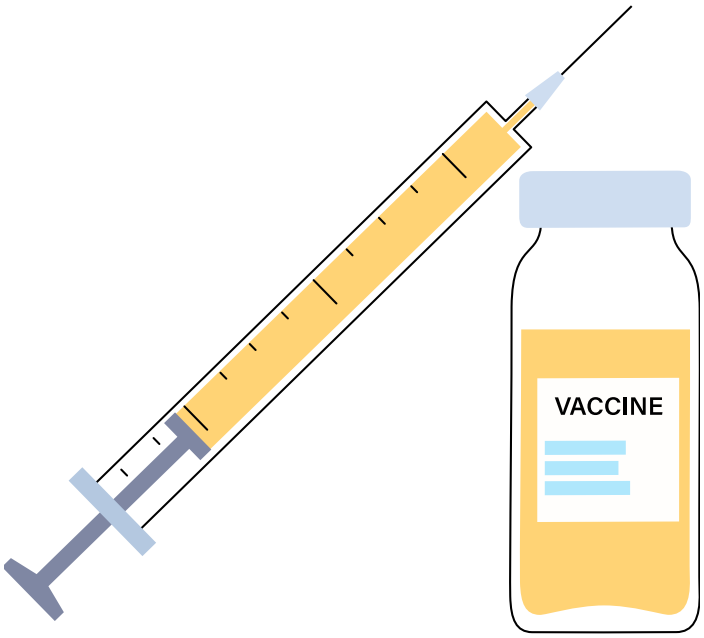
The following are travel-specific vaccines based on the travel destination: For a complete list by country go to the CDC website at: https://wwwnc.cdc.gov/travel/destinations/list/



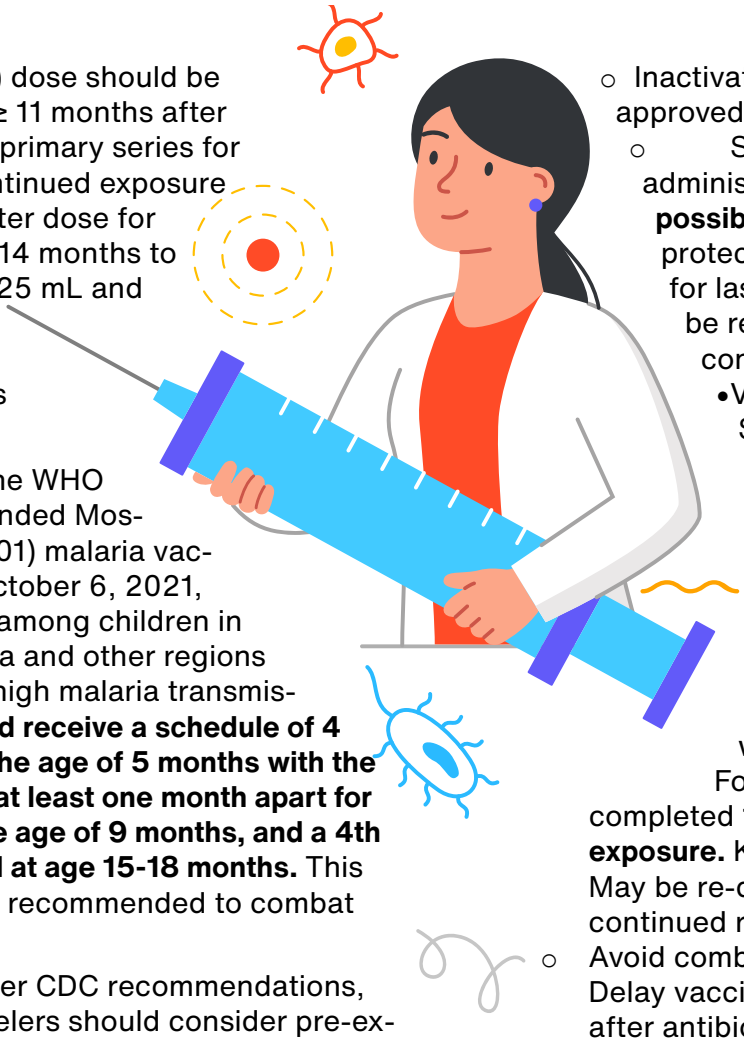
1. **Cholera Vaccine:** Vaxchora® (lyophilized CVD 103-HgR) is an oral live attenuated vaccine FDA approved for persons ages 2-64 years traveling to areas of active cholera transmission.
   - Active cholera transmission is defined as an area within a country with endemic or epidemic cholera caused by V. cholerae O1 & has had activity within the last year.
   - Approved for adults 2-64 years of age as a single dose: must be administered 10 days prior to potential exposure.
   - No data exist on safety and efficacy in pregnant or breastfeeding women & immunocompromised patients; must consider risks associated with travel to an active transmission area.
   - Should not be given to patients who have taken antibiotics (oral or parenteral) in the preceding 14 days.
   - If chloroquine is indicated for malaria prophylaxis, chloroquine must be started > 10 days after cholera vaccine administration.
   - Buffer of cholera vaccine may interfere with enteric-coated Ty21a typhoid vaccine. Taking the first Ty21a dose > 8 hours after cholera vaccine may decrease potential interference.
   - May shed virus in stool for ≥ 7 days; potentially may transmit to close contacts.
   - Requires mixing with the supplied buffer and must be consumed by the patient within 15 minutes after reconstitution. Follow medical waste disposal procedures.
   - Patients must avoid eating or drinking 60 minutes before and after ingestion of the cholera vaccine.
   - Vaccine efficacy has been established at 3 months after vaccination. Safety and efficacy beyond 3 months or the need for booster doses has not been established.

2. **Dengue Vaccine:** Dengvaxia® (Dengue Tetravalent Vaccine, Live) is FDA-approved in the U.S. for children aged 9-16 years with laboratory-confirmed previous dengue infection **AND** living in endemic areas (see https://www.cdc.gov/dengue/areaswithrisk/index.html)
   - Dosage and Administration: 0.5 mL by subcutaneous route at 0, 6, and 12 months (3-dose series)
   - Protects against all serotypes of the dengue virus (1, 2, 3, and 4)
   - Should **NOT** be used in individuals who do **NOT** live in endemic areas and have **NOT** been previously infected by any dengue virus or if previous infection history is unknown, as it increases the risk for severe dengue disease if subsequently infected with the virus
   - Contraindicated in immunosuppressed individuals
   - Requires reconstitution with 0.6 mL of 0.4% NaCl diluent (included with lyophilized vaccine antigen). Swirl gently without removing the needle. The resulting suspension should be colorless, with potentially trace amounts of white/translucent particles. If the vial contains more than trace particles, it should be discarded.
   - After reconstitution, it should be administered immediately or can be refrigerated (2°C to 8°C) for no more than 30 minutes.

3. **Ebola Vaccine:** Ervebo® (*Zaire ebolavirus* vaccine) is approved by the FDA in individuals age 18 and older as a single dose. Booster administration is assessed on an individual basis. Ervebo® is not commercially available in the United States; however, it can be made available for pre-exposure vaccination to eligible people by the Assistant Secretary for Preparedness.
    - Eligibility categories:
        - Ebola virus disease responders - individuals responding to an outbreak of *Zaire ebolavirus*,
        - Laboratorians and support staff working at Biosafety Level 4 facilities who work with replication competent *Zaire ebolavirus*, and
        - Healthcare personnel at federally designated Ebola Treatment Centers involved in the transport and care of patients known or suspected to be infected with *Zaire ebolavirus.*
4. **Japanese Encephalitis (JE) Vaccine:** Ixiaro® (Japanese Encephalitis Vaccine, Inactivated, Adsorbed) is considered for long-term and recurrent travelers who plan to spend ≥ 1 month in endemic areas during JE virus transmission season or expatriates traveling to rural or agricultural areas during high-risk periods of JE virus transmission.



- **Consider** for short-term travelers (< 1 month) to endemic areas if traveling during peak transmission season, travel is not limited to urban areas, and activities will increase risk of JE virus exposure.
- **May also consider** for those traveling to areas with ongoing JE outbreak, with unknown specific destinations, activities, or travel duration.
- **NOT** recommended for short-term travelers whose visits will be restricted to urban areas or times outside of a well-defined JE virus transmission season.
- CDC JE Vaccine Decision Tree: https://www.cdc.gov/japaneseencephalitis/vaccine/InfographicsOutline-508.pdf
- Risk Factors for JE Among Travelers: https://www.cdc.gov/japaneseencephalitis/vaccine/InfographicsRiskFactors-508.pdf
- The vaccination dose and primary schedule for the JE vaccine varies by age.
    - **2 months to < 3 years:** 2 doses (0.25 mL each) administered intramuscularly (IM) on days 0 and 28.
        - NOTE: to administer a 0.25 mL dose, expel and discard half of the volume from the 0.5 mL pre-filled syringe by pushing the plunger stopper up to the edge of the red line on the syringe barrel prior to injection
    - **3 to < 18 years:** 2 doses (0.5 mL each) administered IM on days 0 and 28.
    - **18 to 65 years:** 2 doses (0.5 mL each) administered IM on days 0 and 7–28;
        - NOTE: this is the only age group for which an accelerated schedule is approved.
    - **> 65 years:** 2 doses (0.5 mL each) administered IM on days 0 and 28.
    - For all age groups, the 2-dose series should be completed at least 1 week before potential exposure to JE virus.



- Booster (third) dose should be administered ≥ 11 months after completion of primary series for those with continued exposure risk. The booster dose for children aged 14 months to < 3 years is 0.25 mL and for adults and children aged ≥ 3 years is 0.5 mL.

5. **Malaria Vaccine:** the WHO formally recommended Mosquirix® (RTS,S/AS01) malaria vaccine, beginning October 6, 2021, for expanded use among children in sub-Saharan Africa and other regions with moderate to high malaria transmission. **Infants should receive a schedule of 4 doses starting at the age of 5 months with the 1st 3 doses given at least one month apart for each dose until the age of 9 months, and a 4th dose administered at age 15-18 months.** This is the first vaccine recommended to combat malaria.

6. **Rabies Vaccine:** Per CDC recommendations, the following travelers should consider pre-exposure vaccine: individuals who fall in Risk Categories 1–4.

   Pre-Exposure Prophylaxis:
   - **Current recommendations for immunocompetent people are two (2) 1mL doses on days 0 and 7.**
   - It is important to note that exposure will need to be managed, even if pre-exposure prophylaxis has been provided.
   - Imovax Rabies® (HDCV vaccine) or RabAvert® (PCECV)

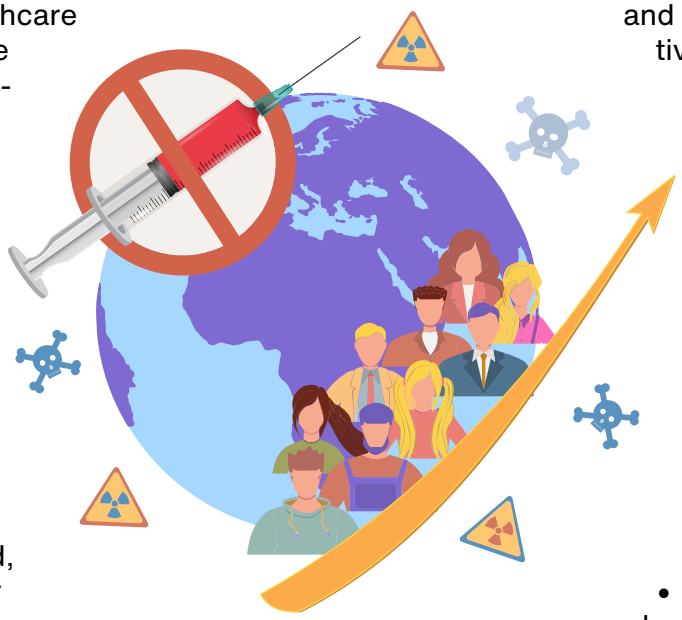
7. **Typhoid Vaccine:** for all patients traveling to increased risk areas of exposure to Salmonella Typhi. Formulation choice is based on age, patient preference, & departure time.
   - Typhim Vi® (ViCPS, Sanofi Pasteur)
   - Inactivated polysaccharide vaccine approved for patients ages ≥ 2 years:
     - Single IM dose should be administered **≥ 2 weeks prior to possible exposure** for optimal protection, but may be considered for last-minute travelers. May be re-dosed every 2 years if at continued risk.
   - Vivotif® (Ty21a, Emergent Bio Solutions)
     - Live-attenuated oral vaccine (Ty21a) approved for patients ages ≥ 6 years:
       - Consists of 4 oral capsules, taken as 1 capsule every other day one hour before a meal with cold or lukewarm drink. Four-dose series should be completed **1 week prior to possible exposure.** Keep capsules refrigerated. May be re-dosed every 5 years if at continued risk.
     - Avoid combination with antibiotics. Delay vaccine series until > 3 days after antibiotics course is complete or complete vaccine series > 7 days before first antibiotic dose.
     - Antimalarial agents mefloquine, chloroquine, atovaquone/proguanil, and pyrimethamine/sulfadoxine, when used at prophylaxis doses, may be administered with the live-attenuated oral vaccine. The manufacturer recommends other antimalarials agents be administered at least 3 days after the last vaccine dose.
     - Avoid pregnancy by using effective contraception for 4 weeks after vaccination in female patients with childbearing potential.
     - If the oral vaccine is not available due to ongoing production or supply issues, travelers aged 2 and older should receive the injectable vaccine.

8. **Yellow fever vaccine:** consider use in those who are traveling to or through yellow fever endemic areas or when proof of vaccination is required for entry. Consult CDC for destination specific recommendations at http://wwwnc.cdc.gov/travel/destinations/list.
   - Yellow fever vaccine should be avoided in children < 6 months, those allergic to gelatin, latex, or egg proteins, or in those who are severely immunocompromised. HIV infection with CD4 count 200 to 499/mm^3 is a precaution for yellow fever vaccine. (May offer a waiver instead of vaccination when benefit does not outweigh risk.)
     - Consider risk-benefit, especially in children 6-8 months and patients ≥ 60 years old who have never previously received the yellow fever vaccine.
     - Women who are pregnant should only be vaccinated if travel to a yellow fever endemic area is unavoidable & the benefit of vaccination outweighs the risks.
   - WHO/CDC now consider a single dose to be protective for life. Country-specific regulations may still require revaccination at every 10 years and require initial administration **at least 10 days before travel.**

Non-vaccine travel considerations include:

Tuberculosis (TB) testing: only for patients at increased risk of exposure during travel including healthcare workers, those who will have contact with prison or homeless populations, & expatriates to countries with high TB prevalence.

- Two-step tuberculin skin testing (TST) should be given prior to travel (2nd test 1-3 weeks after 1st) with repeat testing every 6-12 months during possible exposure period, and 8-12 weeks after return.
- Alternative test: interferon-gamma release assays (IGRA) (more specific in patients who have received BCG vaccines) may also be used if time before departure is too short for two-step TST.
- TST may also be considered for travelers visiting friends and relatives to document status prior to travel, which can aid in interpretation of future positive tests.



Malaria chemoprophylaxis: in combination with mosquito avoidance and 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 travelers to areas where malaria transmission occurs. Assess itinerary to determine risk for exposure & other specific factors in choice of chemoprophylaxis regimen.

- When deciding on chemoprophylaxis regimen, consider drug resistance in area of travel, length of travel, traveler's medical conditions, renal clearance, allergy history, concomitant medications, and potential side effects. For comprehensive dosing guidelines and side effects see: https://www.cdc.gov/malaria/travelers/drugs.html

- Resistance factors
  - Chloroquine & primaquine usefulness is limited to Central America; resistance exists in all other areas.
  - Avoid mefloquine in parts of South East Asia (e.g., Thailand) due to resistance.
  - Krintafel® (Tafenoquine) is effective prophylaxis in any malarious area.
  - Avoid Malarone® (atovaquone/proguanil), doxycycline, primaquine, and tafenoquine in patients who are pregnant.
- Health conditions to consider
  - Avoid mefloquine and tafenoquine in patients with personal or family history of psychiatric conditions.
  - In patients with depression & anxiety, avoid mefloquine.
  - Avoid primaquine and tafenoquine in patients who do not have documented normal G6PD levels due to risk of death due to hemolysis in G6PD-deficient patients.

Stand-by emergency self-treatment (SBET) of traveler's diarrhea (TD): for all travelers to developing countries.

- Prophylactic antibiotics should not be recommended for most travelers. They may be considered for short-term travelers at high risk (e.g., immunocompromised or with significant comorbidities).
- First-line treatment options include azithromycin (*preferred*), ciprofloxacin, levofloxacin, rifaximin, and loperamide.
  - Limit use of fluoroquinolones due to increasing resistance among strains of *Camphylobacter* and *Shigella* species globally, particularly in South and SE Asia.
  - Single-dose regimens, which may be more convenient for the traveler, are equivalent to multi-dose regimens; however, side effects may limit acceptability.
  - Antimotility agents (e.g., bismuth subsalicylate & loperamide) may be recommended as adjunct symptomatic therapy but not for those with bloody diarrhea or fever.
  - Loperamide may be used alone for mild or moderate TD.
- All travelers should receive prevention education (e.g., food/drink selection, washing hands, ≥ 60% alcohol-based hand sanitizer, etc.).

Altitude illness prophylaxis: for all travelers at moderate to high risk for altitude illness including those planning rapid ascents of >1,600 ft (sleeping altitude) per day above 9,000 ft with/without extra acclimatization days every 3,300 ft or those with a history of altitude illness.

- Diamox® (Acetazolamide) - prevention dosing: 125 mg (or 250 mg if > 100 kg) twice daily beginning 1 day prior to ascent, during ascent, and for 2 days at destination altitude.
- Dexamethasone, nifedipine, tadalafil, and/or sildenafil may be used if a patient is contraindicated to acetazolamide.
- During the first 48 hours, avoid alcohol, perform mild exercise only, and only continue caffeine if a regular caffeine user.
- Refer to High-Altitude Travel & Altitude Illness - Chapter 3 - 2020 Yellow Book | Travelers' Health | CDC for guidance on preexisting medical conditions.

Motion Sickness, Deep Vein Thrombosis/Pulmonary Embolism, Sun Exposure, and Insect/Tick Prevention should be discussed with every traveler as it pertains to their itinerary.

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