APhA

Travel Health Reference Guide

EXTENSION TO
the Travel Health Pocket Guide

2021 Update

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Acknowledgments

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Quick Reference Chart - Vaccine

Vaccine Chart	Typhoid Fever	Typhoid Fever	Yellow Fever
Acronym	Ty21a	ViCPS	17D
Brand name	Vivotif®	Typhim Vi®	YF-Vax®
Indications	Prevention of typhoid fever caused by *Salmonella typhi*	Prevention of typhoid fever caused by *Salmonella typhi*	Prevention of yellow fever caused by the RNA virus of the genus *Flavivirus*
Number and schedule of doses	4 doses: 1 capsule every 48 hours (days 1, 3, 5, and 7) Booster every 5 years if still at risk	0.5 mL IM vaccine Booster every 2 years if still at risk	0.5 mL SUBQ injection Booster at 10 years only recommended in certain situations per ACIP
Route of admin	Oral	Intramuscular	Subcutaneous
Other pertinent information	≥ 6 years of age; live vaccine	≥ 2 years of age; inactivated vaccine	Due to total depletion of YF-Vax® in the United States, the FDA approved Stamaril®, manufactured by Sanofi Pasteur in France under an investigational new drug (IND) program. YF-Vax® supply is projected to become available in December of 2020.

Quick Reference Chart (continued) - Vaccine

Vaccine Chart	Rabies	Japanese Encephalitis	Cholera
Acronym	HDCV or PCECV	SA_{14}-14-2	Lyophilized CVD 103-HgR
Brand name	Imovax® or RabAvert®	Ixiaro®	Vaxchora®
Indications	Prevention of rabies disease caused by rabies virus, used for pre-exposure and post-exposure prophylaxis	Prevention of disease caused by Japanese encephalitis virus (JEV)	Indicated for prevention of cholera caused by serogroup O1 in adults 18-64 years of age who are traveling to an area of active cholera transmission
Number and schedule of doses	Pre-exposure: 3 doses of 1 mL IM at days 0, 7, and 21 or 28 Post-exposure: Rabies vaccine naive: 4 doses at days 0 (after exposure), 3, 7, and 14 + 1 dose of RIG at day 0 up to day 7 Previously vaccinated: 2 doses at days 0 (after exposure) and 3 Booster depends on risk category	2-35 months: 0.25 mL IM x 2 doses 28 days apart 3 to <18 years: 0.5 mL IM x 2 doses 28 days apart 18-65 years: 0.5 mL IM x 2 doses 7 to 28 days apart >65 years: 0.5 mL IM x 2 doses 28 days apart	Single, oral liquid dose (~3 ounces) at least 10 days prior to traveling to a cholera affected area
Route of admin	Intramuscular	Intramuscular	Oral
Other pertinent information	All ages; inactivated vaccine	Complete the primary immunization series at least 1 week prior to potential exposure to JEV. A booster dose (third dose) may be given at least 11 months after completion of the primary series if ongoing exposure or re-exposure to JEV is expected; inactivated vaccine	Area of active transmission can be a province, state, or administrative subdivision of a country; cholera infections can be endemic or an outbreak (epidemic) within the past year. Not regularly recommended for most travelers. Not required for entry into any country/ territory

Quick Reference Chart (continued) - Vaccine

Vaccine Chart	Ebola	Dengue
Acronym	rVSVΔG-ZEBOV (V920)	CYD-TDV
Brand name	Ervebo®	Dengvaxia®
Indications	Prevention of Ebola caused specifically by *Zaire ebolavirus*	Protects against all serotypes of dengue virus (1, 2, 3, and 4)
Number and schedule of doses	1 dose: 1 mL IM vaccine	3 doses; 0.5 mL SUBQ at 0, 6, and 12 months
Route of admin	Intramuscular	Subcutaneous
Other pertinent information	≥ 18 years of age and at risk for exposure; live vaccine	9-16 years of age who live in areas where dengue is common permitting they have a laboratory-confirmed prior dengue virus infection; inactivated vaccine; live tetravalent vaccine *No ACIP recommendation as of 01/2021

TYPHOID FEVER

For the prevention of: Typhoid fever caused by *Salmonella typhi*

Type of vaccine: Oral live attenuated vaccine; Vi capsular Polysaccharide inactivated injectable

Brand names (manufacturer):

- **Oral**: Vivotif® (PaxVax, Inc)
- **Injectable**: Typhim Vi® (Sanofi Pasteur)

Dose and route of administration

Product	Indicated age	Dose and route of administration	Adverse effects
Vivotif® (Ty21a)	≥ 6 years	1 capsule orally every 48 hours (Days 1,3,5,7)	Abdominal pain, nausea, headache, fever, diarrhea, vomiting, skin rash
Typhim Vi® (ViCPS)	≥ 2 years	0.5 mL IM	**Injection site**: Pain and tenderness at injection site **Systemic**: malaise, headache, fever, joint pain

Storage:

- Oral: Store in refrigerator between 2^0C - 8^0C or 35.6^0F - 46.4^0F; do not freeze
- Injectable: Store in refrigerator between 2^0C-8^0C or 35.6^0F- 46.4^0F; do not freeze

Contraindications:

- Oral: Should not be administered to immunocompromised patients (including HIV patients), children less than 6 years of age, or pregnant women
- No safety data in pregnant women, theoretically the safer option is the ViCPS injectable product if the benefits of vaccination outweigh the risks

Administration/Preparation Instructions:

- Oral: Capsules must be swallowed whole with cold or luke-warm liquid no warmer than 37^0C (98.6^0F)
  - Must take on an empty stomach; 1 hour before a meal or ≥ 2 hours after a meal
  - Once a capsule is removed from the blister pack, the remaining capsules must be returned to the refrigerator
  - Booster: Every 5 years if still at risk
  - Should not be taken during an acute gastrointestinal illness or an acute febrile illness
  - No studies have been done on the effects of missed or late doses; Optimal immunity is not achieved if all 4 doses are not completed as directed

- Injectable: Inject 0.5 mL (25mcg) intramuscularly
  - Adults: deltoid
  - Children: either deltoid or anterolateral thigh
  - Do not inject into the gluteal area or areas where there may be a nerve trunk. Do not inject intravenously
  - Booster: every 2 years if still at risk
  - Not recommended for children less than 2 years of age
  - Should not be administered if the patient has an acute febrile illness

Recommended Days Before Travel:

- Oral: All 4 capsules must be taken ≥ 1 week prior to travel
- Injectable: Must be administered ≥ 2 weeks prior to travel

Spacing Requirements with Other Vaccines:

- Oral:
  - No data that administration of yellow fever vaccine decreases immunogenicity of Ty21a; thus, no need to wait 28 days if not administered simultaneously
  - No data on co-administration of Ty21a and oral cholera vaccine; it is recommended to take the first dose of Ty21a ≥ 8 hours after oral cholera vaccine to decrease any potential interference

Accelerated Dosing Regimen:

- Not applicable

Additional Information:

- Both vaccines protect 50-80% of recipients, neither vaccine is 100% effective; Patients must still adhere to food and water precautions
- Neither vaccine is indicated against *Salmonella paratyphi* or other bacteria that cause enteric disease
- Drug interactions with oral Ty21a:
  - Delay administration of Ty21a by ≥ 72 hours after administration of antibiotics and antibiotics should not be given to a patient within 72 hours of the last Ty21a dose
  - Should separate Ty21a and proguanil by ≥ 10 days from the final dose of Ty21a
  - Clinical studies demonstrate mefloquine or chloroquine can be administered together with Ty21a
- No known drug or food interactions with injectable ViCPS

References:

- Vivotif [Package Insert]. PaxVax, Inc. Redwood City, CA; Updated April 2017
- Typhim Vi [Package Insert]. Sanofi-Pasteur. Swiftwater, PA; 2014; Updated November 2007
- Centers for Disease Control and Prevention. CDC Yellow Book 2020: Health Information for International Travel. New York: Oxford University Press; 2019. Pages 364-368.

YELLOW FEVER

For the prevention of: Yellow Fever caused by a single-stranded RNA virus that belongs to the genus *Flavivirus*

Type of vaccine: Live attenuated vaccine

Brand names (manufacturer): YF-Vax® (Sanofi Pasteur), STAMARIL® (Sanofi Pasteur France)

Dose and route of administration

Product	Indicated age	Dose and route of administration	Adverse effects
YF-Vax® (17D)	≥ 9 months	0.5 mL SUBQ injection	**Common** (10-30%): Myalgia, headache, fever **Rare**: Hypersensitivity, Yellow-Fever Vaccine-Associated Neurologic Disease, Yellow Fever Vaccine-Associated Viscerotropic Disease
Stamaril® (Investigational New Drug in the U.S.)	≥6 months	0.5 mL SUBQ or IM injection	**Common** (>10%): Headache, asthenia, pain at injection site, myalgia, fever, vomiting (in children) **Rare**: Hypersensitivity, high fever, stiff neck, inflammation of brain and nerve tissues, Guillain-Barre Syndrome, focal neurological deficit

Storage:

- YF-Vax®: Store refrigerated between 2°C and 8°C; Do not freeze
- Stamaril®: Store refrigerated between 2°C and 8°C; Do not freeze; Keep vial of powder and syringe of solvent in the outer carton to protect from light

Contraindications:

- Children < 9 months of age due to an increased risk of encephalitis
- Nursing mothers who are breastfeeding children < 9 months of age
- Vaccine preparation involves culturing virus in living chicken embryos - contraindicated in severe egg allergy
- Hypersensitivity to gelatin or sorbitol
- Patients with severe immunosuppression

Administration/Preparation Instructions:

- YF-Vax® requires reconstitution with supplied diluent (0.6mL vial of sodium chloride injection USP); vaccine contains pinkish powder in a vial
  - Withdraw supplied diluent and slowly inject into the vial containing the vaccine
  - Allow to sit for 1-2 minutes and carefully swirl mixture until a uniform suspension is achieved; avoid vigorous shaking
  - After reconstitution, the suspension may be a slight pink-brown color
  - Withdraw 0.5 mL dose from the vial and administer within 60 minutes

- Stamaril® requires reconstitution; contains powder and solvent for suspension for injection
  - Add clear sodium chloride solvent provided in a pre-filled syringe to the vial containing beige to orange-beige powder
  - Shake vial until complete dissolution occurs
    - After reconstitution, the suspension may look beige to pink-beige, more or less opalescent
  - Withdraw 0.5mL of suspension into the same syringe for injection; Use immediately after reconstitution
  - Before administration, the reconstituted vaccine should be vigorously shaken

Recommended Days Before Travel:

- *At least 10 days prior to entry of countries requiring documentation*
- Documentation requirements
  - Some countries may require an International Certificate of Vaccination or Prophylaxis (ICVP) for yellow fever ("yellow card") as documentation providing proof of vaccination
  - The YF vaccine must be administered at an authorized center with an official stamp to validate the ICVP and bear an original signature of a licensed physician or health care worker
  - The International Health Regulations indicate that the vaccination certificate is valid 10 days after vaccine administration; Travelers without proof of vaccination or medical waiver in countries requiring documentation may be quarantined for up to 6 days, refused entry, or vaccinated on site

Spacing Requirements with Other Vaccines:

- Typical spacing requirements for live vaccines (wait 28 days unless administered at the same time)

Accelerated Dosing Regimen:

- Not applicable

Additional Information:

- Dosing Recommendations
  - For most healthy individuals, a single dose of YF vaccine provides life-long protection
  - ACIP identifies certain situations in which yellow fever booster doses are recommended:
    - Women who were pregnant when receiving initial vaccination should receive 1 additional dose before they are next at risk for yellow fever
    - Those who received a hematopoietic stem cell transplant after receiving initial vaccination should receive 1 additional dose before they are next at risk for yellow fever, as long as they are immunocompetent
    - Those infected with HIV when they received their last dose should receive a dose every 10 years if they continue to be at risk for yellow fever
- Regions of High Transmission
  - Yellow fever occurs mainly in sub-Saharan Africa and tropical South America
  - Other factors that may affect risk of transmission include: season of travel, duration of exposure, and activities while traveling
- Rare Severe Adverse Reactions
  - Yellow Fever Vaccine-Associated Neurologic Disease (YEL-AND): includes cases of meningoencephalitis, Guillain-Barre syndrome, acute disseminated encephalomyelitis, and cranial nerve palsies; Occurs more commonly in first-time vaccine recipients and those $\geq$ 60 years of age (incidence: 0.8 cases per 100,000 doses)
  - Yellow Fever Vaccine-Associated Viscerotropic Disease (YEL-AVD): similar to presentation of yellow fever disease, which may lead to multiorgan dysfunction and death. Occurs after the first dose of YF vaccine, and is more common in those > 60 years of age (incidence: 0.3 cases per 100,000 doses)

- YF-Vax® Shortage
  - As of 2017, total depletion of YF-Vax® was announced by the FDA; As a result, Stamaril®, manufactured by Sanofi Pasteur France, was imported and distributed to select locations in the United States under an expanded-access investigational new drug
  - CDC states that there are no significant differences in reactogenicity or immunogenicity between these two yellow fever vaccine products
  - Stamaril® clinic locations may be found at the following search database: https://wwwnc.cdc.gov/travel/page/search-for-stamaril-clinics

References:

- YF-VAX® vaccine [package insert]. Sanofi Pasteur Inc. Swiftwater, PA. Feb 2019.
- Stamaril® vaccine [patient leaflet]. Sanofi Pasteur France. Lyon, France. Oct 2017.
- Gershman MD, Staples JE. "Yellow Fever." CDC Yellow Book 2020: Health Information for International Travel. Chapter 4: Travel-related infectious diseases. New York: Oxford University Press; 2017. Updated August 2, 2019.
- Centers for Disease Control and Prevention. Clinical update announcement: temporary total depletion of US licensed yellow fever vaccine addressed by availability of stamaril vaccine at selected clinics. Updated June 25, 2020. Accessed by: https://wwwnc.cdc.gov/travel/news-announcements/yellow-fever-vaccine-access.

RABIES

For the prevention of: Rabies (pre-exposure and post-exposure)
Type of vaccine: Imovax® human diploid cell vaccine [HDCV], RabAvert® purified chick embryo cell vaccine [PCECV]
Brand names (manufacturer): Imovax® (Sanofi Pasteur), RabAvert® (GlaskoSmithKline)

Dose and route of administration:

Product	Indicated age	Dose and route of administration	Adverse effects
Imovax®	All age groups	**Pre-exposure:** 3-dose schedule: 1 mL IM at 0, 7, and 21 or 28 days Booster of one dose of 1 mL if antibody titer is below the acceptable level during serologic testing	**Injection site:** Pain, redness, soreness, swelling, or itching **Systemic:** Headache, nausea, abdominal pain, muscle aches, or dizziness; after booster doses, hives, joint pain, N/V, fever
RabAvert®	All age groups	**Pre-exposure:** 3-dose schedule: 1 mL IM at 0, 7, and 21 or 28 days Booster of one dose of 1 mL if antibody titer is below the acceptable level during serologic testing	**Injection site:** Pain, redness, swelling, or hardening of soft tissue **Systemic:** Malaise, headache, dizziness, muscle aches, joint pain, or nausea

Storage:

- Store in the refrigerator between 2°C and 8°C (35°F to 46°F); Do not freeze

Contraindications:

- Anaphylaxis or severe hypersensitivity to rabies vaccine or components of rabies vaccine

Administration/Preparation Instructions:

- Vaccine must be reconstituted and used immediately after reconstitution; inspect for particulate matter and discoloration prior to administration
  - Imovax® contains freeze-dried vaccine, a syringe containing 1.0 mL of diluent with plunger rod (inserted into the syringe or provided separately), and sterile reconstitution needle
  - Freeze-dried vaccine is creamy white to orange; after reconstitution, it is pink to red

- RabAvert® contains freeze-dried vaccine, a syringe containing 1.0 mL of sterile diluent, a sterile needle for reconstitution, and a sterile needle suitable for IM injection (the longer needle is the reconstitution needle)
  - Freeze-dried vaccine is white; after reconstitution, it is colorless to slightly pink
- Two rabies vaccines for use in the United States are considered interchangeable
- Indicated for people at high risk of exposure to rabies including:
  - Veterinarians, animal handlers, veterinary students
  - Rabies laboratory workers or people who work with rabies vaccine and rabies immune globulin
  - Spelunkers or people whose activities bring them in frequent contact with rabies virus or with possibly rabid animals
  - International travelers who are likely to come in contact with animals in parts of the world where rabies is common
- Administration sites:
  - Adults/older children: deltoid muscle
  - Infants/small children: anterolateral aspect of thigh may be preferable
  - DO NOT inject in gluteal area
- Pre-exposure rabies vaccination: 3 doses
  - Booster of one dose of 1 mL if antibody titer is below acceptable level
  - Serologic testing recommended every 6 months (for continuous risk category) or every 2 years (for frequent risk category)
- Post-exposure rabies vaccination:
  - Never been vaccinated against rabies (with no concurrent immunosuppression): 4 doses and rabies immune globulin (RIG)
    - Immediately after exposure (day 0) and at 3, 7, and 14 days later
    - 1 dose of RIG on day 0 or up to day 7 of post-exposure prophylaxis; not indicated beyond day 7 because of antibody response from vaccine
    - If patient is immunosuppressed, 5 doses and RIG
  - Previously vaccinated against rabies: 2 doses and no rabies immune globulin (RIG)
    - Immediately after exposure (day 0) and one dose 3 days later
  - Recommendation for post-exposure prophylaxis based on animal type and evaluation/disposition of the animal
  - May discontinue vaccine if appropriate laboratory diagnostic test is negative

Recommended Days Before Travel:

- Complete pre-exposure series at least 7-10 days prior to travel

Spacing Requirements with Other Vaccines:

- Consider booster dose of tetanus vaccine

Accelerated Dosing Regimen:

- Not applicable

Additional Information:

- Drug interactions:
  - Corticosteroids, other immunosuppressive agents or treatments, immunosuppressive illness
    - Can interfere with development of active immunity and predispose patient to developing rabies
    - Postpone pre-exposure vaccinations and consider avoiding activities for which pre-exposure prophylaxis is indicated
    - For post-exposure prophylaxis, avoid administering immunosuppressive agents if possible and test serum for rabies antibody to ensure adequate response

References:

- CDC. Human rabies prevention-United States, 2008: recommendations of the Advisory Committee on Immunization Practices. MMWR. 2008;57(RR-3):1-28.
- CDC. Use of a reduced (4-dose) vaccine schedule for postexposure prophylaxis to prevent human rabies: recommendations of the Advisory Committee on Immunization Practices. MMWR. 2010;59(RR-2):1-10.
- Imovax® rabies vaccine [package insert]. Swiftwater, PA: Sanofi Pasteur, Inc; 2019.
- RabAvert® rabies vaccine [package insert]. Research Triangle Park, NC: GlaxoSmithKline; 2018.

JAPANESE ENCEPHALITIS

For the prevention of: Japanese encephalitis virus (JEV)
Type of vaccine: Inactivated Vero cell culture-derived
Brand names (manufacturer): Ixiaro® (Valneva Austria GmbH)

Dose and route of administration:

Product	Indicated age	Dose and route of administration	Adverse effects
Ixiaro®	2-35 months	Two 0.25 mL IM doses 28 days apart	**Systemic**: fever, irritability, diarrhea **Injection site**: pain, redness, tenderness
Ixiaro®	3 to <18 years	Two 0.5 mL IM doses 28 days apart	**Systemic**: fever **Injection site**: pain, tenderness
Ixiaro®	18-65 years	Two 0.5 mL IM doses 7 to 28 days apart	**Systemic**: headache, myalgia **Injection site**: pain, tenderness
Ixiaro®	>65 years	Two 0.5 mL IM doses 28 days apart	**Systemic**: headache, myalgia **Injection site**: pain, tenderness

Storage:

- Store in a refrigerator at 2° to 8° C (35° to 46° F); Do not freeze
- Do not use the vaccine after the expiration date shown on the label
- Store in the original package to protect from light
- During storage, a clear liquid with a white precipitate can be observed

Contraindications:

- Anaphylaxis or severe allergic reaction after a previous dose of Ixiaro® or any other Japanese Encephalitis Virus (JEV) vaccine
- Hypersensitivity to protamine sulfate

Administration/Preparation Instructions:

- For intramuscular administration (IM) only. The preferred IM injection sites are:
- Anterolateral aspect of the thigh in infants 2 months to <3 years of age
- Deltoid muscle in individuals 3 years of age and older
- To administer a 0.25 mL dose for patients <3 years of age:

- Shake the syringe well to obtain a white, opaque, homogeneous suspension
- Remove the syringe tip cap by gently twisting it. Attach a sterile safety needle to the pre-filled syringe
- 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
- Replace the needle with a new sterile needle prior to injection
- To administer a 0.5 mL dose for patients 3 years and older:
  - Shake the syringe well to obtain a white, opaque, homogeneous suspension.
  - Remove the syringe tip cap by gently twisting it.
  - Attach a new sterile needle prior to injection.

Recommended Days Before Travel:

- Series must be completed at least 1 week prior to potential JEV exposure

Spacing Requirements with Other Vaccines:

- No special considerations

Accelerated Dosing Regimen:

- The accelerated dosing schedule allows adult travelers (18-65 years old) to receive 2 doses of Ixiaro® 7 days apart (as opposed to the normal 28-day schedule)

Additional Information:

- Vaccination is recommended for persons traveling long-term (> 1 month) or repeatedly to JE-endemic countries or those moving to a JE-endemic country; Vaccination may also be considered for short-term travel based on the country visited, season, activities planned, and accommodations
- Reducing exposure to mosquito bites through use of adequate clothing, repellents, and mosquito nets is still required
- Vaccine contains protamine sulfate, a compound known to cause hypersensitivity reactions in some individuals
- There are no adequate, well-controlled studies in pregnancy; Human data is insufficient to establish the presence or absence of drug-associated risk during pregnancy
- Immunosuppressive therapies may decrease the immune response
- JE is a mosquito-borne flavivirus that is the most common vaccine-preventable cause of encephalitis in Asia and the Western Pacific
- If ongoing exposure or re-exposure to JEV is expected, a booster dose (3rd dose) may be given if it has been at least 11 months since completion of the primary immunization series
- There is no treatment for JE; only supportive care

References:

- IXIARO [Package Insert]. Valneva Austria GmbH. Gaithersburg, MD; Updated September 2018.
- Hills SL, Walter EB, Atmar RL, Fischer M. Japanese Encephalitis Vaccine: Recommendations of the Advisory Committee on Immunization Practices. MMWR Recomm Rep 2019;68(No. RR-2):1–33.

CHOLERA

For the prevention of: Cholera (caused by *Vibrio cholerae* serogroup O1) in adults 2-64 years of age traveling to cholera-affected areas

Type of vaccine: Live, oral lyophilized CVD 103-HgR

Brand names (manufacturer): Vaxchora® (PaxVax Bermuda Ltd.)

Dose and route of administration

Product	Indicated age	Dose and route of administration	Adverse effects
Vaxchora®	2-64 years	100 mL (50 mL for children less than 6 years of age), single, reconstituted, oral dose; given at least 10 days prior to travel	**Systemic**: tiredness, headache, abdominal pain, nausea/vomiting, lack of appetite, diarrhea

Storage:

- Refrigerated formulation: store buffer and active component packets refrigerated at 2°C to 8°C (36°F to 46°F)
- Protect from light and moisture
- Packets should not be removed from the refrigerator for more than 15 minutes prior to reconstitution
- Packets should not be exposed to temperatures higher than 27°C (80°F) when removed from the refrigerator

Contraindications:

- Do not use in patients with history of severe allergic reaction to any ingredient or a previous dose

Administration/Preparation Instructions:

- Dose should be prepared and administered in a setting equipped to dispose of medical waste
- Complete reconstitution (in the correct order) must occur within 15 minutes of removal from storage (Video link available: https://emergenttravelhealth.com/vaxchora)
  - Pour 100 mL of purified or spring bottled water (either cold or room temperature) into a clean, disposable cup
  - Empty contents of buffer packet into cup and stir until completely dissolved (will see effervescence)
    - For children less than 6 years of age, discard half of the buffer solution
  - Add contents of the active component packet into the cup containing the dissolved buffer solution and stir for at least 30 seconds until the active component forms a cloudy suspension (may see some white particulates)
- Patients should avoid eating or drinking for 60 minutes before or after oral ingestion
- Vaccine must be consumed (full contents of the cup) within 15 minutes of reconstitution
- Do not administer if the patient has received oral or parenteral antibiotics within the previous 14 days
- Response may be diminished if administered concomitantly with chloroquine; administer the vaccine at least 10 days before initiating chloroquine

Recommended Days Before Travel:

- Should be given at least 10 days before travel

Spacing Requirements with Other Vaccines:

- Typical spacing requirements for live vaccines (wait 28 days unless administered at the same time)

Accelerated Dosing Regimen:

- Not applicable

Additional Information:

- Reported to reduce the chance of severe diarrhea at 10 days after vaccination by 90%
- Not known how long protection lasts beyond 3 – 6 months after getting the vaccine
- Effectiveness not established for those living in cholera-affected areas or those who have pre-existing immunity due to previous exposure or vaccine
- Vaxchora has not been shown to protect against serogroup O139 or other non-O1 serogroups
- Production and sale of the vaccine will temporarily stop in December 2020
- Safety and effectiveness in pregnant or breastfeeding women is not yet known

References:

- VAXCHORA [Package Insert]. Redwood City, CA: PaxVax Bermuda Ltd.; 2020.
- Food and Drug Administration. FDA News Release: FDA Approves vaccine to prevent cholera for travelers. Available from https://www.fda.gov/news-events/press-announcements/fda-approves-vaccine-prevent-cholera-travelers. Accessed January 16, 2020.
- Centers for Disease Control and Prevention. Vaccines: Vaxhora (lyophilized CVD 103-HgR). Available from https://www.cdc.gov/cholera/vaccines.html. Last updated November 18, 2020. Accessed January 22, 2020.

EBOLA

For the prevention of: prevention of Ebola caused specifically by *Zaire ebolavirus*.

Type of vaccine: live recombinant viral vaccine; grown in serum-free Vero cell cultures

Brand names (manufacturer): Ervebo® (Merck and Co, Inc.)

Dose and route of administration:

Product	Indicated age	Dose and route of administration	Adverse effects
Ervebo®	≥ 18 years of age	Single 1 mL dose: IM vaccine	**Injection site:** Pain, swelling, redness **Systemic:** Headache, feverishness, muscle pain, fatigue, joint pain, nausea, arthritis, rash, abnormal sweating

Storage:

- Store frozen at -80°C to -60°C (-112°F to -76°F)
- Protect from light

Contraindications:

- Anaphylaxis or severe hypersensitivity to Ebola vaccine or components of the Ebola vaccine, including rice protein

Administration/Preparation Instructions:

- Vaccine must be thawed at room temperature until there is no visible ice (should appear colorless to slightly brownish-yellow liquid with no particulates); Should be used immediately after thawing (can be stored refrigerated at 2°C to 8°C (35.6°F to 46.4°F) for not more than 2 weeks or at room temperature (up to 25°C; 77°F) for no more than 4 hours); Cannot be refrozen
- Withdraw the 1 mL dose from the vial using a sterile needle and syringe
- Administration sites:
  - Inject a 1 mL dose intramuscularly, preferably in the deltoid area of the non-dominant arm

Spacing Requirements with Other Vaccines:

- Separate from other live vaccines by at least 28 days

Accelerated Dosing Regimen:

- Not applicable

Additional Information:

- Vaccinated individuals should continue to adhere to infection control practices to prevent Zaire ebolavirus infection and transmission.
- Currently, ACIP recommends pre-exposure vaccination for those at highest risk for potential occupational exposure because they are responding to an outbreak, work as healthcare personnel at federally designated US Ebola treatment centers, or work as laboratorians/staff at biosafety level 4 US facilities
- Duration of protection unknown and only protects against strains caused by *Zaire ebolavirus*; unknown effectiveness if coadministered with antiviral, immunoglobulin, or plasma/blood transfusion
- Following vaccination, individuals may test positive for anti-Ebola glycoprotein (GP) antibody and/or Ebola GP nucleic acid or antigens
- No adequate, well-controlled studies in pregnancy; Human data is insufficient to establish the presence or absence of drug-associated risk during pregnancy

References:

- ERVEBO® [Package Insert]. Whitehouse Station, NJ: Merck & Co, Inc.; 2019
- Food and Drug Administration. FDA News Release: First FDA-approved vaccine for the prevention of Ebola virus disease, marking a critical milestone in public health preparedness and response. Available from https://www.fda.gov/news-events/press-announcements/first-fda-approved-vaccine-prevention-ebola-virus-disease-marking-critical-milestone-public-health. Accessed January 22, 2020.
- Choi MJ, Cossaboom CM, Whitesell AN, et al. Use of Ebola Vaccine: Recommendations of the Advisory Committee on Immunization Practices, United States, 2020. MMWR Recomm Rep 2021;70(No. RR-1):1–12. DOI: http://dx.doi.org/10.15585/mmwr.rr7001a1external icon

DENGUE

For the prevention of: All serotypes of dengue virus (1, 2, 3, and 4)
Type of vaccine: Live Dengue Tetravalent Vaccine
Brand names (manufacturer): Dengvaxia® (Sanofi Pasteur)

Dose and route of administration:

Product	Indicated age	Dose and route of administration	Adverse effects
Dengvaxia®	Approved for use in individuals 9 through 16 years of age with laboratory-confirmed previous dengue infection and living in endemic areas (US territories of American Samoa, Puerto Rico, and the US Virgin Islands).	Three doses (0.5 mL each) given subcutaneously 6 months apart (at month 0, 6, and 12)	**Injection site:** Pain **Systemic:** Headache, malaise, asthenia, myalgia

Storage:

- Store lyophilized vaccine antigen and saline diluent in a refrigerator at 2°C to 8°C (36°F to 46°F); Do not freeze
- Protect from light

Contraindications:

- Anaphylaxis or severe hypersensitivity reaction to a previous dose of the vaccine or any component of the vaccine
- Do not administer to individuals with severe immunodeficiency or immunosuppression due to disease or therapy

Administration/Preparation Instructions:

- Package contains a vial of lyophilized vaccine antigen and a vial of saline diluent (0.4% NaCl) and must be reconstituted
- To reconstitute: Remove the "flip-off" caps, cleanse the lyophilized vaccine antigen and diluent vial stoppers with a suitable germicide (Do not remove the vial stoppers or metal seals holding them in place); Use a sterile needle and syringe to withdraw 0.6 mL from the diluent vial and inject it into the vial of the lyophilized vaccine antigen; Swirl the vial gently to mix
- After reconstitution, the suspension is colorless and may develop trace amounts of white to translucent endogenous proteinaceous particles; Discard if cloudy or contains more than trace particulates
- Changing needles between withdrawing the vaccine from the vial and injecting it into a recipient is not necessary unless the needle has been damaged or contaminated
- Vaccine must be used immediately after reconstitution or stored refrigerated at 2°C to 8°C (36°F to 46°F) to be used within 30 minutes; Discard reconstituted vaccine if not used within 30 minutes
- Administration sites:
  - Withdraw 0.5 mL of the reconstituted vaccine and administer subcutaneously (not to be used intramuscularly)

Spacing Requirements with Other Vaccines:

- Data is not available to establish the safety and immunogenicity of concomitant administration with other recommended adolescent vaccines

Accelerated Dosing Regimen:

- Not applicable

Additional Information:

- Not approved for use in individuals not previously infected by any dengue virus serotype or for whom this information is unknown
  - In unvaccinated individuals, first dengue infections rarely cause severe dengue, while second dengue infections with a different serotype are associated with an increased risk of severe dengue
  - Administration to individuals not previously infected by dengue virus is associated with an increased risk of severe dengue disease when the vaccinated individual is subsequently infected with any dengue virus serotype
  - Evaluate individuals for prior dengue infection to avoid vaccinating individuals who have not been previously infected by dengue virus
    - Previous infection by dengue virus can be evaluated through a medical record of previous laboratory-confirmed dengue infection or serotesting prior to vaccination
    - No FDA cleared test available to determine a previous dengue infection and available non-FDA cleared tests may yield false positive results
- Safety and effectiveness have not been established in individuals living in dengue non-endemic areas who travel to dengue endemic areas
- Educate patients to seek medical care if they develop signs and symptoms of dengue fever with particular attention to severe dengue warning signs (e.g., high fever, severe abdominal pain or tenderness, persistent vomiting, mucosal bleeding, somnolence, and hyperactivity)
- Drug interactions:
  - Immunosuppressive therapies, including irradiation, antimetabolites, alkylating agents, cytotoxic drugs, and corticosteroids (used in greater than physiologic doses), may reduce the immune response to the vaccine
- May cause temporary depression of tuberculin purified protein derivative (PPD) test sensitivity, leading to false negative results
- Vaccination may not protect all individuals so recommend continued personal protection measures against mosquito bites after vaccination
- No adequate, well-controlled studies in pregnancy; Human data is insufficient to establish the presence or absence of drug-associated risk during pregnancy
- Note: no formal recommendations have been made by ACIP as of 01/2021

References:

- DENGVAXIA® [Package Insert]. Swiftwater, PA: Sanofi Pasteur Inc.; 2019

COVID-19 TRAVEL GUIDANCE

COVID-19 travel recommendations: As the COVID-19 pandemic evolves, travel recommendations will vary by location. Please visit https://www.cdc.gov/coronavirus/2019-ncov/travelers/map-and-travel-notices.html for the CDC's latest guidance regarding COVID-19 recommendations by destination.

CATCH-UP SCHEDULES

Catch-up vaccination needs: Based on vaccination history, a patient may need additional vaccines not typically considered "travel vaccines." Please visit https://www.cdc.gov/vaccines/schedules/hcp/imz/catchup.html#guidance for the CDC's latest guidance on catch-up schedules.

Travel Health Medications

1. Malaria chemoprophylaxis
    a. Atovaquone-proguanil
    b. Chloroquine & Hydroxychloroquine
    c. Doxycycline
    d. Mefloquine
    e. Primaquine
    f. Tafenoquine

2. Traveler's Diarrhea treatment
    a. Antibiotics
        i. Azithromycin
        ii. Levofloxacin
        iii. Ciprofloxacin
        iv. Ofloxacin
        v. Rifamycin
        vi. Rifaximin
    b. Antimotility Agents
        i. Loperamide
        ii. Diphenoxylate
    c. Oral Rehydration Therapy

3. Altitude Sickness
    a. Acetazolamide
    b. Dexamethasone
    c. Nifedipine
    d. Tadalafil
    e. Sildenafil
    f. Gingko Biloba

4. Insect Repellents
    a. DEET-containing products
    b. Picaridin-containing products
    c. Oil of lemon eucalyptus


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