



EVOLVE

Travel Vaccines Info Guide

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Did you know?:

As of December 2016, pharmacists are now able to dispense & administer travel vaccinations in Ontario.

BACILLUS CALMETTE-GUERIN

Name: BCG Freeze Dried Glutamate vaccine, BCG Vaccine, BCG Vaccine, BCG vaccine (Freeze Dried) - Intradermal; Not available in Canada

Epidemiology and about the disease:

Mycobacterium tuberculosis (TB) is an infectious bacterium spread by airborne droplets that affects the lungs and sometimes other sites as well.

TB is the second leading cause of death from an infectious disease and about one-third of the world's population is infected with TB. The bacterium is endemic to Africa and Asia but 60% of new cases arise from: India, Indonesia, China, Nigeria, Pakistan, and South Africa. In 2010, Canada reported an incidence rate of 4.6 per 100 000 people from which two-thirds are foreign born individuals and one fifth are Aboriginal peoples.

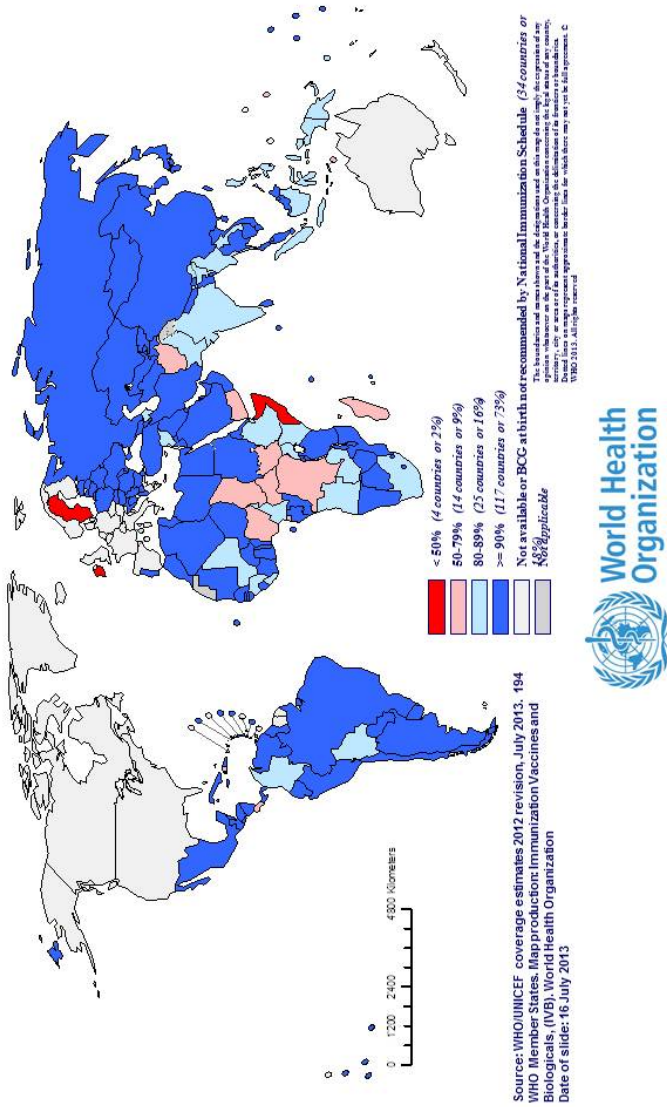
Mechanism of Action: Live attenuated vaccine

Age range and Administration:

Infants (12 months of age and younger): 0.05 mL (0.05 mg) intradermal. Children (greater than 12 months of age) and adults: 0.1 mL (0.1 mg). Administer by intradermal injection into the most superficial layers of the skin.

How often does it need to be given: No booster dose needed

Immunization coverage with BCG at birth, 2012



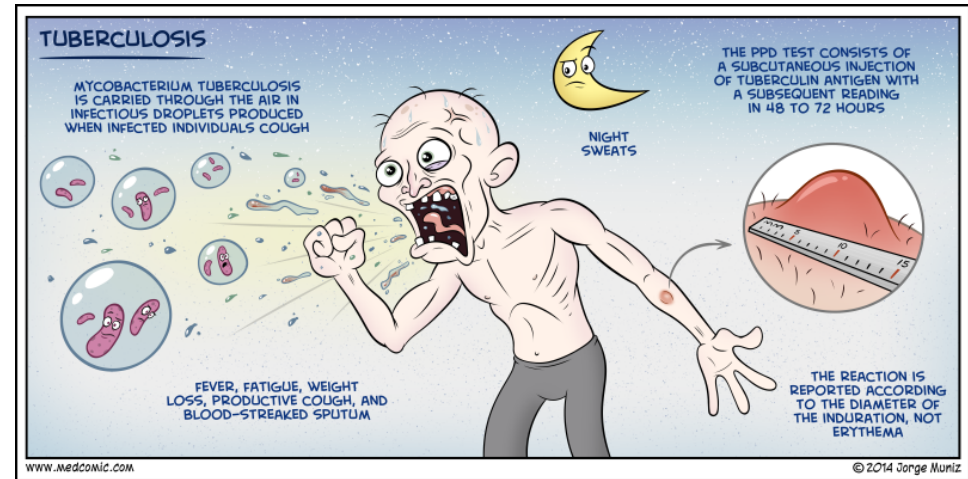
Coverage and how well it protects you:

Demonstrates conflicting results; One meta-analysis reported 51% efficacy in the prevention of TB. In newborns, evidence indicates 78% protection against disseminated TB.

Adverse Effects:

In about 50% of patients, administration causes erythema and either a papule or ulceration, followed by a scar at the site. Another 2-4% of patients develop a keloid scar. Non-suppurative regional lymphadenopathy occurs in 1% to 10%.

Cost: Adult: \$60 each (series of 2); Children: \$30 (series of 2)



Bottom line for the BCG vaccine:

It is currently not recommended for routine use anyone in Canada. It is more of an international vaccine, given at birth.

HEPATITIS A

Name: Avaxim, Havrix, VAQTA

Epidemiology and about the disease:

Mainly occurring in developing countries, the risk of hepatitis A infection is associated with a lack of safe water, and poor sanitation and hygiene (such as dirty hands). The disease in general occurs everywhere except Canada, USA, Western Europe, Scandinavian countries, Japan, New Zealand, and Australia. Hepatitis A is a hepatic disease that can be transmitted via the fecal-oral route (this occurs when someone ingests food/drink that is contaminated with the feces of someone who has Hepatitis A).

Mechanism of Action: Inactivated virus vaccine

Age range and administration: One year or older (however: pharmacists may administer vaccines to patients 5 years or older). Administer by intramuscular injection.

How often does it need to be given: Given in 2 doses, 6 months apart.

Coverage and how well it protects you: Nearly 100% effective.

Adverse Effects: Fever, reaction at the injection site, headache.

Cost: About \$40-\$70. Prices vary depending on site of administration.

Interesting fact about HepA vaccine:
Acceptable for use during pregnancy and for immunocompromised individuals.

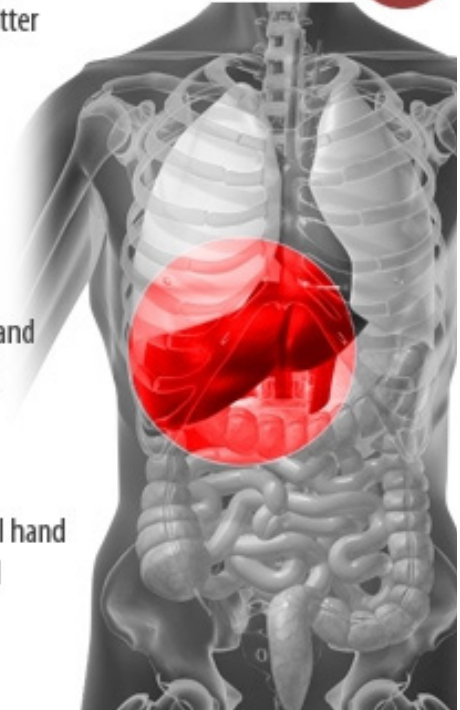
- 1 Is a viral infection of the liver spread when faecal matter enters the mouth



- 2 May last several weeks and can be debilitating but most people recover completely

- 3 Preventable with careful hand washing, keeping toilets and bathrooms clean, avoiding infected water sources

HEPATITIS A



SPREAD BY



and any other objects handled by the infected person

SYMPTOMS INCLUDE



HEPATITIS B

Name: Engerix-B, INFANRIX hexa, RECOMBIVAX HB

Epidemiology and about the disease:

Hepatitis B virus targets and infects the liver leading to complications and damage to the liver. Hepatitis B is transmitted through contaminated blood and other body fluids. Hepatitis B affects an estimated 240 million people in the world.

Countries or areas with moderate to high risk for Hepatitis B in the world include Asia, Europe, South and Central America, Africa, and the Middle East.

Mechanism of Action: Inactivated virus vaccine

Age range and administration:

Hepatitis B vaccine is recommended for all ages especially individuals in high risk groups such as infants born to HB-infected mothers and travellers visiting areas of high risk. It is administered via an intramuscular injection.

How often does it need to be given:

The hepatitis B vaccine is given as a series of 2, 3 or 4 shots (injections) in the upper arm or leg. For babies, the time between the first and second shot should be at least 1 month. The time between the second and third shot should be at least 2 months, ideally it should be 4 months or more. For teenagers aged 11-15, a two-shot series is available. The time between the first and second shot should be at least 5 months.

Interesting fact about HepB:

Hepatitis B is 50-100 more infectious than HIV (Human immunodeficiency virus), the virus that causes AIDS.

Coverage and how well it protects you:

Should be covered from hepatitis B virus one month after administering the full dose vaccination schedule. The hepatitis B vaccine is 95% to 100% effective pre-exposure to virus.

Adverse Effects:

The hepatitis B vaccine is well tolerated in patients. However, some people may experience soreness at the injection site. Some people may also experience headache and fatigue after receiving the vaccination.

Cost: Hepatitis B vaccinations are covered by Ontario Health Insurance (OHIP).

Warning Signs of Hepatitis B:



JAPANESE ENCEPHALITIS

Name: IXIARO

Epidemiology and about the disease: Japanese encephalitis virus (JEV) is the most important cause of viral encephalitis in Asia. It is a mosquito-borne flavivirus, and belongs to the same genus as dengue, yellow fever and West Nile viruses. The first case was reported in 1871 in Japan. Today, Japanese encephalitis primarily occurs in China, India, Indonesia, Thailand and Vietnam.

Mechanism of Action: Inactivated virus vaccine

Age range and administration:

Can be administered to those over 18 years old. It is an intramuscular injection.

How often does it need to be given:

Recommended dose and dosing adjustment: 2 separate doses of 0.5 mL each per the following schedule. First dose at day 0 and second dose 28 days after first dose. Primary immunization should be done at least 1 week before travel/ potential exposure to Japanese Encephalitis Virus.

Booster dose should be given (third dose) within 12-24 months after recommended primary immunization, prior to re-exposure to JEV. People who are at a continuous risk for acquiring JEV should receive a booster dose at month 12 after primary immunization

Interesting fact about JE:

There is no cure for the disease. Treatment is focused on relieving severe clinical signs and supporting the patient to overcome the infection.

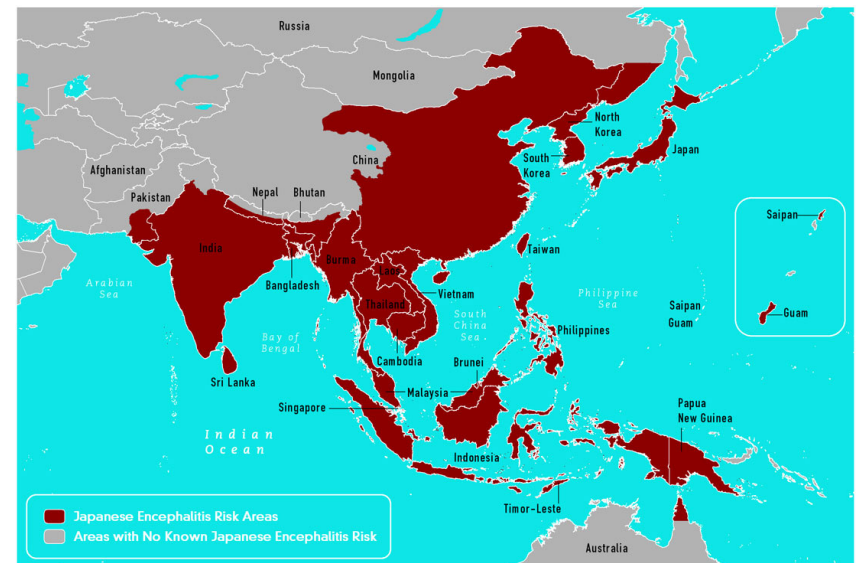
Coverage and how well it protects you:

Protection begins around 10-14 days after first exposure to JE vaccine. Thus people should allow for 10-14 days before any potential exposure to JE, to develop adequate antibody response.

No efficacy or effectiveness data exist for this vaccine, but it has been authorized for use based on non-inferiority of serologic response compared to the previous mouse brain-derived JE vaccine and to the WHO threshold for protective antibody titre.

Adverse Effects: Tenderness or pain, redness, and hardening are the most common vaccination site reactions. Systemic side effects include headache, muscle pain, fatigue, and influenza-like illness.

Cost: Variable, but usually more than \$210 for each dose.



RABIES

Name: Imovax Rabies or Rabavert suspension for injection

Epidemiology and about the disease:

Rabies is a viral infection that effects the central nervous system. It is usually transmitted to humans via bites of an infected mammal, particularly dogs, raccoons and bats. The incubation period can vary and depends on how far away from the brain the virus is when it entered the body. Incubation period can vary from several days to even years, however most commonly it is between 3-8 weeks.

Rabies is most common in areas where rabies is especially common in Africa, Asia, India, Indonesia, and Central and South America.

Mechanism of Action: Inactivated virus vaccine

Age range and administration: Can be administered to all age groups. It is administered intramuscularly.

How often does it need to be given: Usually given as three 1.0 mL intramuscular (IM) doses into the outer arm or thigh (in children less than 1 years old) given on days 0, 7 and any time between days 21 to 28.

Coverage and how well it protects you:

Immunity develops 7-14 days after the injections. It is a very effective vaccine, as it makes antibodies that prevent the virus

Interesting fact about this vaccine:

Pregnant women or women at risk of pregnancy should consider getting this vaccine if they are at risk of rabies infection, as rabies can be rapidly fatal for the fetus.

from entering the brain and spinal cord.

Adverse Effects: Abdominal pain, dizziness, and muscle aches

Cost: Approximately \$165-195 for a series of three doses

VIRUS TRANSMISSION



Saliva of infected animals



99% of human cases are caused by **dog bites**

The virus attacks the brain
Rabies is **fatal** once symptoms appear

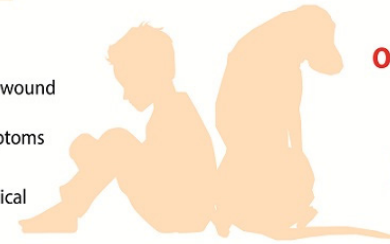


TREATMENT



Thorough washing of the wound with soap, and, vaccine injections can avoid symptoms and **save lives.**

Seek immediate medical care if bitten.



FATALITIES

Rabies affects **poor rural communities** mostly in Asia and Africa



One death every:



40% of the victims are children younger than 15

HOW TO PREVENT RABIES TRANSMISSION FROM DOGS?



Raise public **awareness**

Learn **dog body language**



NO DOG BITE = NO RABIES

VACCINATING DOGS SAVES HUMAN LIVES

Rabies is 100% preventable



Vaccinating **70%** of dogs **breaks rabies transmission cycle** in an area at risk

Every dog owner is concerned



TYPHOID

Name: VIVOTIF (ORAL) or ViVAXIM (IM)

Epidemiology and about the disease:

Typhoid fever is an infection caused by *Salmonella typhi* transmitted fecal-oral route through food and water contamination. About 80% of the 200-300 typhoid cases that occur annually in the U.S. are from travelers who visit countries where typhoid is endemic. Majority of endemic areas are in South Asia, with some in Southeast Asia, Caribbeans and Central/South America.

Mechanism of Action:

For Vivotif: Live attenuated vaccine

For Vivaxim: Purified Vi polysaccharide of *S. Typhi* + Inactivated Hepatitis A

Age range and administration:

5 years and older for Vivotif, but 16 years and older for Vivaxim. Vivotif contains 4 enteric-coated capsules, which are taken on alternate days (1, 3, 5, and 7).

How often does it need to be given:

For Vivotif: every 7 years for Vivotif.

For Vivaxim: every 6- 36 months for Hepatitis A virus immunity and every 3 years for typhoid immunity

Coverage and how well it protects you: Takes about 2 weeks for immunity, but does not provide 100% protection against typhoid

Interesting fact about typhoid fever:

Typhoid Mary, was the first person in the US identified as an asymptomatic carrier of the pathogen associated with typhoid fever. She was presumed to have infected 22 people, three of whom died, over the course of her career as a cook.

(and Hepatitis A if Vivaxim).

Adverse Effects:

Fever, headache, dizziness, weakness, muscle aches, or gastrointestinal tract disorders such as nausea, vomiting or diarrhea. If Vivaxim, there is possible tenderness and pain at site of injection.

Cost:

For Vivotif: \$40 - 60

For Vivaxim: \$100- 115

Typhoid Fever Prevention Strategies:



Wash hands



Drink boiled water



Clean fruits and vegetables



Get vaccinated

YELLOW FEVER

Name: YF-VAX® (Yellow Fever Vaccine)

Epidemiology and about the disease:

The word "yellow" in the name refers to the jaundice that affects some patients. The yellow fever virus is transmitted by mosquitos and upon infection in humans, the virus incubates for 3-6 days. Many people don't experience symptoms, but those that do commonly experience symptoms fever, muscle pain, headache, loss of appetite, nausea and vomiting. These symptoms usually disappear after 3-4 days. However, a small portion of patients will experience a more toxic phase 24 hours after initial symptoms subside. Approximately 50% of patients that enter the toxic phase and may die within 7-10 days. Yellow fever is difficult to diagnose, particularly during the early stages of the disease. The more severe stages of the disease may be confused with other serious diseases.

Yellow fever virus is found in tropical and subtropical areas in Africa and South America. Transmission of the virus is highest during rainy seasons where number of mosquitos generally increase.

Mechanism of Action: Live attenuated vaccine

Age range and administration:

Indicated in persons 9 months or older to those travelling to or living in areas at risk for yellow fever virus transmission. It is a subcutaneous injection.

How often does it need to be given: Single injection of one dose

Interesting fact about this vaccine:

The yellow fever vaccine is a requirement to enter certain countries in Africa and South America.

Coverage and how well it protects you:

Protection against yellow fever virus develops 10 days after vaccination and provides lifelong protection against yellow fever disease.

Efficacy studies of the vaccine have not been performed. However, unpublished reports between those vaccinated and those that during an yellow fever epidemic in Nigeria estimated the vaccine effectiveness to be 85%.

Adverse Effects: At the injection site, possible for pain, inflammation, and swelling. In general, weakness, headache, myalgia can occur.

Cost: \$135 (can vary)

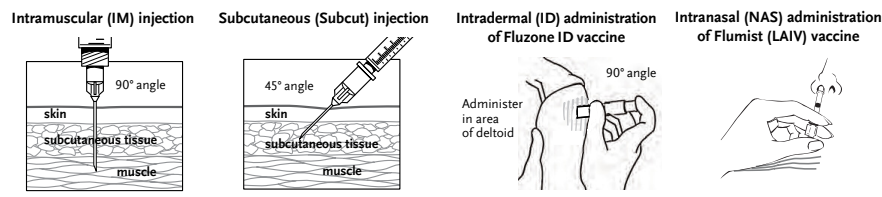


Administering Vaccines: Dose, Route, Site, and Needle Size

Vaccine	Dose	Route	Injection Site and Needle Size																																				
Diphtheria, Tetanus, Pertussis (DTaP, DT, Tdap, Td)	0.5 mL	IM	Subcutaneous (Subcut) injection Use a 23–25 gauge needle. Choose the injection site that is appropriate to the person's age and body mass.																																				
<i>Haemophilus influenzae</i> type b (Hib)	0.5 mL	IM																																					
Hepatitis A (HepA)	≤18 yrs: 0.5 mL ≥19 yrs: 1.0 mL	IM	<table border="1"> <thead> <tr> <th>AGE</th> <th>NEEDLE LENGTH</th> <th>INJECTION SITE</th> </tr> </thead> <tbody> <tr> <td>Infants (1–12 mos)</td> <td>5/8"</td> <td>Fatty tissue over anterolateral thigh muscle</td> </tr> <tr> <td>Children 12 mos or older, adolescents, and adults</td> <td>5/8"</td> <td>Fatty tissue over anterolateral thigh muscle or fatty tissue over triceps</td> </tr> </tbody> </table>	AGE	NEEDLE LENGTH	INJECTION SITE	Infants (1–12 mos)	5/8"	Fatty tissue over anterolateral thigh muscle	Children 12 mos or older, adolescents, and adults	5/8"	Fatty tissue over anterolateral thigh muscle or fatty tissue over triceps																											
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<small>Persons 11–15 yrs may be given Recombivax HB (Merck) 1.0 mL adult formulation on a 2-dose schedule.</small>																																							
Human papillomavirus (HPV)	0.5 mL	IM	Intramuscular (IM) injection Use a 22–25 gauge needle. Choose the injection site and needle length that is appropriate to the person's age and body mass. <table border="1"> <thead> <tr> <th>AGE</th> <th>NEEDLE LENGTH</th> <th>INJECTION SITE</th> </tr> </thead> <tbody> <tr> <td>Newborns (1st 28 days)</td> <td>5/8"</td> <td>Anterolateral thigh muscle</td> </tr> <tr> <td>Infants (1–12 mos)</td> <td>1"</td> <td>Anterolateral thigh muscle</td> </tr> <tr> <td rowspan="2">Toddlers (1–2 years)</td> <td>1–1 1/4"</td> <td>Anterolateral thigh muscle</td> </tr> <tr> <td>5/8–1"</td> <td>Deltoideus muscle of arm</td> </tr> <tr> <td rowspan="2">Children and teens (3–18 years)</td> <td>5/8–1"</td> <td>Deltoideus muscle of arm</td> </tr> <tr> <td>1–1 1/4"</td> <td>Anterolateral thigh muscle</td> </tr> <tr> <td>Adults 19 years or older</td> <td></td> <td></td> </tr> <tr> <td>Female or male <130 lbs</td> <td>5/8–1"</td> <td>Deltoideus muscle of arm</td> </tr> <tr> <td>Female or male 130–152 lbs</td> <td>1"</td> <td>Deltoideus muscle of arm</td> </tr> <tr> <td>Female 153–200 lbs</td> <td rowspan="2">1–1 1/2"</td> <td rowspan="2">Deltoideus muscle of arm</td> </tr> <tr> <td>Male 130–260 lbs</td> </tr> <tr> <td>Female 200+ lbs</td> <td rowspan="2">1 1/2"</td> <td rowspan="2">Deltoideus muscle of arm</td> </tr> <tr> <td>Male 260+ lbs</td> </tr> </tbody> </table>	AGE	NEEDLE LENGTH	INJECTION SITE	Newborns (1st 28 days)	5/8"	Anterolateral thigh muscle	Infants (1–12 mos)	1"	Anterolateral thigh muscle	Toddlers (1–2 years)	1–1 1/4"	Anterolateral thigh muscle	5/8–1"	Deltoideus muscle of arm	Children and teens (3–18 years)	5/8–1"	Deltoideus muscle of arm	1–1 1/4"	Anterolateral thigh muscle	Adults 19 years or older			Female or male <130 lbs	5/8–1"	Deltoideus muscle of arm	Female or male 130–152 lbs	1"	Deltoideus muscle of arm	Female 153–200 lbs	1–1 1/2"	Deltoideus muscle of arm	Male 130–260 lbs	Female 200+ lbs	1 1/2"	Deltoideus muscle of arm	Male 260+ lbs
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Influenza, live attenuated (LAIV)	0.2 mL (0.1 mL in each nostril)	Intranasal spray																																					
Influenza, inactivated (IIV), recombinant (RIV), for ages 18 years and older	6–35 mos: 0.25 mL ≥3 yrs: 0.5 mL	IM																																					
Influenza (IIV) Fluzone Intradermal, for ages 18 through 64 years	0.1 mL	ID																																					
Measles, Mumps, Rubella (MMR)	0.5 mL	Subcut																																					
Meningococcal conjugate (MCV4 [MenACWY])	0.5 mL	IM																																					
Meningococcal serogroup B (MenB)	0.5 mL	IM																																					
Meningococcal polysaccharide (MPSV)	0.5 mL	Subcut																																					
Pneumococcal conjugate (PCV)	0.5 mL	IM																																					
Pneumococcal polysaccharide (PPSV)	0.5 mL	IM or Subcut																																					
Polio, inactivated (IPV)	0.5 mL	IM or Subcut																																					
Rotavirus (RV)	Rotarix: 1.0 mL Rotateq: 2.0 mL	Oral																																					
Varicella (Var)	0.5 mL	Subcut																																					
Zoster (Zos)	0.65 mL	Subcut																																					
Combination Vaccines																																							
DTaP-HepB-IPV (Pediarix) DTaP-IPV/Hib (Pentacel) DTaP-IPV (Kinrix; Quadacel) Hib-HepB (Comvax) Hib-MenCY (MenHibrix)	0.5 mL	IM																																					
MMRV (ProQuad)	≤12 yrs: 0.5 mL	Subcut																																					
HepA-HepB (Twinrix)	≥18 yrs: 1.0 mL	IM																																					

* A 5/8" needle may be used for patients weighing less than 130 lbs (<60 kg) for IM injection in the deltoid muscle only if the skin stretched tight, the subcutaneous tissue is not bunched, and the injection is made at a 90-degree angle.

NOTE: Always refer to the package insert included with each biologic for complete vaccine administration information. CDC's Advisory Committee on Immunization Practices (ACIP) recommendations for the particular vaccine should be reviewed as well. Access the ACIP recommendations at www.immunize.org/acip.



TOP 5 QUESTIONS TO ASK YOUR PATIENTS

Q1: Can you schedule a 20-minute appointment to discuss your travel plans?

Q2: Where are you going? (resort travel, non-yellow fever areas, or yellow-fever areas?)

Q3: What type of activities are you doing during your stay?

Q4: How long are you staying there?

Q5: How is your overall health and do you have other conditions?

