Travelers’ Health and Vaccination

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As occupational and environmental medicine (OEM) physicians are responsible for developing and implementing a travelers’ health program in the workplace, the American College of Occupational and Environmental Medicine (ACOEM) has developed this guidance to provide up-to-date information on what vaccines, and the timing thereof, are necessary for employees who travel.

Organizations should have a method to advise their employees concerning various travel-related issues such as prevention of jet lag, food- and water-borne diseases, local outbreaks of illness, motion sickness, and the need for medical care abroad. Vaccinations and information should be available to employees who may be exposed to a disease for which there is an effective vaccination (e.g., hepatitis A and B virus exposure in travel to certain areas). It is beneficial to have formal travel programs for domestic and international travelers/assignees as appropriate pre-trip and post-trip/expatriates’ evaluation.

As part of the travel medicine program, immunizations should be given in compliance with national guidelines such as the Advisory Committee on Immunization Practices (ACIP) for appropriate groups for required routine (influenza, pneumococcal disease) and recommended vaccines (e.g., hepatitis A and B, typhoid, yellow fever, tetanus, Japanese encephalitis, meningitis, etc.). OEM physicians administer vaccines based on their region and supply and may be responsible for administering and documenting these vaccines; others may refer employees to a travel medicine program/clinic to receive the appropriate immunizations prior to traveling. All physicians and health care professionals who report to them are encouraged to take steps to help ensure that their adult patients are fully immunized. For additional guidance, please refer to the Centers for Disease Control and Prevention’s (CDC) Standards for Adult Immunization Practice (SAIP) resource. Vaccination requirements/recommendations are dependent on the travel destination and the activity performed by the employee as well as the duration of travel. It is important that travelers contact their physician to know the best next steps. There are continually updated websites, such as the CDC – Travel Health website (https://wwwnc.cdc.gov/travel) and state public health departments.

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The following table outlines the recommended vaccine schedule/dosing for travel-related vaccines.

*Note: This table does not take into account travelers who are pregnant, immunosuppressed, elderly, or providing relief operations in armed conflict/disaster/outbreak/political or geopolitical challenges at their travel destination. A risk/benefit assessment of the prospective traveler needs to be performed prior to recommending any vaccine or other prophylaxis.*

<table>
<thead>
<tr>
<th>VACCINE</th>
<th>TRADE NAME (MANUFACTURER)</th>
<th>AGE</th>
<th>DOSE</th>
<th>ROUTE</th>
<th>SCHEDULE</th>
<th>BOOSTER</th>
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</thead>
<tbody>
<tr>
<td>Cholera CVD 103-HgR vaccine</td>
<td>Vaxchora (Emergent Travel Health)</td>
<td>2-64 years</td>
<td>100 mL (reconstituted)</td>
<td>Oral</td>
<td>1 dose¹</td>
<td>Determined by travel destination²</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≥19 years</td>
<td>1.0 mL (1,440 ELISA units)</td>
<td>IM</td>
<td>0 and 6–12 months</td>
<td>None</td>
</tr>
<tr>
<td>Hepatitis A vaccine, inactivated</td>
<td>Havrix (GlaxoSmithKline)</td>
<td>1–18 years</td>
<td>0.5 mL (720 ELISA units)</td>
<td>IM</td>
<td>0 and 6–12 months</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≥19 years</td>
<td>1.0 mL (1,440 ELISA units)</td>
<td>IM</td>
<td>0 and 6–12 months</td>
<td>None</td>
</tr>
<tr>
<td>Hepatitis A vaccine, inactivated</td>
<td>Vaqta (Merck &amp; Co., Inc.)</td>
<td>1–18 years</td>
<td>0.5 mL (25 U)</td>
<td>IM</td>
<td>0 and 6–18 months</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≥19 years</td>
<td>1.0 mL (50 U)</td>
<td>IM</td>
<td>0 and 6–18 months</td>
<td>None</td>
</tr>
<tr>
<td>Hepatitis B vaccine, recombinant with novel adjuvant (1018)</td>
<td>Heplisav- B (Dynavax Technologies Corp.)</td>
<td>&gt;18 years</td>
<td>0.5 mL (20 μg HBsAg and 3,000 μg of 1018)</td>
<td>IM</td>
<td>0, 1 month</td>
<td>None</td>
</tr>
<tr>
<td>Hepatitis B vaccine, recombinant²</td>
<td>Engerix-B (GlaxoSmithKline)</td>
<td>0–19 years</td>
<td>0.5 mL (10 μg HBsAg)</td>
<td>IM</td>
<td>0, 1, 6 months</td>
<td>None</td>
</tr>
<tr>
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<tr>
<td>Hepatitis B vaccine, recombinant&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Recombivax HB (Merck &amp; Co., Inc.)</td>
<td>0–19 years (primary)</td>
<td>0.5 mL (5 μg HBsAg)</td>
<td>IM</td>
<td>0, 1, 6 months</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11–15 years (adolescent accelerated)</td>
<td>1 mL (10 μg HBsAg)</td>
<td>IM</td>
<td>0, 4–6 months</td>
<td>None</td>
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<tr>
<td></td>
<td></td>
<td>≥20 years (primary)</td>
<td>1 mL (10 μg HBsAg)</td>
<td>IM</td>
<td>0, 1, 6 months</td>
<td>None</td>
</tr>
<tr>
<td>Combined hepatitis A and hepatitis B vaccine</td>
<td>Twinrix (GlaxoSmithKline)</td>
<td>≥18 years (primary)</td>
<td>1.0 mL (720 ELU HAV + 20μg HBsAg)</td>
<td>IM</td>
<td>0, 1, 6 months</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≥18 years (accelerated)</td>
<td>1.0 mL (720 ELU HAV + 20μg HBsAg)</td>
<td>IM</td>
<td>0, 7, and 21–30 days</td>
<td>12 months</td>
</tr>
<tr>
<td>Japanese encephalitis vaccine, inactivated</td>
<td>Ixaro (Valneva)</td>
<td>2 months – 2 years</td>
<td>0.25 mL</td>
<td>IM</td>
<td>0, 28 days</td>
<td>≥1 year after primary series&lt;sup&gt;4&lt;/sup&gt;</td>
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<tr>
<td></td>
<td></td>
<td>3–17 years</td>
<td>0.5 mL</td>
<td>IM</td>
<td>0, 28 days</td>
<td>≥1 year after primary series&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18–65 years</td>
<td>0.5 mL</td>
<td>IM</td>
<td>0, 7–28 days</td>
<td>≥1 year after primary series&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
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<tr>
<td>Meningococcal polysaccharide diphtheria toxoid conjugate vaccine (MenACWY-D)</td>
<td>Menactra (Sanofi Pasteur)</td>
<td>&gt;65 years</td>
<td>0.5 mL</td>
<td>IM</td>
<td>0, 28 days</td>
<td>≥1 year after primary series^4</td>
</tr>
<tr>
<td>Meningococcal polysaccharide diphtheria toxoid conjugate vaccine (MenACWY-D)</td>
<td>Menactra (Sanofi Pasteur)</td>
<td>9–23 months</td>
<td>0.5 mL</td>
<td>IM</td>
<td>0, 3 months</td>
<td>If at continued risk^7</td>
</tr>
<tr>
<td>Meningococcal polysaccharide diphtheria toxoid conjugate vaccine (MenACWY-D)</td>
<td>Menactra (Sanofi Pasteur)</td>
<td>≥2 years</td>
<td>0.5 mL</td>
<td>IM</td>
<td>1 dose^6</td>
<td>If at continued risk^7</td>
</tr>
<tr>
<td>Meningococcal polysaccharide diphtheria toxoid conjugate vaccine (MenACWY-D)</td>
<td>Menveo (GSK)</td>
<td>2–6 months</td>
<td>0.5 mL</td>
<td>IM</td>
<td>0, 2, 4, 10 months</td>
<td>If at continued risk^7</td>
</tr>
<tr>
<td>Meningococcal polysaccharide diphtheria toxoid conjugate vaccine (MenACWY-D)</td>
<td>Menveo (GSK)</td>
<td>7–23 months</td>
<td>0.5 mL</td>
<td>IM</td>
<td>0,3 months (2nd dose administered in 2nd year of life)</td>
<td></td>
</tr>
<tr>
<td>Meningococcal polysaccharide diphtheria toxoid conjugate vaccine (MenACWY-D)</td>
<td>Menveo (GSK)</td>
<td>≥2 years</td>
<td>0.5 mL</td>
<td>IM</td>
<td>1 dose^6</td>
<td>If at continued risk^7</td>
</tr>
<tr>
<td>Mumps, Measles and Rubella (MMR)</td>
<td>MMR</td>
<td>&gt;1 years</td>
<td>0.5 mL</td>
<td>SC</td>
<td>1 or 2 doses (depending on risk factors) For adults: 0, and 4 weeks (if second dose indicated).</td>
<td>None</td>
</tr>
<tr>
<td>Polio vaccine, inactivated</td>
<td>Ipol (Sanofi Pasteur)</td>
<td>≥18 years</td>
<td>0.5 mL</td>
<td>SC or IM</td>
<td>1 dose if patient has completed a pediatric series If unvaccinated, then two doses are separated</td>
<td>Repeat boosters may be needed for long-term travelers to polio-affected countries; see Chapter 4, Polio of</td>
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<tr>
<td>Rabies vaccine (human diploid cell)</td>
<td>Imovax (Sanofi Pasteur)</td>
<td>Any</td>
<td>1 mL</td>
<td>IM</td>
<td>Pre-exposure series: 0, 7 days</td>
<td>None; see Chapter 4 of the Yellow Book (CDC), Rabies for postexposure immunization</td>
</tr>
<tr>
<td>Rabies vaccine (purified chick embryo cell)</td>
<td>RabAvert (Novartis)</td>
<td>Any</td>
<td>1 mL</td>
<td>IM</td>
<td>Pre-exposure series: 0, 7 days</td>
<td>None; see Chapter 4 of the Yellow Book (CDC), Rabies for postexposure immunization</td>
</tr>
<tr>
<td>Tick-borne encephalitis (TBE)</td>
<td>TicoVac (Pfizer)</td>
<td>1-15 years</td>
<td>0.25 mL</td>
<td>IM</td>
<td>0, 1-3, 5-12 months</td>
<td>A fourth dose may be given at least 3 years after completion of the primary vaccination schedule if ongoing exposure or re-exposure is expected.</td>
</tr>
<tr>
<td>Typhoid vaccine (oral, live, attenuated)</td>
<td>Vivotif (Emergent Travel Health)</td>
<td>≥6 years</td>
<td>1 capsule</td>
<td>Oral</td>
<td>0, 2, 4, 6 days</td>
<td>Repeat primary series after 5 years</td>
</tr>
<tr>
<td>VACCINE</td>
<td>TRADE NAME (MANUFACTURER)</td>
<td>AGE</td>
<td>DOSE</td>
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<tr>
<td>Typhoid vaccine (Vi capsular polysaccharide)</td>
<td>Typhim Vi (Sanofi Pasteur)</td>
<td>≥2 years</td>
<td>0.5 mL</td>
<td>IM</td>
<td>1 dose</td>
<td>2 years</td>
</tr>
<tr>
<td>Yellow fever</td>
<td>YF-Vax (Sanofi Pasteur)</td>
<td>≥9 months</td>
<td>0.5 mL</td>
<td>SC</td>
<td>1 dose</td>
<td>Not recommended for most. Should be repeated when traveling to areas with ongoing outbreaks of Yellow Fever and repeated for post-bone marrow transplant recipients who previously had a Yellow Fever vaccination.</td>
</tr>
</tbody>
</table>

Abbreviations: ACIP, Advisory Committee on Immunization Practices; ELU, ELISA units of inactivated HAV; HAV, hepatitis A virus; HBsAg, hepatitis B surface antigen; IM, intramuscular; U, units; SC, subcutaneous.

1 Must be administered in a health care setting.
2 In a clinical trial, vaccine efficacy was 90% at 10 days postvaccination and declined to 80% at 3 months postvaccination in prevention of severe diarrhea after oral cholera challenge. Long-term immunogenicity is unknown. Clinicians advising travelers who are at continued or repeated risk over an extended period may consider revaccination, although the appropriate interval and efficacy are unknown.
3 Consult the prescribing information for differences in dosing for hemodialysis and other immunocompromised patients.
4 If potential for Japanese encephalitis virus exposure continues.
5 If an infant is receiving the vaccine before travel, 2 doses may be administered as early as 8 weeks apart.
6 For people with HIV, anatomic or functional asplenia, and people with persistent complement component deficiencies (C3, C5-9, properdin, factor D, and factor H or people taking eculizumab [Soliris]) should receive a 2-dose primary series 8–12 weeks apart.
7 Revaccination with meningococcal conjugate vaccine (MenACWY-D or MenACWY-CRM) is recommended after 3 years for children who received their last dose at <7 years of age.

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Revaccination with meningococcal conjugate vaccine is recommended after 5 years for people who received their last dose at ≥7 years of age, and every 5 years thereafter for people who are at continued risk.

8 Must be kept refrigerated at 35.6°F–46.4°F (2°C–8°C); administer with cool liquid no warmer than 98.6°F (37°C).

9 Ages 6–8 months and ≥60 years are precautions and age <6 months is a contraindication to the use of yellow fever vaccine. The yellow fever vaccine is lifetime lasting.

10 YF Vax is available in single-dose and multiple-dose (5-dose) vials.

11 For full details regarding revaccination, see "Vaccine Administration" in Chapter 4, Yellow Fever in the Yellow Book (CDC).


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