TRAVEL CLINIC

VACCINE REFERENCE GUIDE

REVISED – June, 2015

This Reference Guide was compiled for the Travel Clinic staff at Vancouver Coastal Health. It is meant to provide at-a-glance information. For more detailed information on vaccines and the diseases they prevent, please consult the Canadian Immunization Guide.

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For Non-Travel Vaccines, Please Refer To The BCCDC Immunization Manual www.bccdc.org

ANTIGEN ⇒	CHOLERA/TRAVELLER'S DIARRHEA (Dukoral)
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Resistance to Ciprofloxacin is reported in Cambodia, Laos, Thailand, Vietnam, India, Nepal and summertime in Mexico (June, July and August). Use Azithromycin[1] in travellers to these countries

NEJM, May 2, 2013 "Use of Azithromycin and death from cardiovascular causes"

"Cardiovascular risks with azithromycin and other antibacterial drugs"

These studies led Shoreland to conclude "Travellers who develop diarrhea should avoid azithromycin, other macrolide antibiotics and fluoroquinolones if they have cardiovascular disease."

Cardiovascular disease is defined as: history of angina, previous MI, angioplasty, cardiac bypass, Q-T prolongation and arrythmias (antiarrythmic agents: quinidine, procainamide, disapyramide (Rhythmodan) dofetelide (Tikosyn), amiodarone (Cordarone), sotalol, dronedarone (Multaq), ibutilide (Covert).

Travellers with cardiovascular disease should be prescribed cefixime (Suprax) 200 mg BID for 3 days. Discontinue as soon as diarrhea stops. (Suprax will not be available until late 2015.)

	HEPATITIS A (AVAXIM)
DOSAGE & INTERVAL	Children (≥ 6 months up to and including 15 years of age) Dose 1 0.5ml I.M. (80 antigen units) Dose 2 0.5ml I.M.(6 – 12 months after dose 1) Adults (Licensed for those ≥ 12 years of age) Dose 1 0.5ml I.M. (160 antigen units) Dose 2 0.5ml I.M.(160 antigen units) (6 – 12 months after dose 1)(official booster dose) 0.25ml I.M. (80 antigen units) – off label use For those 12 -15 years of age, either pediatric or adult formulations of Avaxim may be used. Pediatric is less expensive) See criteria for provincially funded vaccine, BCCDC Manual
ROUTE	I.M. Deltoid
BOOSTER	Currently no official recommendation, probably life.
VACCINE TYPE	Inactivated virus
EFFECTIVENESS	100%
ADEQUATE ANTIBODY LEVEL	Day 14-19
SIDE EFFECTS	Local - redness and tenderness Systemic - mild fever - myalgia - headache
CONTRAINDICATED	Problems in pregnant women have not been documented and are unlikely. History of anaphylactic reaction to a previous dose of Hepatitis A vaccine or any of its components
RESTRICTED TIME WITH OTHER VACCINES	None
DELAYED BLOOD DONATION	Probably 2 days
METHOD OF CONTRACTION	Contaminated food and water.
VACCINE COMPONENTS	Adjuvant – aluminum hydroxide Preservative – None Others: formaldehyde, aluminum hydroxide, neomycin, 2-phenoxyethanol.

	HEPATITIS A (HAVRIX)
DOSAGE & INTERVAL	Children (6 mos -18 years) Dose 1 - 720 IU (0.5ml I.M.) Dose 2 - 360 IU, or 720 IU 6 - 12 mos after Adults 19 years and up Dose 1 - 1440 IU (1.0ml I.M.) (Adult dose may also be used at 16 years and up) Dose 2 - 720 IU, 6 - 12 mos after See criteria for provincially funded vaccine in BCCDC Manual.
ROUTE	I.M. (Deltoid)
BOOSTER	Currently no official recommendation, probably life. Post vaccination testing is not indicated following a Hepatitis A vaccine series.
VACCINE TYPE	Inactivated Viral
EFFECTIVENESS	After 1st dose - 100% at 3 wks. Given the good serologic response to vaccine after primary dose, simultaneous administration of IG is not indicated.
ADEQUATE ANTIBODY LEVEL	Day 14-19
SIDE EFFECTS	Local - redness and tenderness. Systemic - (mild) headache, malaise, fever and nausea.
CONTRAINDICATED	Problems in pregnant women have not been documented and are unlikely. History of an anaphylactic reaction to a previous dose of any Hepatitis A vaccine or to any of its components.
RESTRICTED TIME WITH OTHER VACCINES	Concomitant administration of IG may result in lower anti HAV than when vaccine given alone.
DELAYED BLOOD DONATION	2 days
METHOD OF CONTRACTION	Contaminated food and water
VACCINE COMPONENTS	Adjuvant – aluminum hydroxide Preservative – 2-phenoxyethanol Other: formaldehyde, polysorbate 20, neomycin B sulphate, potassium chloride, disodium phosphate, monopotassium phosphate, sodium chloride, bovine serum albumin, amino acids.

	HEPATITIS A (VAQTA)
DOSAGE & INTERVAL	Children (6 mos - 17 yrs) Dose 1 0.5ml Dose 2 0.5ml (6 – 12 mos later) Adults (18 yrs & up) Dose 1 1.0ml Dose 2 1.0 ml – official booster dose (6 – 12 mos later) 0.5ml – off label use (6 – 12 mos later) See criteria for provincially funded vaccine, BCCDC Manual
ROUTE	I.M. Deltoid
BOOSTER	Currently no official recommendation, probably life.
VACCINE TYPE	Inactivated virus
EFFECTIVENESS	100%. Simultaneous administration of IG is **NOT** indicated
ADEQUATE ANTIBODY LEVEL	Day 14-19
SIDE EFFECTS	Local - redness and tenderness Systemic - abdominal pain 1% - Pharyngitis 1% - Headache 0.5%
CONTRAINDICATED	Problems in pregnant women have not been documented and are unlikely. History of anaphylactic reaction to a previous dose of Hepatitis A vaccine or any of its components
RESTRICTED TIME WITH OTHER VACCINES	None
DELAYED BLOOD DONATION	Probably 2 days
METHOD OF CONTRACTION	Contaminated food and water.
VACCINE COMPONENTS	Adjuvant – aluminum hydroxide Preservative – None Others: bovine albumin, formaldehyde, neomycin B sulphate, sodium borate, sodium chloride

ANTIGEN ⇒	HEPATITIS B (ENGERIX B/RECOMBIVAX)
DOSAGE & INTERVAL	Children (0 - 19 years) 0.5 ml given at 0-1-(2-6) mos. (ideally dose #3 should be at least 4 mos after dose #1 but any three doses are protective.) * USE T-FREE RECOMBIVAX < 15 YRS (see BCCDC manual) Adults (20 yrs and up) 1.0 ml given at 0-1-(2-6) mos. or 0,7, 21 days,12 months Accelerated series if short of time[1]: Initial dose 0-19 years 1.0 ml I.M. 20 years & up 2.0 ml I.M. (2 separate injection sites, 1.0 ml each, if ≥ 50 years of age, check serology 1 mos after booster dose at 6-12 mos. Those below protective levels should be given 1 further dose of Hepatitis B vaccine and no further serology. Booster Dose: = 6-12 mos after initial dose 0-19 years 0.5 ml I.M. 20 years & up 1.0 ml I.M. See criteria for provincially funded vaccine, BCCDC Manual
ROUTE	I.M. Deltoid
BOOSTER	Not necessary – lifetime immunity
VACCINE TYPE	Virus outer coat
EFFECTIVENESS	Depends on age: < 50, 95% > 50, 85%
ADEQUATE ANTIBODY LEVEL	Following regular schedule 2 weeks after dose #1 < 20% 2 weeks after dose #2 60-80% 2 weeks after dose #3 > 95%
SIDE EFFECTS	Local - tenderness
CONTRA-INDICATED	O.K. for pregnancy if high risk History of anaphylactic reaction to a previous dose of Hepatitis B vaccine or to any of its components
RESTRICTED TIME WITH OTHER VACCINES	None
DELAY BLOOD DONATION	3 weeks
METHOD OF CONTRACTION	Blood and body fluids
VACCINE COMPONENTS	Adjuvants – aluminum hydroxide Preservatives – Engerix B (GSK) trace thimerosal in multi-dose vials only. Single doses Engerix thimerosal free Recombivax (Merck) single doses thimerosal free and multi doses 0.005% thimerosal Others: traces of yeast (only Recombivax NOT Engerix)

[1]"A double-dose Hepatitis B vaccination schedule in travellers presenting for late consultation" S. Hollenberg, 2012

Age <50 – 93.1% seroprotected

Age ≥50 – 79.6% seroprotected

ANTIGEN ⇒	HEPATITIS A & HEPATITIS B VACCINE (TWINRIX)
DOSAGE & INTERVAL	Adults (19 years and up) 1.0 ml given at 0-1-6 mos. (each 1.0ml dose contains Havrix 720 ELU and Engerix-B 20 mcg (micrograms)) Children ≥ 6 mos -18 years[1] 0.5ml given at 0-1-6 mos Accelerated series; 0, 1 week, 3 week, one year May give 2 doses simultaneously (1.0 ml each in 2 separate injection sites as in the accelerated hep B schedule) BUT if ≥ 50 years of age, serology for hep B must be tested 1 mos after booster dose at 6-12 months (see page 7 for accelerated Hep B series).
ROUTE	I.M. Deltoid
BOOSTER	Hep A – None, lifetime immunity Hep B – Lifetime immunity
VACCINE TYPE	Inactivated virus and viral outercoat
EFFECTIVENESS	See Havrix and Engerix B
ADEQUATE ANTIBODY LEVEL	1 mos. after dose #2 99% seroconvert and are protected against Hep A 96% seroconvert and are protected against Hep B
SIDE EFFECTS	Local redness and tenderness. Systemic (mild) headache, malaise, fever and nausea.
CONTRAINDICATED	Pregnancy - as with all inactivated vaccines, one does not expect harm to the fetus[2] History of anaphylactic reaction to a previous dose of Twinrix or one of its components
RESTRICTED TIME WITH OTHER VACCINES	Concomitant administration of I.G. may result in lower anti-HAV than when vaccine given alone.
DELAY BLOOD DONATION	3 weeks.
METHOD OF CONTRACTION	Food and water/blood and body fluids.
VACCINE COMPONENTS	Adjuvant – aluminum hydroxide Preservative – 2-phenoxyethanol Others: neomycin sulfate, formaldehyde, aluminum phosphate, sodium chloride, polysorbate 20

[1] If pediatric Twinrix is not available, give 1.0 ml of adult Twinrix at 0 time and 6-12 mos

[2] Twinrix Product Monograph.

ANTIGEN ⇒	HUMAN PAPILLOMA VIRUS 9 (GARDASIL) (HPV types 6, 11, 16, 18, 31, 33, 45, 52, 58)
DOSAGE & INTERVAL	Approved for use in women 9 - 45 years old, men 9 - 26 years old, MSM 27 years and older. Can be used "off label" in males 26-45 years old. Schedule 0, 2 mos., 6 mos. (No information on accelerated schedule or adolescent school based program as of May 2015.)
ROUTE	0. 5 ml I.M.
STABILITY	Single dose vials or syringes, use immediately.
BOOSTER	Duration of immunity unclear, at least 8 years.
VACCINE TYPE	Highly purified virus-like particles.
ADEQUATE ANTIBODY LEVEL	99.5% seroconverted 1 month after third dose
SIDE EFFECTS	Mild to moderate pain, redness, swelling at injection site. Headaches.
CONTRA-INDICATED	No studies in HIV infected individuals, <9 years old, > 45 years old. History of anaphylactic reaction to previous dose of HPV vaccine. Try not to vaccinate pregnant women. Merck maintains a pregnancy registry to monitor fetal outcomes of pregnant women exposed to Gardasil. The vaccine has not been associated with teratogenicity. May be administered to lactating women.
VACCINE COMPONENTS	Amorphous aluminum hydroxyphosphate sulphate, L-histidine, polysorbate 80, sodium borate, yeast

ANTIGEN ⇒	HUMAN PAPILLOMA VIRUS (GARDASIL) (HPV types 6, 11, 16, 18)
DOSAGE & INTERVAL	Approved for use in women 9 - 45 years, men 9 - 26 years, MSM 27 years and older. May be used off label in men 26 – 45 years 0, 2 mos., 6 mos. [1] Accelerated schedule 0,1,4 mos (2nd dose at least 1 mos. after first, 3rd dose at least 3 mos. after second School based program: 2 doses (girls 9-14 yrs) 6 mos apart. May also be used for boys 9 -14 yrs (2 doses, 6 months apart). Please check BCCDC Manual for list of girls who qualify for free vaccine.
ROUTE	0. 5 ml I.M.
STABILITY	Single dose vials or syringes, use immediately.
BOOSTER	Duration of immunity unclear, at least 8 years.
VACCINE TYPE	Highly purified virus-like particles.
ADEQUATE ANTIBODY LEVEL	99.5% seroconverted 1 month after third dose
SIDE EFFECTS	Mild to moderate pain, redness, swelling at injection site. Headaches.
CONTRA-INDICATED	No studies in HIV infected individuals, <9 years of age, > 45 years of age. History of anaphylactic reaction to previous dose of HPV vaccine. Try not to vaccinate pregnant women. Merck maintains a pregnancy registry to monitor fetal outcomes of pregnant women exposed to Gardasil. The vaccine has not been associated with teratogenicity. May be administered to lactating women.
VACCINE COMPONENTS	Amorphous aluminum hydroxyphosphate sulphate, L-histidine, polysorbate 80, sodium borate, yeast

[1] efficacy has been demonstrated in individuals who have received all 3 doses within a 1 year period. If alternate vaccination schedule is necessary, the second dose should be administered at least one month after the first dose and third dose administered at least 3 months after the second dose.

Provided free to women born in 1994 or later who are in grade 6 and older.

Feb 2015: Until supplies last, the Travel Clinic will have free Gardasil for men & women born 1989 and later. Boys & girls aged 9 – 14 should have 2 doses 6 months apart. All other ages should have 3 doses at 0, 2 mos, and 6 mos.

ANTIGEN ⇒	HUMAN PAPILLOMA VIRUS (CERVARIX) (HPV types 16, 18)
DOSAGE & INTERVAL	3 doses 0, 1 mos., 6 mos. **One time catch-up program** (until vaccine depleted or expires 08-2015) April 2012: Females born 1991 – 1993. July 2013: Program expanded to include women ≤ 26 (birth year 1987) at time of series commencement
ROUTE	0. 5 ml I.M.
STABILITY	Single dose syringes.
BOOSTER	Duration of immunity at least 9.4 years. No booster doses recommended at this time
VACCINE TYPE	Recombinant viral particles.
ADEQUATE ANTIBODY LEVEL	99.5% seroconverted 1 month after third dose
SIDE EFFECTS	Pain, redness, swelling at injection site. Fatigue, myalgia, arthralgia, headache..
CONTRA-INDICATED	History of anaphylaxis to previous dose of Cervarix, latex in syringe. Females who are immunocompromised either from disease or medication can receive this vaccine but vaccine efficacy may be less. Try not to vaccinate pregnant women because safety has not been adequately demonstrated.
VACCINE COMPONENTS	3-0-desacyl-4-monophospharyl, lipid A (MPL) aluminum hydroxide (ASO4 adjuvant) sodium chloride, sodium dihydrogen phosphate dihydrate

Nov/14 No longer available, kept for historical purposes.

ANTIGEN ⇒	JAPANESE ENCEPHALITIS (IXIARO)
DOSAGE & INTERVAL	Approved for use in ≥ 2 mos. and older Two doses 0.5 ml 0, 28 days (a single dose produces low anti-bodies in 20% of recipients.(This may be shortened to 0,7 days without a drop in efficacy.) [1,2] Pediatric use ≥ 3 years 6 ug/0.5 ml, 2 doses 7-28 days apart 2 mos – <3 years 3 ug/0.25 ml, 2 doses 7-28 days apart
ROUTE	I.M.
BOOSTER	1 year after primary series if risk continues. (Booster after one year or longer provides protection for 10 years. [3]) Following previous immunization with JE-Vax: Persons >17 years who were previously vaccinated with JE-Vax who require further immunization should receive one dose of Ixiaro ≥ 2 years after the primary JE-Vax series. This will provide protection for an additional 2 years [4]
.	Inactivated viral
EFFECTIVENESS	29.4 % seroconversion 10 days after dose #1 97.3% seroconversion one week after dose #2[5]
ADEQUATE ANTIBODY LEVEL	One week after dose #2.
SIDE EFFECTS	-Local reactions, headaches, myalgia, nausea, rash Rare: neuritis, mild encephalitis, pruritic rash, urticaria, vertigo, vomiting (causation not proven)
CONTRAINDICATED	History of anaphylactic reaction to Ixiaro or any of its components Pregnancy – risk unknown, one case of syndactyly (webbing between fingers) reported in woman vaccinated @ 5 weeks after LMP Children < 18 yrs – limited data on safety and efficacy
RESTRICTED TIME WITH OTHER VACCINES	None
DELAY BLOOD DONATION	Probably 2 days
METHOD OF CONTRACTION	Mosquito Bite - night time biter
VACCINE COMPONENTS	Adjuvant – aluminum hydroxide, potassium dihydrogen phosphate, disodium hydrogen phosphate

[1] - Immunogenicity and safety of an accelerated dosing regimen of Japanese encephalitis inactivated absorbed vaccine for travellers: A phase III randomized study in healthy adults. Jelinek et al. Presented at 5th NECTM June 5-8, 2014
**Note-See page 14-15 Risk of Japanese Encephalitis By Country, Region, and Season.

[2] - There is limited data from one trial that the second injection can be given up to 11 months after the first one, but this is not recommended at this time

[3] - Travax Literature Watch Review – June 11, 2015

[4] - Travax Literature Watch Review – Mar 24, 2014

[5] - A seroconversion rate of 29.4% has been observed 10 days after the first vaccination, and 97.3% one week after the second vaccination.

ANTIGEN ⇒	JAPANESE ENCEPHALITIS (JE-VAX)
DOSAGE & INTERVAL	Adult [1] and children 3 years & up 1.0 ml given at day 0-7-30 Children (1-2 years) 0.5 ml given at day 0-7-30 Accelerated series for adults and children: 0-7-14. May also administer 5-7 days apart but the antibody to this is lower.
ROUTE	S.C.
STABILITY	[1]Once reconstituted use within 8 hours
BOOSTER	If primary series was 2 doses, booster at 12 months otherwise every 3 years.
VACCINE TYPE	Inactivated viral
EFFECTIVENESS	1 dose: no info 2 doses: 30 - 80% 3 doses: 99%
ADEQUATE ANTIBODY LEVEL	4 weeks after dose #2. Best after 6 weeks.
SIDE EFFECTS	-Tenderness & swelling - 10% -Mild fever, headache, rash – 20% -Delayed reaction (1/16,000 recipients) - swelling and urticaria up to 10 days after injection. (VACCINEES SHOULD STAY CLOSE TO MEDICAL CARE FOR 3-7 DAYS POST VACCINATION) - Rare (0.2/100,00 doses) encephalopathy, encephalitis, seizures, peripheral neuropathy
CONTRAINDICATED	• Immunocompromised • Pregnancy • Children < 1 year • severe allergic reaction to rodents • history of anaphylactic reaction to a previous dose of JE vaccine or any of its components
RESTRICTED TIME WITH OTHER VACCINES	None
DELAY BLOOD DONATION	2 days
METHOD OF CONTRACTION	Mosquito Bite - night time biter
VACCINE COMPONENTS	No Adjuvant, thimerosal 0.007% (preservative) Others: sucrose, gelatin, formaldehyde, proteins of rodent or neural origin.

NO LONGER AVAILABLE AS OF 2011.
KEPT FOR HISTORICAL PURPOSES
- Dr. Suni Boraston.

ANTIGEN ⇒	**JAPANESE ENCEPHALITIS (SA-14-14-2)** (Live attenuated hamster cell vaccine) Not available in North America but licensed in China, India, Nepal, South Korea and Sri Lanka. Travellers who do not have the time or funds to get vaccinated here may choose to get vaccine at destination. (Made by Chengdu Institute of Biological Products)
DOSAGE & INTERVAL	0.5 ml subcutaneous 6 mos. of age and older In China, the vaccine is routinely given at 8 months of age
STABILITY	Ideally use within one hour of reconstitution, although studies confirming reconstituted vaccine stability for at least six hours are close to completion.
BOOSTER	Studies have documented ongoing protection from a single dose for a minimum of 5 years in JE-endemic areas. Long term protection is likely. Study in Nepal reported 99.3% efficacy of a single dose. One year after the immunization, a follow-up study in the same region reported efficacy of 98.5%
VACCINE TYPE	Live, attentuated
SIDE EFFECTS	More than 1 M children followed in safety studies. Transient fever – 5-10%, local reactions, rash, irritability in no more than 1-3%. Neither acute encephalitis nor hypersensitivity reactions have been associated with this vaccine.
CONTRAINDICATED	• anaphylactic reaction to a prior dose of SA 14-14-2 JE vaccine • severe allergic reaction to gelatin, gentamycin, kanamycin • immunosuppressive states • pregnancy (no data) • the following additional contraindications are listed in official product information: acute infectious disease, renal, hepatic, or cardiac disease, active tuberculosis, otitis media and epilepsy
RESTRICTED TIME WITH OTHER VACCINES	Must be given at the same time or 4 weeks apart from other live, viral vaccines. Studies have shown that it can be safely co-administered with measles vaccine at nine months of age.
METHOD OF CONTRACTION	Mosquito Bite - night time biter

RISK OF JAPANESE ENCEPHALITIS, BY COUNTRY, REGION AND SEASON

COUNTRY	AFFECTED AREAS	TRANSMISSION SEASON	COMMENTS
Australia	Outer Islands of Torres Strait	Dec-May. (All human cases reported Feb-Apr)	1 human case reported from north Queensland mainland
Bangladesh	Little data, but probably widespread	May-October	Outbreak reported from Tangail District in 1977, sporadic cases in Rajshahi , Chittagong, Khulna, Dhaka, Sylhet, and Ranjpur
Bhutan	Little data, but probably endemic in non-mountainous areas	No data	No comments
Brunei	Presumed to be sporadic-endemic, as in Malaysia	Presumed year round transmission	No comments
Burma (Myanmar)	Presumed to be endemic countrywide	Presumed to be May to October	Repeated outbreaks in Shan State in Chiang Mai valley
Cambodia	Presumed to be endemic countrywide	Year round with peaks reported May to October	Human cases in at least 15 of 23 provinces including Phnom Penh, Takeo, Kampong Cham, Battambang, Svay Rieng, and Siem Reap
China	Cases in all provinces except Xizang (Tibet), Xinjiang and Quinghai	Jun-Oct	Vaccine not routinely recommended for travellers to urban areas only. Highest rates reported from Chongqing, Guizhou, Shaanxi, Sichaun, and Yunnan
India	Reported cases from all states except, Dadra, Daman, Diu, Gujarat, Himachal Pradesh, Jammu, Kashmir, Lakshadweep, Meghalaya, Nagar Haveli, Punjab, Rajasthan, and Sikkim	South India: Year round North India: May-Oct	Outbreaks in West Bengal, Tamil Nadu, Andrha Pradesh, Assam, Uttar Pradesh, Manipur, Goa, Haryana, Kerala, Bihar, and Karnataka
Indonesia	Presumed to be endemic countrywide	Probably year round risk; varies by island; peak risks associated with rainfall, rice cultivation and presence of pigs	Human cases in Bali, Kalimantan, Java, Nusa Tenggara, Papua and Sumatra
Japan*	Rare sporadic cases on all islands except Hokkaido	Jul-Oct	Vaccine not routinely recommended for travel to Tokyo and other major cities. Enzootic transmission without human cases observed on Hokkaido. Most recent small outbreak in 2002 reported from Chugoku
Korea	North Korea: Presumed to be endemic countrywide South Korea: Rare sporadic cases*	May-Oct	Last major outbreak in 1982. Vaccine not recommended for travel to urban areas only
Laos	Presumed to be endemic countrywide	Year round, peak Jun-Sept	Human cases in north, central and southern Laos
Malaysia	Endemic in Sarawak. Sporadic cases reported from all states	Year round transmission, peak Oct-Dec in Sarawak	Most cases from Sarawak. Vaccine not recommended for travelers to urban areas only
Nepal	Endemic in southern lowlands (Terai). Cases reported from hill and mountain districts incl. Kathmandu Valley	Jun-Oct	Vaccine not recommended for travellers visiting high altitude areas. Highest rates reported from western Terai districts
Pakistan	Limited data, human cases reported from around Karachi	Unknown	
Papua New Guinea	Limited data, probably widespread	Unknown; probably year round	Vaccine not routinely recommended. A case of JE was reported from near Port

COUNTRY	AFFECTED AREAS	TRANSMISSION SEASON	COMMENTS
			Moresby in 2004. Sporadic human cases reported from Western Province
Philippines	Presumed to be endemic on all islands	Uncertain; speculations based on locations and agroecosystems. Probably year round with peak season Jul-Sept	Outbreaks described in Nueva Ecija, Luzon , Manila, and the Visayas
Russia	Far eastern maritime areas south of Khabarovsk	Jul-Sept	
Singapore	Rare cases	Year round transmission	Vaccine not routinely recommended
Sri Lanka	Endemic in all but mountainous areas	Year round with variable peaks based on monsoon rains	Highest rates of human disease reported from Anuradhapura, Gampaha, Kurunegala, Polonnaruwa, and Puttalam districts
Taiwan	Rare, sporadic human cases island wide.	May-Oct	Routine JE vaccination introduced in 1968. Vaccine not recommended for travel to Taipei or other major cities
Thailand	Endemic countrywide, seasonal epidemics in north	Year round with seasonal peaks , May to October, esp. up North	Highest disease rates in Chiang Mai Valley; sporadic cases in Bangkok suburbs; several cases in resort/coastal areas of southern Thailand
Timor-Leste	Limited data, sporadic cases reported	No data	
Vietnam	Endemic – countrywide, seasonal epidemics in northern provinces	Year round with seasonal peaks , May to October, esp. up North	Highest rates in and near Hanoi and northwestern and northeastern provinces bordering China
Western Pacific Islands	Two epidemics reported in Guam in 1947-1948, Saipan in 1990	Uncertain; possibly Oct-Mar	Enzootic cycle might not be sustainable; epidemics might follow introductions of virus

[1]Data are based on published reports and personal correspondence. Risk assessments should be performed cautiously, because risk can vary within areas and from year to year, and surveillance data regarding human cases and JE virus transmission are incomplete.

[2]In some endemic areas, human cases among residents are limited because of natural immunity among older people or vaccination. However, because JE virus is maintained in an enzootic cycle between animals and mosquitoes, susceptible visitors to these areas still may be at risk for infection.

ANTIGEN ⇒	MENINGOCOCCAL MENINGITIS CONJUGATE A-C-Y-W 135 (Menactra)
DOSAGE & INTERVAL	9 mos to 55 years - 0.5 ml I.M[1]. Although not approved for use in 55 years and older the Travel Clinic will be using Menactra in this age group. See BCCDC Manual for info on who gets free meningococcal vaccine
ROUTE	I.M.
BOOSTER	Boost every 3 years for those at risk for Group A disease, 5 years for other groups.
VACCINE TYPE	Conjugate polysaccharide groups A, C, Y, W-135
EFFECTIVENESS	98 - 100%
ADEQUATE ANTIBODY LEVEL	10 - 14 days
SIDE EFFECTS	Local – pain 50-60%, redness, swelling. Systemic – headache 40%, fatigue, malaise. There is no evidence of increased risk of GBS associated with Menactra.
CONTRA-INDICATED	History of GBS (relative contra-indication) History of anaphylactic reaction to a previous dose of Menactra or one of its components.
RESTRICTED TIME WITH OTHER VACCINES	Meningococcal polysaccharide (Menomune) and meningococcal conjugate vaccines should be separated by 4 weeks regardless of which one was given first.
DELAY BLOOD DONATION	2 weeks
METHOD OF CONTRACTION	Droplet
VACCINE COMPONENTS	No preservative or adjuvant. Stopper contains latex – when administering to latex allergic individuals either remove stopper or use separate needles for drawing up and administering. Others: sodium chloride

[1] off label pediatric use to be used for children 2-8 months who will be staying in a zone where serogroup A is endemic or epidemic or going to Saudi Arabia during Hajj.*

Ages 2 – 8 months (off-label): 2 doses Menactra given one month apart, plus a booster dose 12 months later if at continued risk.

Ages 9 – 23 months: 2 doses Menactra, given 3 months apart (2 months apart if protection is required earlier). Give a booster dose every 3 years if at continued risk.

ANTIGEN ⇒	MENINGOCOCCAL MENINGITIS CONJUGATE A-C-Y-W 135 (Menveo)
DOSAGE & INTERVAL	2 months – 55 years
A	0.5 ml I.M.
BOOSTER	Boost every 3 years for those at risk for Group A disease, 5 years for other groups.
VACCINE TYPE	Conjugate polysaccharide groups A, C, Y, W-135
EFFECTIVENESS	No data available. Probably 98%, similar to Menactra
ADEQUATE ANTIBODY LEVEL	10 - 14 days
SIDE EFFECTS	Local – pain 50-60%, redness, swelling. Systemic – headache 40%, fatigue, malaise.
CONTRA-INDICATED	History of anaphylactic reaction to a previous dose of Menveo or one of its components. Prior history of GBS is a relative precaution.
RESTRICTED TIME WITH OTHER VACCINES	Separate from other meningococcal conjugate vaccine by 4 weeks regardless of which was given first.
DELAY BLOOD DONATION	2 weeks
METHOD OF CONTRACTION	Droplet
VACCINE COMPONENTS	Potassium dihydrogen phosphate, sodium dihydrogen phosphate, monohydrate, di-sodium hydrogen phosphate bihydrate.

MENINGOCOCCAL MENINGITIS A-C-Y-W-135 VACCINE RECOMMENDATIONS AS PER SHORELAND 2016

Benin	Dec – June
Burkina Faso	Dec – June
Cameroon	Dec – June
Central African Republic	Dec – June
Chad	Dec – June
Cote D'Ivoire	Dec – June
Congo, Democratic Republic	All year
Eritrea	Dec – June
Ethiopia	All year
Gambia	Dec – June
Ghana	Dec – June
Guinea	Dec – June
Guinea-Bissau	Dec – June
Kenya(Far Northwest only)	All Year
Mali	Dec – June
Mauritania	Dec - June
Namibia	May – Oct
Niger	Dec – June
Nigeria	Dec – June
Senegal	Dec – June
South Sudan	Dec-June
Togo	Dec – June
Uganda	Dec - June

We don't need to recommend meningococcal vaccine for the islands off the African coast: Madagascar, Mauritius, Mayotte, Comoros, Reunion, Seychelles, Cape Verde, Sao tome and Principe

Vaccine should be recommended for:

1. Individuals going to endemic countries during their high risk season.

2. Individuals attending the Hajj or any religious pilgrimage in Saudi Arabia (Visa requirement).

3. Travellers to an area of epidemic disease regardless of duration of exposure.

4. Vaccine should also be considered for individuals who travel extensively and unpredictably e.g. military and intelligence personnel, flight attendants and cabin crews.

ANTIGEN ⇒	MENINGOCOCCAL MENINGITIS B (BEXSERO)
DOSAGE & INTERVAL	See attached chart. Approved for use for 2 mos to 17 years but safe and immunogenic up to 55 years (May be used off label in 17 – 55 yrs/o at Travel Clinic)
ROUTE	0.5 ml I.M.
BOOSTER	Not established but will likely be every 3 years while risk continues as protection from meningococcal disease requires circulating antibodies.
VACCINE TYPE	Recombinant protein
SIDE EFFECTS	Local: pain, redness, swelling Systemic: malaise, headache, myalgia[1]
EFFECTIVENESS	Bexsero is not expected to provide protection against all circulating meningococcal serogroup B strains. Provides 66 – 91% coverage against meningococcal serogroup B strains worldwide. (Predicted to provide 66 – 91% coverage against meningococcal serogroup B strains prevalent in Canada)
CONTRAINDICATED	Previous anaphylactic reaction to this vaccine
RESTRICTED TIME WITH OTHER VACCINES	None. In particular, may be used at any time with Meningococcal A,C,Y,W.
DELAY BLOOD DONATION	Unknown
METHOD OF CONTRACTION	Droplet
VACCINE COMPONENTS	Recombinant serogroup B proteins Aluminum Hydroxide\Sodium chloride, histidine, sucrose, kanamycin, water Latex in tip cap of syringe

[1] Other: Kawasaki Disease. At the time of approval, 7 cases were reported in phase 2 & 3 studies, 6 of which were vaccine recipients. This is higher than background levels, however no causal relationship has been determined

Health Canada approved 4CMenB (Multicomponent Meningococcal B Vaccine [recombinant, absorbed]) Schedule

DOSES AND SCHEDULE:
Infants 2 to 5 months of age: 3 doses given as 0.5 mL IM, given at least 4 weeks apart with a fourth dose after 12 months of age

Infants 6 to 11 months of age: 2 doses given as 0.5 mL IM, given at least 8 weeks apart, with a third dose after 12 months of age and at least 8 weeks after dose 2

Children 12 months to 10 years of age: 2 doses given as 0.5 mL IM, given at least 8 weeks apart

Individuals 11 years to 55 years of age: 2 doses given as 0.5 mL IM, given at least 4 weeks apart

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ADMINISTRATION: 0.5 mL IM (supplied as a 0.5 mL suspension in a pre-filled syringe)

Guidelines

The *Protocole d'immunisation du Quebec*[2] provides the following the recommendations on intervals between the dose of the same vaccines. Intervals between the doses of the same vaccine.

Intervals between the doses of the same vaccine[1]

Several vaccines require at least 2 doses in order to provide adequate protection, and a periodic booster is needed as well to maintain a high level of protection.

Unless otherwise indicated, when administering a primary immunization series, doses which are administered at lesser intervals than the minimal intervals recommended can lead to a sub-optimal immune response and should not be considered as given. Therefore, these doses will have to be re-administered according to the minimal or recommended interval initially scheduled, on the basis of the dose administered too early[2].
In general, it is not recommended to restart a primary immunization course that has been interrupted. It should be continued at the stage it was stopped, regardless of the elapsed time since last dose, even if the time interval is numbered in years. Such an approach is based on the presence of an immune memory that allows the body, n most cases, to respond rapidly and with great intensity to a booster dose, even if the prior dose was administered a very long time ago.

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[1]In cases where a minimal interval of one month is to be respected between the administration of two vaccine doses, such an interval generally corresponds to 4 weeks (28 days). When the dosing interval is specified in months, it is calculated according to calender months. For example, a person who is vaccinated on Febuary 1st and who requires a second 6 months later can receive the second dose as of August 1st.

[2]For instance, the third dose of the DTaP/IPV/Hib vaccine was administered as scheduled at 6 months of age, with a dose of DTaP-HB-IPV-Hib at 11 months of age, then the minimal interval was not respected, since only 5 months went by after the third dose, instead of the minimal interval of 6 months. The fourth dose is then considered invalid (with the exception of the HB component) and the DTaP/IPV/Hib vaccine must be given again within 6- to 12-month period (recommended minimal interval), or at least 17 months of age. This repeated dose would then be considered the fourth valid dose of primary immunization. The vaccination should then be carried out according to the recommended intervals.

Sorting out Meningococcal Vaccines

Meningococcal disease is a bacterial infection that causes meningitis (inflammation of the lining of the brain), septicemia (blood infection) and other infections (joint, ear etc.) This disease has a very rapid onset and people can become deathly ill in less than 24 hours. Death occurs in 10 – 40% of cases and other consequences are deafness, brain damage and amputations. The vaccines that protect against meningococcal disease do not provide long term immunity. The disease has such a short incubation period that circulating antibodies are required for protection. We cannot rely on immune memory as we can for diseases such as hepatitis A & B that have a long incubation period. Long incubation periods give the immune system time to produce protective antibodies. Meningococcal vaccines should be boosted every 3 -5 years if risk continues.

There are 5 sero-groups of the meningococcal bacteria that cause illness in North America: groups A, B, C, Y and W-135.

Conjugate C Vaccine: (Menjugate, Meningitec, Neis Vac-C)

In Canada, during the 2000's we had epidemics of group C disease. As a result every child in B.C. is given free meningococcal conjugate group C vaccine at 2 mos, 12 mos, and grade 6.

Conjugate A, C, Y, W-135 Vaccine: (Menactra, Menveo, Nimenrix)

As group C disease decreases due to vaccination, other groups such as group Y have become more prominent. The National Advisory Committee on Immunization recommends that all Canadian adolescents receive a dose of meningococcal conjugate vaccine around the age of 12 years. Ideally, this would be a vaccine containing A, C, Y, W-135. This vaccine is highly recommended for all college and university students up to 24 years.

Saudi Arabia and certain African countries have a high incidence of groups A and W-135 so the conjugate A,C,Y, W-135 is required or recommended for travellers to these areas.

This vaccine costs $130.00 /dose.

Meningococcal Group B Vaccine: (Bexsero)

Meningococcal group B accounts for between 1/3 to 2/3 of the cases of invasive meningococcal disease depending on where you live. In BC, group B accounts for more than1/3 of the cases of meningococcal disease. In Canada, 80% of cases occur in infants under 1 year. The high risk groups for meningococcal group B disease are 0 -1, 1-4 and 15 -24 years. There have been outbreaks of this disease in U.S. universities. Group B meningococcal disease is different from A, C, Y, W-135 in that there are 8000 strains of the group B organism that can cause disease. It is felt that Bexsero will protect against at least 2/3 of the group B meningococcal strains that occur in Canada.

This vaccine costs $125.00/dose.

2-4 doses of vaccine are needed for protection depending on the age at which vaccination is started. When starting at 11 years or older, 2 doses are needed at least 1 month apart.

Meningococcal group B vaccine is highly recommended for infants between 0-1 years as well as students attending U.S. universities

ANTIGEN ⇒	MEASLES, MUMPS, RUBELLA (M.M.R)
DOSAGE & INTERVAL	Adults[1] Children 1) 0.5 ml @ 12 mos. 2) 0.5 ml @ 4 – 6 years. Infants: from 6 mos. - ≤ 12 mos. if travelling , should receive one dose of vaccine. Two (2) additional doses should be given at routine times.
ROUTE	S.C.
BOOSTER	Lifetime immunity after 2 doses. Recommended interval is 12 weeks. However, if 4 weeks was the interval used, dose does not have to be repeated.
VACCINE TYPE	Live viral
STABILITY	Once mixed must be used within 8 hrs
EFFECTIVENESS	95 - 98%
ADEQUATE ANTIBODY LEVEL	10 - 14 days
SIDE EFFECTS	Local - redness and tenderness Systemic - possible fever 5 - 10 days after injection.
CONTRA-INDICATED	Pregnancy[2]. Okay for children of pregnant mother. Egg allergy is no longer a contraindication. Immunosuppressive conditions and therapy. History of anaphylactic reaction to previous vaccine containing MMR
RESTRICTED TIME WITH OTHER VACCINES	Give Y.F. on the same day or 4 weeks apart. Give M.M.R. 2 weeks before I.G. or 3 months after (or 6 weeks if pressed for time). PPD (TB Skin Test) same day or ≥ 4 weeks after MMR. Live vaccines can be given anytime after PPD (TB Skin Test).
DELAY BLOOD DONATION	4 weeks (new info as of April 2013 from Canadian Blood Services)
METHOD OF CONTRACTION	Droplets
VACCINE COMPONENTS:	No preservatives or adjuvant MMR II - Residual egg protein, neomycin sulphate, sorbitol gelatin. Priorix: Neomycin sulphate, lactose, amino acids, human albumin, mannitol, sortbitol

[1] Those born prior to 1970 are considered to have acquired natural immunity to measles and mumps.
For protection against:

- **measles:** 2 doses of a measles-containing vaccine are recommended for all individuals born on or after January 1, 1970 who do not have a history of lab confirmed measles disease or a documented second dose.
- **mumps**: 2 doses of a mumps-containing vaccine are recommended for all individuals born on or after January 1, 1970 (all children born in 1996 automatically got 2 doses of MMR vaccine);
- **rubella:** one dose is recommended for all individuals born on or after Jan 1, 1970.
- [2]Prevent pregnancy for one month following immunization.

ANTIGEN ⇒	MEASLES, MUMPS, RUBELLA, VARICELLA (M.M.R-V)
DOSAGE & INTERVAL	Adults[1] Children May be used off label for older children, adolescents and adults who require protection against all 4 components). **MMR-V is not recommended as a first dose in those ≤4 yrs due to an increased risk of febrile seizures** even though approved for 9 mos – 6 years (give as separate vaccines). 1) 0.5 ml @ 12 mos 2) 0.5 ml @ 4 – 6 years. Infants: from 6 mos. - ≤ 12 mos. if travelling , should receive one dose of MMR vaccine. Two (2) additional doses of MMR & cpox (varicella) should be given at routine times.
ROUTE	S.C.
BOOSTER	Lifetime immunity after 2 doses. Recommended interval is 12 weeks. However, if 4 weeks was the interval used, dose does not have to be repeated.
VACCINE TYPE	Live viral
STABILITY	Once mixed must be used within 8 hrs
EFFECTIVENESS	95 - 98%
ADEQUATE ANTIBODY LEVEL	10 - 14 days
SIDE EFFECTS	Local - redness and tenderness Systemic - possible fever 5 - 10 days after injection.
CONTRA-INDICATED	Pregnancy[2]. Okay for children of pregnant mother. Egg allergy is no longer a contraindication. Immunosuppressive conditions and therapy. History of anaphylactic reaction to previous vaccine containing MMR-V
RESTRICTED TIME WITH OTHER VACCINES	Give Y.F. on the same day or 4 weeks apart. Give M.M.R-V. 2 weeks before I.G. or 3 months after (or 6 weeks if pressed for time). PPD (TB Skin Test) same day or ≥ 4 weeks after MMR-V. Live vaccines can be given anytime after PPD (TB Skin Test).
DELAY BLOOD DONATION	4 weeks (new info as of April 2013 from Canadian Blood Services)
METHOD OF CONTRACTION	Droplets
VACCINE COMPONENTS: **(Priorix-Tetra)**	Residual egg protein, lactose, mannitol, neomycin sulphate, sorbitol

[1] Those born prior to 1970 are considered to have acquired natural immunity to measles and mumps. Majority of adults immune to varicella.
For protection against:

- **measles:** 2 doses of a measles-containing vaccine are recommended for all individuals born on or after January 1, 1970 who do not have a history of lab confirmed measles disease or a documented second dose.
- **mumps**: 2 doses of a mumps-containing vaccine are recommended for all individuals born on or after January 1, 1970 (all children born in 1996 automatically got 2 doses of MMR vaccine);
- **rubella:** one dose is recommended for all individuals born on or after Jan 1, 1970.
- [2]Prevent pregnancy for one month following immunization.

	PNEUMOCOCCAL- 13 (PREVNAR) Adult use only – see BCCDC Manual for pediatric use Streptococcus pneumoniae serotypes 1, 3, 4, 5, 6B, 7F, 9V, 14, 18C, 19A, 19F, 23F
DOSAGE & INTERVAL	Used routinely in infant vaccination program. Approved for use in high risk* individuals that are 50 years or over. May be used off-label for high risk individuals between 19-49 years. ACIP recommendations: 0.5 ml I.M., ideally Prevnar would be administered first and then pneumococcal-23 at least 8 weeks later. If pneumoccal-23 was administered first, 1 year should elapse prior to immunization with Prevnar.
ROUTE	0.5 ml I.M.
STABILITY	Single dose syringes
BOOSTER	Unknown
VACCINE TYPE	Conjugate polysaccharide (conjugated to Diphtheria CRM197 Protein)
EFFECTIVENESS	
ADEQUATE ANTIBODY LEVEL	
SIDE EFFECTS	Local redness and tenderness Rare: headache, fever, muscle and joint pain
CONTRAINDICATIONS	History of anaphylactic reaction to a previous dose of Prevnar and diphtheria toxoid
DELAYED BLOOD DONATION	2 weeks
METHOD OF CONTRACTION	Droplet
VACCINE COMPONENTS	Sodium chloride, Succinic acid, Polysorbate 80

*Conditions include: HIV infection, asplenia, diseases requiring treatment with immunosuppressive drugs or long-term steroids, radiation therapy, leukemia, lymphoma, Hodgkins disease, multiple myeloma, generalized malignancy, solid organ transplants, congenital or acquired immunodeficiency, CSF leaks and cochlear implants.

This vaccine is not provincially funded for adults with high risk conditions, with the exception of adults who are HSCT recipients and HIV positive.

ANTIGEN ⇒	POLIO (E/IPV)
DOSAGE & INTERVAL	Adults & Children ≥7 yrs 0.5 ml at 0-2-(8-14) months Children < 7 years See BC CDC Manual
ROUTE	S.C.
BOOSTER	Only one adult booster dose needed. This booster dose may be given as young as 15 years old.
VACCINE TYPE	Killed viral
EFFECTIVENESS	95 – 100%
ADEQUATE ANTIBODY LEVEL	Primary series - after 2 doses Booster - immediately
SIDE EFFECTS	Local tenderness
CONTRAINDICATED	History of previous anaphylactic reaction to polio vaccine
RESTRICTED TIME WITH OTHER VACCINES	None
DELAY BLOOD DONATION	2 days
METHOD OF CONTRACTION	Droplets, fecal-oral.
VACCINE COMPONENTS	2-phenoxyethanol (preservative) ≤ 0.02% formaldehyde (preservative) Other: albumin, bovine albumin, traces of polymycin B and neomycin

Exit Requirement

WHO has issued temporary polio vaccine exit recommendations[1] under the authority of the International Health Regulations (2005) for countries that are currently exporting cases of polio (Cameroon, Equatorial Guinea, Pakistan, and Syria) or that are polio infected but not currently exporting cases (Afghanistan, Ethiopia, Iraq, Israel, Somalia, and Nigeria); see each country's *Provider Summary* in Travax Destinations for details.

1. One dose of IPV or OPV at least 4 weeks and no more than one year before is required for departure for all travellers who have been in the country for more than 4 weeks and all residents.

Entry Requirement

Countries that do not have polio transmission may require travelers residing in and traveling from polio-infected countries to show proof of polio vaccination before they are allowed entry. The purpose of this requirement is to prevent viral shedding and spread into non-endemic countries.

- Countries that have non-IHR-based requirements for proof of polio vaccination prior to entry currently include Brunei, India, Iraq, Saudi Arabia, and Syria; see each country's *Provider summary* in Travax Destinations for details.

ANTIGEN ⇒	RABIES (IMOVAX)
DOSAGE & INTERVAL	Infants, children & Adults Pre-exposure (series: 3) 1 ml, I.M., day 0-7-(21 – 28)[1] 0.1 ml, I.D day 0,7 (21 – 28) (off-label use – saves money for travellers)[2] Post-exposure (series: 4) 1 ml, I.M. day 0-3-7-14 if no pre-exposure given, plus R.I.G. If pre-exposure given, give Rabies vaccine day 0 & 3
ROUTE	I.M. (Deltoid)
BOOSTER	Immunity considered lifetime. Test antibody titre if possible before giving booster to high risk groups (vets, lab workers). But still need 2 further doses of vaccine if exposed to rabies.
VACCINE TYPE	Human diploid cell (HDCV)
EFFECTIVENESS	100%
ADEQUATE ANTIBODY LEVEL	10 days after dose #3
SIDE EFFECTS	Local – tenderness Systemic - after booster, possible reactions: urticaria, pruritis, malaise
CONTRAINDICATED	No absolute contraindications Do not give I.D. dosage simultaneously with Chloro/Mefloquine.
RESTRICTED TIME WITH OTHER VACCINES	None.
DELAY BLOOD DONATION	Pre-exposure - 2 days Post-exposure - 1 year
METHOD OF CONTRACTION	Saliva, bite of rabid animal (dog, monkey, bat, etc.). Transmission also reported from aerosolized virus in bat infested caves.
VACCINE COMPONENTS	No adjuvants, no preservatives. Reconstituted vaccine must be used immediately. Other: human albumin, neomycin sulfate, phenol red, beta propiolactone

[1] Check serology if series differs from the usual 0, 7, 21-28

[2] May give 1 or more I.D. doses, give until bleb appears under skin, do serology 1 week after 3rd dose. Serology requires a 2 - 3 week turn around time! (Acceptable titre 0.5 I.U.)

ANTIGEN ⇒	RABIES (RABAVERT)
DOSAGE & INTERVAL	Infants, children & Adults Pre-exposure (series: 3) 1 ml, I.M., day 0-7-(21 – 28)[1] Post-exposure (series: 4) 1 ml, I.M. day 0-3-7-14 if no pre-exposure given, plus R.I.G. If pre-exposure given, give Rabies vaccine day 0 & 3
ROUTE	I.M. (Deltoid)
BOOSTER	Probably lifetime protection, Still need a further 2 doses on exposure. Test antibody titre if possible before giving booster.
VACCINE TYPE	PCECV purified chick embryo vaccine
EFFECTIVENESS	100%
ADEQUATE ANTIBODY LEVEL	10 days after dose #3
SIDE EFFECTS	Local redness, pain and tenderness, occasional itchiness. Less common are malaise, myalgia, headache and fever.
CONTRAINDICATED	History of hypersensitivity to the vaccine or its components, history of severe hypersensitivity reactions to egg or egg products.
RESTRICTED TIME WITH OTHER VACCINES	None.
DELAY BLOOD DONATION	Pre-exposure - 2 days Post-exposure - 1 year
METHOD OF CONTRACTION	Saliva, bite of rabid animal (dog, monkey, bat, etc.) Transmission also reported from aerosolized virus in bat infested caves.
VACCINE COMPONENTS	Human albumin, bovine gelatin, potassium glutamate, sodium EDTA, neomycin, chlortetracycline, amphotericin B.

[1] Check serology if series differs from the usual 0, 7, 21-28

ANTIGEN ⇒	TICK BORNE ENCEPHALITIS FSME – IMMUN (BAXTER)
DOSAGE & INTERVAL	(No longer available in Canada as of Mar. 2014) Adults ≥ 16 years 0.5 ml I.M. 0, 1-3 months after first dose, third dose 5-12 months after second dose. Accelerated schedule: First dose on day 0, second dose 14 days after first dose, third dose 6-15 months after second dose.
ROUTE	I.M. Deltoid
BOOSTER	Boost every 3 years after primary series and every 3 years for persons who remain at risk.
VACCINE TYPE	Inactivated Viral
EFFECTIVENESS	Seroconversion with normal schedule: 93-97% after second dose in adults Seroconversion with accelerated schedule: no data for adults
SIDE EFFECTS	Local redness and swelling at the injection site. Rare systemic reactions such as headaches, malaise, dizziness, anorexia, nausea, vomiting, and diarrhea. Very rare neurological reactions.
CONTRA-INDICATED	Individuals with prior anaphylactic reactions to eggs or egg products. Vaccine has been administered safely to > 100 persons with allergies to egg whites. History of anaphylactic reaction to a previous dose of this vaccine.
RESTRICTED TIME WITH OTHER VACCINES	None FSME – IMMUN and ENCEPUR (available in Europe) are considered to be interchangeable.
DELAY BLOOD DONATION	Probably 2 days
METHOD OF CONTRACTION	Tick bites. Consumption of unpasteurized dairy products from infected cows, sheep or goats.
STABILITY	Pre-loaded syringe
VACCINE COMPONENTS	Adjuvant - aluminum hydroxide, human albumin, thimerosal, and formaldehyde.

ANTIGEN ⇒	TRAVELLER'S DIARRHEA/CHOLERA (Dukoral))
DOSAGE & INTERVAL	2 Doses given at day 0, 7-42. Restart series if more than 6 weeks elapse between doses. No food or drink for 1 hour before and 1 hour after vaccine. May be used in 2 yrs or older (although it is unlikely that they'll take it)
ROUTE	Oral
BOOSTER	Protects against ETEC diarrhea for 3 months. Only 1 booster dose needed if given within 5 years of primary series or at a booster dose. Re-administer primary series if ≥ 5 years have elapsed.
VACCINE TYPE	Oral inactivated whole cell, contains cholera toxin B subunit.
EFFECTIVENESS	60% protection against ETEC. 85% protection against cholera
ADEQUATE ANTIBODY LEVEL	1 week after last dose.
SIDE EFFECTS	No serious adverse reactions. Rare – diarrhea, abdominal pain, nausea.
CONTRA-INDICATED	History of previous anaphylactic reaction to vaccine. Has not been assessed in pregnancy but should not pose a risk. (May be used in individuals who are allergic to raspberries)
RESTRICTED TIME WITH OTHER VACCINES	Separate from oral typhoid vaccine by 8 hours. No time restriction with antimalarials or antibiotics.
DELAY BLOOD DONATION	2 days
METHOD OF CONTRACTION	Contaminated food and water.
STABILITY	Store in fridge, room temperature for up to 2 weeks on one occasion only. After reconstitution use within 2 hours (buffer may be stored at room temperature).
VACCINE COMPONENTS	Sodium dihydrogen phosphate, disodium hydrogen phosphate. Buffer: sodium hydrogen carbonate, citric acid, sodium carbonate, saccharin sodium, sodium citrate, raspberry flavour. Gluten-free.

If protection against cholera is desired, adults and children > 6 years should get 2 doses with a single booster after 2 years. Children 2-6 years should get a primary series of 3 doses with a single booster after 6 months.

Resistance to Ciprofloxacin is reported in Cambodia, Laos, Thailand, Vietnam, India, Nepal and summertime in Mexico (June, July and August). Use Azithromycin[1] in travellers to these countries

NEJM, May 2, 2013 "Use of Azithromycin and death from cardiovascular causes"
"Cardiovascular risks with azithromycin and other antibacterial drugs"

These studies led Shoreland to conclude "Travellers who develop diarrhea should avoid azithromycin, other macrolide antibiotics and fluoroquinolones if they have cardiovascular disease."Cardiovascular disease is defined as: history of angina, previous MI, angioplasty, cardiac bypass, Q-T prolongation and arrythmias (antiarrythmic agents: quinidine, procainamide, disapyramide (Rhythmodan) dofetelide (Tikosyn), amiodarone (Cordarone), sotalol, dronedarone (Multaq), ibutilide (Covert).

Travellers with cardiovascular disease should be prescribed cefixime (Suprax) 200 mg BID for 3 days. Discontinue as soon as diarrhea stops. (Pediatric dose of Suprax is 8 mg/kg in one daily dose for 3 days. If >50 kg or >12 yrs use adult dose)

ANTIGEN ⇒	TYPHOID, INJ. (TYPHIM VI / TYPHERIX)
DOSAGE & INTERVAL	Adults & Children ≥ 2 yrs. 0.5 ml, (single dose)
ROUTE	I.M. Deltoid
BOOSTER	2 yrs.
VACCINE TYPE	Killed bacterial
EFFECTIVENESS	70%
ADEQUATE ANTIBODY LEVEL	15 days
SIDE EFFECTS	Local - pain, inflammation, or local induration, which resolves without problems.
CONTRAINDICATED	Age <2 years. History of anaphylactic reaction to previous dose of typhoid vaccine. Pregnancy: no studies, administer if benefits outweigh risks.
RESTRICTED TIME WITH OTHER VACCINES	None
DELAY BLOOD DONATION	2 days
METHOD OF CONTRACTION	Contaminated food and water
VACCINE COMPONENTS	Typhim Vi Adjuvant – none Preservative – 0.25% phenol Other: phenol, sodium chloride, sodium dibasic phosphate, sodium monobasic phosphate Typherix sodium chloride, sodium phosphate dihydrate, disodium phosphate, dihydrate, phenol

High risk countries endemic for typhoid are India, Pakistan, Bangladesh, Bhutan, Nepal and Sri Lanka.

Repeated doses of polysaccharide vaccines such as typhoid fever can result in a blunted immune response. For this reason, the Travel Clinic has decided to administer oral typhoid fever vaccine (if available) to travellers who have had 2 or more typhoid fever injections in the past ten years.

ANTIGEN ⇒	TYPHOID, ORAL
DOSAGE & INTERVAL	[1] Series: 4 capsules Adult & children: ≥ 6 yrs One capsule every other day with water one hour before meals. NPO 1 hr before and 1 hr after
ROUTE	Oral
BOOSTER	Repeat series every 4 years
VACCINE TYPE	Live bacterial
EFFECTIVENESS	70%
ADEQUATE ANTIBODY LEVEL	7 – 14 days after last dose
SIDE EFFECTS	Possible nausea, abdominal cramps, vomiting, rash, headache
CONTRAINDICATED	Age < 6 yrs, immunosuppressed, acute GI illness or chronic inflammatory bowel disease. History of previous anaphylactic reaction to typhoid vaccine. Avoid vaccinating during pregnancy (but may be safely administered to breast feeding women) or acute febrile illness.
RESTRICTED TIME WITH OTHER VACCINES	From Shoreland: Per CDC, mefloquine and chloroquine can be given concurrently with the oral typhoid vaccine, and atovaquone/proganil (Malarone), at prophylaxis doses, can be given concurrently with the oral typhoid vaccine. Ideally, however, the oral typhoid vaccine should be completed 14 days before travel, limiting the need to administer concurrently with atovaquone/proguanil. Per WHO, **proguanil** and **mefloquine** should be stopped from 3 days before until 3 days after giving oral typhoid vaccine. Per AAP, chloroquine can be given simultaneously with oral typhoid vaccine; oral typhoid vaccine should be given 24 hours before or after administration of mefloquine. Proguanil should be given ≥ 10 days after the fourth dose of oral typhoid vaccine. Published data are not available for the spacing of other antimalarials. See below for Shoreland's recommendations on the spacing of oral typhoid vaccine with anti-bacterial drugs (including **doxycycline**, which may also be used as an an antimalarial).

	Antibiotics and Sulfonamides Based on the advice and clinical practice of experienced travel medicine clinicians, Shoreland advises that **anti-bacterial drugs** should be avoided for 7 days *before the first dose* of oral typhoid vaccine and for 7 days *after the fourth dose* (*see above for antimalarial exceptions*) • Persons needing to take an antibiotic for an infection who are in the midst of the 4-dose oral typhoid series should restart the oral typhoid series 7 days after the last does of antibiotic. If there is insufficient time prior to departure to complete the series of oral typhoid vaccine, a single dose of injectable Vi polysaccharide vaccine can be administered. Per CDC, vaccination with oral typhoid vaccine should be delayed for >72 hours after administering sulfonamides or any antibiotic including **doxycycline**. Shoreland advises that 24 hours may be adequate for short, half-life antibiotics including doxycycline but may not be adequate for longer acting preparations such as **azithromycin.** Per AAP, antimicrobial agents should be avoided for at least 24 hours before the first dose of oral typhoid vaccine and for 7 days after the fourth dose. Per WHO, antibiotics should be stopped from 3 days before until 3 days after giving oral typhoid vaccine. Separate 8 hours from Dukoral. No time restriction with live viral vaccines.
DELAY BLOOD DONATION	1 week
METHOD OF CONTRACTION	Contaminated food and water
STABILITY	Keep refrigerated. Can be out of fridge for 7 days (once only)
VACCINE COMPONENTS	No adjuvants or preservatives Other: sodium bicarbonate, ascorbic acid, lactose, sucrose, aspartame, amino acids

[1] Acceptable schedules: Completing the series within 10 days, with at least 48 hrs between each dose or a maximum of 3 skipped days between each dose. Taking doses 2 days in a row **IS NOT** acceptable.

[2] Malarone may be given concurrently with oral typhoid vaccine because the dose of proquanil is only 100 mg/day not the 200 mg/day when proquanil is used on its own.

Repeated doses of polysaccharide vaccines such as typhoid fever can result in a blunted immune response. For this reason, the Travel Clinic has decided to administer oral typhoid fever vaccine to travellers who have had 2 or more typhoid fever injections in the past ten years. In this situation oral typhoid vaccine may be used if there is enough time to complete all oral doses prior to departure.

ANTIGEN ⇒	VIVAXIM (Hepatitis A / Typhoid Fever) (Avaxim & Typhim Vi)
DOSAGE & INTERVAL	Licensed for 16 years and up, okay to use in ≥ 12 yrs. May be used in ≥ 2 years if needed. Avaxim – 2 doses, 6 – 12 months apart Typhim Vi – 1 dose protects for 2 years
ROUTE	I.M. deltoid
BOOSTER	Avaxim – 2 doses, 6 – 12 months apart Typhim Vi – 2 years
VACCINE TYPE	Avaxim – inactivated viral Typhim Vi – killed bacterial
STABILITY	Use immediately, once the 2 chambers have been mixed together.
EFFECTIVENESS	Avaxim – Day 19 100% seroconvert Typhim Vi – Day 14 86.49% ≥ 4 fold rise in antibody titres
ADEQUATE ANTIBODY LEVEL	Avaxim – 100% Typhim Vi – Studies show efficacy to be between 50-70%
SIDE EFFECTS	Local – pain and redness Systemic – headache, nausea, diarrhea, muscle aches
CONTRAINDICATED	Pregnancy – relative contraindication, no studies done, administer if benefits outweigh risks Not approved for under 16 years of age (but dose of Avaxim & Typhoid is the same as that given separately so ok to give in 12-16 year olds and even in 2 years and older if necessary. *Suni Boraston) Defer vaccine in presence of any acute illness
RESTRICTED TIME WITH OTHER VACCINES	Concomitant administration of IG may result in lower anti HAV than when vaccine given alone
DELAY BLOOD DONATION	2 days
METHOD OF CONTRACTION	Contaminated food and water
VACCINE COMPONENTS	Disodium phosphate dehydrate, 2-phenoxyethanol, formaldehyde, aluminum hydroxide, neomycin

Repeated doses of polysaccharide vaccines such as typhoid fever may result in a blunted immune response. For this reason, the Travel Clinic has decided to administer oral typhoid fever vaccine to travellers who have had 2 or more typhoid fever injections in the past ten years.

*May be used in ≥ 2 yrs when typhoid injectable is not available.

TYPHOID FEVER VACCINE
(Excerpted from CCDR, Feb 20, 2014)

Typhoid fever is a bacterial disease caused by Salmonella enterica typhi. It is acquired by consumption of contaminated water or food.

Typhoid fever starts as a gradually increasing fatigue and a fever that gets slightly higher every day. Headache, feeling ill and loss of appetite always occur. The very rare serious complications of typhoid fever occur after 2 -3 weeks of illness and include intestinal hemorrhage and perforation. Typhoid fever can be treated with antibiotics.

Both oral and injectable typhoid fever vaccines are very safe. Adverse events are mild and not significantly different from controls for: fever, vomiting, diarrhea, headaches, rash or erythema. For injectable vaccine, pain at the injection site was more common and for enteric coated oral typhoid fever vaccine nausea and abdominal pain were most commonly reported.

The risk of contracting typhoid fever in various destinations is:

Indian Subcontinent*	33/100,000
Caribbean & Central America	0.3/100,000
South America	.5-1.0/100,000
Southeast Asia & East Asia (China)	0.55/100,000 (verbal communication with: Michael Liebman as discussed at CATMAT)
North Africa, Middle East and Sub-Saharan Africa	.5-1.0/100,000

*India, Pakistan, Bangladesh, Nepal, Sri Lanka, Afghanistan, Bhutan, Maldives

All travellers for any length of time to the Indian subcontinent should be vaccinated against typhoid fever.

Consider typhoid fever vaccine for travel outside of Indian Subcontinent if:

- travel is for 4 weeks or more
- travellers are visiting friends and relatives
- travellers are asplenic (functional or anatomic)
- travellers have achlorhydria or use acid suppression therapy
- travellers desire vaccine

ANTIGEN ⇒	YELLOW FEVER
DOSAGE & INTERVAL	Single dose Adults & Children ≥ 9 mos. 0.5 ml Give to ages >60 yrs. for travel to high risk areas only.
ROUTE	S.C.
BOOSTER	In May 2013, WHO announced YF vaccine provides lifetime protection. In June 2013, PHAC announced the same. Until the International Health Regulations (IHR) officially recognize this change and it is acknowledged by all countries, a booster dose of YF vaccine should be given every 10 years to those going to countries where vaccine is required. A waiver certificate is not appropriate for those who have been vaccinated in the past but need a 10 year booster. This contravenes the IHR. Fortunately, those people who have been previously vaccinated are not at high risk of severe adverse events. For those who have had a previous dose of YF vaccine and are going to countries where YF is recommended but not required, the lifetime protection offered by a previous documented dose means a further booster dose is not needed.
STABILITY	Once reconstituted must be used within 1 hour.
VACCINE TYPE	Live viral
EFFECTIVENESS	100%
ADEQUATE ANTIBODY LEVEL	10 days
SIDE EFFECTS	A few days after vaccination, 10 -30 % report mild systemic events: low grade fever , headaches, myalgias that begin days after vaccination and last 5 – 10 days. 1% of vaccinees curtail regular activities because of these reactions.
CONTRAINDICATED	Severe egg allergy, history of anaphylactic reaction to Yellow Fever vaccine, immunosuppressed[1], infant < 9 months, history of thymoma or other thymus disorders. Pregnancy, breastfeeding and multiple sclerosis [2] are relative contraindications. Severe reactions following yellow fever vaccine increases with age. Risk between 60-69 years old is 4.4/100,000 doses and ≥ 70 years old is 6.4/100,000 doses. These serious reactions include *YEL-AVD: Multi organ failure and **YEL-AND: Post vaccine encephalitis, Guillain-Barre syndrome, autoimmune central or peripheral nervous system involvement.
RESTRICTED TIME WITH OTHER VACCINES	Give Varivax, M.M.R., and/or BCG, on the same day or 4 weeks apart. PPD same day or ≥ 4 weeks after live vaccine. Live vaccines can be given any time after PPD. No time restriction between YF vaccine, oral cholera, oral typhoid fever and live influenza vaccines.
DELAY BLOOD DONATION	4 weeks
METHOD OF CONTRACTION	Mosquito bite - daytime biter.
VACCINE COMPONENTS	No adjuvants, no preservatives Contains residual egg proteins, sorbitol, gelatin, sodium chloride Stopper contains latex – when administering to a latex allergic individual either remove stopper or use separate needles for drawing up and administering.

* YEL-AVD: Yellow Fever Vaccine Associated Viscerotropic disease.
** YEL-AND: Yellow Fever Vaccine Associated Neurotropic disease.
[1] TNF blockers and methotrexate must be discontinued for 3 months prior to administering YF vaccine. Steroids must be discontinued 1 mos. prior to administering YF vaccine.
[2] Farez MF, Correale J. YELLOW FEVER VACCINATION AND INCREASED RELAPSE RATE IN TRAVELLERS WITH MULTIPLE SCLEROSIS. Arch Neurol. Published on-line June 13, 2011.
Conclusion: "Immunization with YF vaccine increases the risk of relapse in patients with multiple sclerosis (MS) more than 10-fold. For patients with MS travelling to YF endemic areas, vaccination against YF should be recommended only after carefully weighing the risk of acquiring YF against the risk of exacerbation of MS"

	HERPES ZOSTER VACCINE (ZOSTAVAX - II)
DOSAGE & INTERVAL	Adults 50 years and older – one dose If Zostavax is requested by people under 50 it may be given, just inform them that we don't know how long the immunity lasts and another dose may be recommended at some point. Do not question people over 50 about a history of chicken pox, simply administer Zostavax.
ROUTE	Subcutaneous
BOOSTER	At least 7 years. No booster vaccine recommended as of Dec. 2014.
STABILITY	Store at 2 – 8 ^{0} C. Use reconstituted vaccine within 30 minutes.
VACCINE TYPE	Live, attenuated virus
EFFECTIVENESS	In subjects 60 years or older, reduction in the incidence of herpes zoster was 51%. Efficacy in preventing post herpetic neuralgia 66%
ADEQUATE ANTIBODY LEVEL	1 – 3 weeks following vaccination
SIDE EFFECTS	Pain, redness and swelling at injection site, headache
CONTRA-INDICATED	Immunesuppressed individuals[1], pregnancy, active, untreated tuberculosis, history of anaphylaxis to gelatin and neomycin. Consider deferring vaccination in presence of fever. Avoid pregnancy for 3 months after vaccination. Corticosteroids >20 mg/day for 2 or more weeks.
RESTRICTED TIME WITH OTHER VACCINES/DRUGS	Separate administration of Zostavax and other live vaccines by 4 weeks OR give concurrently. No time restrictions with flu vaccine and pneumococcal vaccine. Do TB skin testing on same day or delay TB testing for > 4 weeks. Individuals who inadvertently receive systemic anti-viral therapy active against VZV (acyclovir) within 2 days before and 14 days after Zostavax injection may benefit from a second dose of vaccine 42 days or later and after discontinuing antiviral therapy. "ZOSTAVAX may be administered at any time before, at the same time as, or after administration of any blood product, including antibody-containing products." Zostavax should be given 10 – 14 days prior to the initiation of cancer chemotherapy or three months after chemo has ended. CCABC recommendations are 6 months after chemo for lymphoid cancer. CCABC frequently recommends vaccine 7 days prior to the initiation of chemotherapy. Zostavax may be given after an episode of shingles but wait until the lesions heal. As of Jan. 2014, experts recommend waiting one year after shingles episode to administer Zostavax (NAC1 statement, Jan. 2014). Cases of recurrent Herpes Zoster Ophthalmicus (HZO) have been reported after administration of herpes zoster vaccine in individuals who have had a previous case of HZO. Causality has not been proven but individuals who have had HZO should discuss the merits of vaccination with their ophthalmologist prior to being vaccinated. It is important to ascertain that active HZO is not present. Herpes zoster vaccine should not be given to persons with active HZO.

BECAME AVAILABLE JUNE 2014

DELAY BLOOD DONATION	90 days as per Canadian Blood Services
METHOD OF CONTRACTION	Herpes zoster (shingles) is a reactivation of varicella zoster or chicken pox.
VACCINE COMPONENTS	Sucrose, gelatin, sodium chloride, monosodium L-glutamate monohydrate, sodium phosphate dibasic, potassium phosphate monobasic, potassium chloride, neomycin, bovine calf serum, urea. Does not contain latex.

Ok to give to: Methotrexate ≤ 0.4 mg/Kg/week (≤ 25 mg/week for adults)
Azathioprine≤ 3.0 mg/Kg/day
6- mercaptopurine≤ 1.5 mg/Kg/day
Prednisone ≤ 20 mg/day
Leflunomide (Arava) any dose is safe but teriflunomide is immunosuppressive and Zostavax should be administered at least 7 days prior to onset of therapy.
Anti TNF drugs- administer vaccine at least one month after cessation of therapy, although there is some preliminary data showing that Zostavax may be safely administered in patients taking anti-TNF antibodies (Infliximab, Adalimumab) and TNF receptor blockers (Etanercept). (See NACI statement).
No data on patients taking non-TNF blockers (Abatacept, Rituximab).

[1]- persons with leukemia, lymphoma, or malignant neoplasms affecting the bone marrow or lymphatic system. But CCABC recommends Zostavax for patients with lymphoma, Hodgkins Lymphoma, myeloma and leukemia if vaccine can be given 2 weeks before initiation of anti-lymphoid cancer treatment or 6 months after completion of all lymphoid cancer treatment and any other immunosuppressive treatments. All stem cell and bone marrow transplant recipients must wait 2 years after that procedure before being vaccinated with Zostavax.

- persons with AIDS or other clinical manifestations of HIV, including persons with CD4+ T-lymphocyte values of ≤ 200 per mm^3
- persons on immunosuppressive therapy, including high-dose cortosteroids (≥ 20 mg/day) lasting 2 or more weeks. Defer vaccination for at least 1 month after discontinuation of such therapy

ONLY PRODUCTS USED AT THE TRAVEL CLINIC ARE LISTED.
VACCINES THAT MAY CONTAIN:

VACCINE	THIMEROSAL	EGG (Residual Egg Protein	LATEX
Cholera/Traveller's Diarrhea (Dukoral-Sanofi Pasteur)	No	No	No
DPTPO (Quadracel-SP) + (Infanrix-Polio-GSK)	No	No	No
DPTP+HIB (Pediacel-Sanofi Pasteur)	No	No	No
Hepatitis A (Avaxim-Sanofi Pasteur)	No	No	No
Hepatitis A (Vaqta-Merck)	No	No	Yes
Hepatitis A/Typhoid (Vivaxim-Sanofi Pasteur)	No	No	No
Hepatitis A (Havrix-GSK) (1440 + 720)	No	No	No
Hepatitis B (Recombivax-Merck) single dose Ped & Adult	No	No	Yes
Hepatitis B (Recombivax-Merck) multi dose (Adult)	Yes	No	Yes
Hepatitis B (Engerix-GSK – single dose)	No	No	No
HIB (Act-HIB) (Sanofi Pasteur)	No	No	No
HPV + HPV (9) (Gardasil-Merck)	No	No	No
Influenza (Vaxigrip-Sanofi Pasteur) (Fluviral-Glaxo Smith Kline)	.0004% .019%	Yes Yes	No No
Japanese Encephalitis (Ixiaro-Novartis)	No	No	
Japanese Encephalitis (JE-VAX –Sanofi Pasteur)	Yes	No	No
Meningococcal Conjugate C (GSK)	No	No	No
Meningococcal B 4C MenB (Bexsero-Novartis)	No	No	yes
Meningococcal Meningitis Conjugate A-C-Y-W 135 (Menveo – Novartis)	No	No	No
Meningococcal Meningitis Polysaccharide A-C-Y-W 135 (Menomune – Sanofi Pasteur)	Yes	No	Yes
Meningococcal Meningitis Conjugate A-C-Y-W 135 (Menactra – Sanofi Pasteur)	No	No	Yes
MMR (SP & GSK)	No	Yes	No
MMR-V (GSK)	No	Yes	No
Pneumococcal-7 (Prevnar - Wyeth)	No	No	No
Pneumococcal-13 (Prevnar - Pfizer)	No	No	No
Pneumococcal – 23 (Sanofi Pasteur)	No	No	No
Polio (E/IPV) (Sanofi Pasteur)	No	No	No
Rabies (Imovax & Rabavert)	No	No	No
Td Pertussis - TdaP (Adacel – SP) + (Boostrix – GSK)	No	No	No
Td (Vials – Sanofi Pasteur)	No	No	No
TdPolio (TdP – Sanofi Pasteur)	No	No	No
Typhoid (SP & GSK)	No	No	No
Twinrix (GSK)	No	No	No
Varicella (GSK)	No	No	No

VACCINE	THIMEROSAL	EGG (Residual Egg Protein	LATEX
Yellow Fever (Sanofi Pasteur)	No	Yes	Yes
Zostavax II (Merck)	No	No	No

MALARIA PREVENTION PROTOCOL

REGION	DRUGS OF CHOICE	ALTERNATIVES	STAND-BY TREATMENT (ONLY IF INDICATED)
Chloroquine sensitive	Chloroquine	Doxycycline, Malarone, Primaquine	Chloroquine if no prophylaxis taken. If taking chloroquine prophylaxis Malarone
Chloroquine resistant	Doxycycline, Malarone	Primaquine Mefloquine Chloroquine plus Proguanil	Malarone Quinine and Doxycycline
Chloroquine and Mefloquine resistant	Doxycycline, Malarone	Primaquine	Malarone

"For travel of four weeks or more to highly endemic *P. falciparum* areas of Africa, consider using Malarone three times per week if daily Malarone is too expensive and there are objections to daily doxycycline. The dose is one tablet three times per week, ideally on Monday, Wednesday and Friday (easy to remember but Malarone should start 24 hours before arrival in the malarious area). There is a good Israeli study (on next page) showing that Malarone can be taken twice weekly but the places that have actually implemented this (Uganda) are using three times weekly Malarone as a safety margin in the case of missed doses. Please make a note of whom you prescribe this to and give it to Suni or Eliza. We plan to follow up to see how these people did on a decreased Malarone regimen."

Countries For Which Thrice Weekly Malarone May be Considered:

Southern Mauritania, Senegal, Guinea-Bissau, Guinea, Sierra Leone, Liberia, Cote d'Ivoire, Ghana, Togo, Benin, Nigeria, Cameroon, Equatorial Guinea, Gabon, Democratic Republic of the Congo, Republic of the Congo, Central African Republic, South Sudan, Southern Mali, Burkina Faso, Southern Niger, Southern Chad, Eritrea, Ethiopia, Somalia, Uganda, Kenya, Tanzania, Malawi, Mozambique, Zambia, Angola, Madagascar, parts of Zimbabwe, Northern Namibia, Northern Botswana, Krueger Park.

Effectiveness of Twice a Week Prophylaxis with Atovaquone-proguanil in Long-term Travelers to Sub-Saharan Africa

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Background: Current guidelines recommend daily dosing of atovaquone-proguanil (AP), beginning a day before travel to an endemic area and continuing for 7 days after departure. Adherence of long-term travelers to a daily malaria chemoprophylaxis tends to be poor, even when residing in highly endemic regions for malaria. Evidence from a volunteer challenging study, suggests that even a once weekly dosing of AP provides effective malaria protection against *Plasmodium falciparum.*
Objective: Assessing the effectiveness of twice weekly AP prophylaxis in long-term travelers to highly endemic *Plasmodium falciparum* areas in West Africa.
Methods: To detect prophylactic failures associated with twice weekly AP, we conducted a retrospective surveillance during the years 2013 – 2014 among long-term expatriates in 2 sites in sub-Saharan West Africa. Living conditions were similar in each site. The expatriates were divided according to the malaria prophylaxis regimen they took: the AP twice weekly group; the mefloquine once weekly group and the group of expatriates taking no prophylaxis. Malaria events were recorded for each group. The incidence density of malaria was calculated by dividing malaria events per number of patient/months at risk. A logistic regression model was designed to control for possible confounders.
Results: There were 127 travelers to sub-Saharan Africa in this surveillance. The malaria rates were: 11.7/1000 person- months in the group with no prophylaxis (13 episodes per 1112 months are risk, N=61); 2.5/1000 person months in the mefloquine group (2 episodes per 812 months at risk, N=38, p=0.02) and no cases of malaria (0 episodes per 285 person-months, N=28, p=0.05) in the twice weekly AP group.
Conclusions: No prophylaxis failures were detected among the group of travelers who took AP prophylaxis twice a week, while among the group without prophylaxis malaria incidence was 11.7/1000 person-months. We recommend further validation of our findings by clinical trials, prospective studies, and active surveillance in larger cohorts to assess the effectiveness of twice weekly AP prophylaxis in travelers.

DRUG DOSAGE FOR PROPHYLAXIS

DRUG	TABLET SIZE	ADULT DOSE	PAEDIATRIC DOSE	COMMENTS
CHLOROQUINE PHOSPHATE	250 MG (SALT)	500 MG ONCE WEEKLY OR 8.3 MG/KG WEEKLY FOR ADULTS >70 KG	8.3 MG/KG WEEKLY AGE WGT DOSE <1 YR <10KG 62.5 - 125MG 1-4 YR 10-19 125 MG 5-8 YR 20-30 250MG 9-15YR 31-45 375MG >15YR >45 500MG	-WEEKLY DOSE MAY BE TAKEN AS 1/2 DOSE TWICE WEEKLY IF GASTRIC UPSET IS A PROBLEM -START 1 WEEK BEFORE, CONTINUE 4 WEEKS AFTER.
PROGUANIL	100 MG	200 MG ONCE EACH DAY	AGE WT. DOSE <1YR<10KG 25MG/DAY 1-4 YR 10-19KG 50MG/DAY 5-8 YR 20-30 KG 75MG/DAY 9-12 YR 31-40KG 100MG/DAY >12 >40KG 200MG/DAY	-START 2 DAYS BEFORE ENTERING AREA AND CONTINUE FOR 4 WEEKS AFTER DEPARTING AREA
DOXYCYCLINE	100 MG	100 MG ONCE EACH DAY	<8 YRS - NOT RECOMMENDED >8 YRS - 2 MG/KG ONCE/DAY	-START 2 DAYS BEFORE ENTERING AREA AND CONTINUE FOR 4 WEEKS AFTER DEPARTING AREA.
MEFLOQUINE	250 MG	250 MG ONCE WEEKLY	PEDIATRIC 5 MG/KG/WK 4-14KG 1/10-1/4 TAB/WK. 15-19KG: 1/4 TAB/WK 20-30KG: 1/2 TAB/WK 31-45KG: 3/4 TAB/WK >45KG: 1 TAB/WK	-BEGIN 1 WEEK BEFORE ARRIVAL IN AREA AND CONTINUE FOR 4 WEEKS AFTER DEPARTURE.

*DRUG DOSAGE FOR STAND-BY TREATMENT

DRUG	TABLET SIZE	ADULT DOSE	PAEDIATRIC DOSE
CHLOROQUINE PHOSPHATE	250MG (SALT)	1 GRAM IMMEDIATELY ON DAY 1 AND AGAIN ON DAY 2 AND 500 MG IN 8 HOURS	16.5 MG/KG ON DAY 1 AND AGAIN ON DAY 2 AND 8.3 MG/KG IN 8 HOURS
MALARONE ATOVAQUONE/ PROGUANIL	ATOVAQUONE (250 MG) AND PROGUANIL (100 MG)	4 TABLETS ONCE DAILY X 3 DAYS	20MG/KG ATOVAQUONE AND 8MG/KG PROGUANIL ONCE DAILY X 3 DAYS 11-20 KG: 1 TABLET DAILY 21-30 KG: 2 TABLETS DAILY 31-40 KG: 3 TABLETS DAILY ≥ 41 KG: 4 TABLETS DAILY
NOVOQUININE* QUININE SULPHATE AND	250MG BASE	2 TABLETS 3 TIMES DAILY FOR 3 - 7 DAYS	7.5 BASE/KG (MAX 500MG BASE) 3 TIMES DAILY FOR 3 - 7 DAYS
DOXYCYCLINE*	100 MG TABLETS	1 TABLET TWICE DAILY FOR 7 DAYS	1.5 MG BASE/KG TWICE DAILY (MAX. 200MG DAILY) <25 KG OR <8 YR CONTRAINDICATED 25-35 KG OR 8-10 YR: 50 MG TWICE DAILY 35-60 KG OR 11-13: 75MG TWICE DAILY ≥51 KG OR ≥14 YR: 100 MG TWICE DAILY.

DRUG	TABLET SIZE	ADULT DOSE	PAEDIATRIC DOSE	COMMENTS
MALARONE	Atovaquone 250mg And Proguanil 100mg	One tablet daily	Pediatric Dose Wgt Dose 11-20 kg: 62.5mg/25mg 21-30 kg: 125mg/50mg 31-40 kg: 187.5mg/75mg > 40kg: 250mg/100mg	1 day before and 3 days after departure.
PRIMAQUINE	15mg base= 26.3 mg salt	2 tablets daily	Pediatric Dose: 0.5 mg base / kg / day	2 tablets daily 1 day before and 1 week after **MUST DO G6PD SCREEN FIRST**!

DRUG	TABLET SIZE	ADULT DOSE	PAEDIATRIC DOSE

HALOFANTRINE IS USED BY SOME COUNTRIES AS A STANDBY TREATMENT. IT HAS ADVERSE CARDIAC EFFECTS AND IS NO LONGER RECOMMENDED

MEFLOQUINE AND FANSIMEF ARE NOT RECOMMENDED AS STAND BY TREATMENT

* QUININE AND DOXYCYCLINE MUST BE TAKEN TOGETHER

Presumptive anti-relapse therapy (PART) [1]

PRIMAQUINE	15mg base	2 tablets daily X 14 days	0.5 mg base / kg / day	2 tablets daily X 14 days on departure of malarious areas **MUST DO G6PD SCREEN FIRST**!

[1]. Indicated for people who will have prolonged exposure to P. Vivax, P. Ovale or both. (4 weeks or longer) The Travel Clinic recommends that PART be considered for travel to Papa New Guinea. When chloroquine, doxycycline or mefloquine is used for primary prophylaxis, primaquine is usually taken during the first 2 weeks of post-exposure prophylaxis (i.e. on departure from malarious area). When Malarone is used for prophylaxis, primaquine may be started during the final 2 weeks of Malarone prophylaxis or on departure from the malarious area. Alternatively, primaquine may be administered after the primary prophylaxis medication has been completed. Primary prophylaxis with primaquine obviates the need for PART (CDC Health Information for International Travel 2012)

HIV POST-EXPOSURE PROPHYLAXIS FOR TRAVELLERS PROVIDING HEALTH CARE OVERSEAS

Travel Clinics should be recommending and prescribing HIV post-exposure prophylaxis (PEP) to health care workers who are going to developing countries to provide health care.

An exposure that might place a health care provider at risk for HIV infection is a needle stick, cut with a sharp object, contact of mucous membrane or non-intact skin (chapped, abraded, dermatitis) with blood, tissue or other body fluids that are potentially infectious.

- The risk of seroconversion after a single percutaneous exposure is between 0.3-4.2 %. The risk is higher if there was visible blood in the needle, a large bore needle and a terminally ill source patient.

Post exposure prophylaxis with antiretroviral medications has been shown to decrease the risk of seroconversion by about 81% and is indicated in instances involving a percutaneous exposure to infectious blood or body fluids from an HIV-infected individual. In areas such as sub-Saharan Africa, where seroprevalence in certain cities can be over 25% of the adult population, post-exposure prophylaxis should be considered for any percutaneous exposure even when the serologic status of the source patient is unknown.

Current recommendations are to use a 2-3-drug regimen that includes zidovudine. Therapy should begin as soon as possible after exposure, ideally within 24 hours. Persons receiving PEP should complete a 4-week regimen.

PEP with these drugs should begin immediately upon exposure:

Preferred Option:

Truveda (200 mg emtricitabine + 300 mg tenovir) 1 tablet per day
+
Raltegravir (400 mg. 1 tablet twice per day)

Cost is approximately $500 per week

Truveda alone may be used for low risk exposure

All exposed HCW's should seek medical attention by an experienced infectious disease practitioner in order to have an accurate assessment of risk and the need for continuation of the prophylactic regime. In general this will mean a return home so usually one week of PEP is usually all that need be prescribed for these HCW's to carry with them.

Travelling health care workers should not rely on the use of antiretrovirals used in developing countries as these may be older, less expensive drugs not suitable for PEP.

Available at:

Shopper's Drug Mart
(Thurlow & Davie)
604-669-2424

3.1 Minimum Intervals between Vaccine Doses Table

Use "minimum intervals" when a child or adolescent starts an immunization series at a later date, or falls behind the routine immunization schedule **by one month** or more. **When the client is up-to-date for age, return to the routine age-appropriate schedule. NOTE**: Refer to 1.3 HIB Schedule When The Basic Schedule Has Been Delayed for minimum intervals for a three dose primary Hib series.

Vaccine (Dose 1 minimum age)	**Minimum Spacing Between Doses❶**			
	Dose 1 to Dose 2	**Dose 2 to Dose 3**	**Dose 3 to Dose 4**	**Dose 4 to Dose 5**
DTaP-IPV-Hib (6 weeks)	4 weeks	4 weeks	24 weeks ❷	24 weeks AND minimum age for this dose is 4 years ❸
DTaP-HB-IPV-Hib INFANRIX hexa® (6 weeks)	4 weeks	16 weeks after dose 1 AND 8 weeks after dose 2 AND minimum age for dose 3 is 24 weeks		
Pneumococcal conjugate **4 doses** (6 weeks) ❹	4 weeks	4 weeks	8 weeks ❺	
Pneumococcal conjugate **3 doses** (8 weeks) ❹	4 weeks	8 weeks ❺		
Meningococcal C conjugate NeisVac-C (8 weeks)	8 weeks ❻			
MMR (12 months) ❼	4 weeks			
MMRV (4 years)	12 weeks			
Rotavirus (6 weeks) ❽	4 weeks ❽			
Varicella (12 months)	12 weeks or 6 weeks ❾			
Td (7 years)	4 weeks	24 weeks	10 years	
HPV-quadrivalent Gardasil® **3 doses** (9 years)	4 weeks	12 weeks after dose 2 and 24 weeks after dose 1		
HPV-quadrivalent Gardasil® **2 doses** (9 years)❿	5 months (or 150 days)			
HPV-bivalent Cervarix® (9 years)	4 weeks	12 weeks after dose 2 AND 20 weeks after dose 1		
Hepatitis A (24 weeks)	24 weeks			

❶ Minimum intervals are calculated in weeks up to 12 months and then calculated in years.

❷ If DTaP-IPV-Hib 4th dose is given before 15 months of age, another dose of Hib is required, at 15 months of age. ❸ Minimum age for dose 5 is 4 years.

❹ When a series of pneumococcal conjugate vaccine is delayed or interrupted, refer to BC Communicable Disease Manual, Chapter 2, Section VII, Biological Products.

❺The final dose of Pneumococcal conjugate vaccine in a three or four dose series should be given no sooner than 12 months of age, and at least 8 weeks after the previous dose.

❻ For healthy infants, administer second dose of NeisVac-C vaccine on or after 12 months of age and at least eight weeks after the previous dose. High risk infants receive a second dose 8 weeks after dose 1, followed by a dose on or after 12 months of age and at least 8 weeks after the previous dose.

❼ A dose may be given as early as 6 months of age in infants who are travelling to endemic areas or who are identified as contacts of a measles case. If MMR is given before 12 months of age, the child will require two doses of MMR after 12 months of age.

❽ The **maximum** age for dose 1 is 20 weeks less 1 day. The maximum age for the second dose is 8 months less 1 day of age.

❾ For those ≤ 12 years of age the recommended interval between two doses of varicella is 12 weeks; this is also the minimum interval to be used when scheduling a second dose. However, if an interval as short as 4 weeks was used, the dose does not need to be repeated. For those ≥ 13 years of age the recommended interval between two doses of varicella is 6 weeks; this is also the minimum interval to be used when scheduling a second dose. However, if an interval as short as 4 weeks was used, the dose does not need to be repeated.

❿ If the interval between doses in a 2 dose HPV schedule is shorter than 5 months (150 days), a 3rd dose should be given at least 24 weeks after the 1st dose and 12 weeks after the 2nd dose. This schedule applies only to those starting a series prior to their 15th birthday.

VACCINE REFERENCE GUIDE

IMMUNOSUPPRESSIVE MEDICATIONS

Steroids

Prednisone: 2 weeks of 20 mg/day in adults or 2 mg/kg/day in children considered immunosuppressive

Equivalent steroid doses

20 mg. of prednisone is equivalent to:
100 mg cortisone
80 mg hydrocortisone
20 mg prednisolone
16 mg triamcinolone
16 mg methylprednisolone
3 mg dexamethasone
2.4 mg betamethasone

The steroid budesonide is the active ingredient in entocort (capsules and enema – used to treat Crohn's disease), pulmicort, rhinocort, symbicort. Budesonide is a synthetic glucocortisteroid with high topical potency and weak systemic effects. It will not cause immunosuppression.

Antimetabolites

Methotrexate
Azathioprine (Imuran)
6 – mercaptopurine (Purinethol)
Cyclophosphamide (Procytox, Cytoxan)

Often used as cancer chemotherapy or to treat severe arthritis.
Most cancer therapeutic agents are immunosuppressive with the exception of Tamoxifen and gonadotropin release inhibitors.

TNF inhibitors (Anti-TNF antibodies, TNF receptor blockers)

Used to treat rheumatoid arthritis, juvenile arthritis, psoriatric arthritis, Crohn's disease, ankylosing spondylitis and osteoporosis.

infliximab (Remicade)	alemtuzumab (Mab CamPath)
etanercept (Enbrel)	beracizumab (Avastin)
adalimumab (Humira)	canakinumab (Ilaris)
certolizumab (Cimzia)	natalizamab (Tysabri)
golimumab (Simponi)	ofatamumab (Arzerra)
denosumab (Prolia)	basiliximab (Simulect)

There is a class of drugs much the same as TNF inhibitors and used to treat the same conditions. These are T-cell co-stimulation inhibitors, interleukin inhibitors and B-cell depletors.

abatacept (Orencia)
anakinra (Kineret)
tocilizumab (Actemra)
rituximab (Rituxan)
belimumab (Benlysta)
alefacept (Amevive)
belatucept (Nulojix)
daclizumab (Zenapax)
muromonab (Orthoclone OKT3)
tositumomab (Bexxar)
ibritumomab Tiuxetan (Zevalin)
tofacintinib (xelijanz)–I'm not sure this is *immune-suppressive* Can't find enough info yet. SB
efalizumab (Raptiva)
ustekinumab (Stelara) – human IgG monoclonal antibody used to treat plaque psoriasis
eculizumab (Soliris)

Transplant related immunosuppression

Sirolimus (Rapamune)
Tacrolimus (Prograf)
Cyclosporine (Neoral)
mycophenolate mofetil

Drugs used to treat Multiple Sclerosis (MS patients with relapsing-remitting disease should not be vaccinated with yellow fever vaccine)

Immunosuppressive drugs used to treat MS:

fingolomod (Gilenya)
interferon beta-1a (Avonex, Rebif)
mitoxantrane (Hospira)
natalizumab (Tysabri)
glatiramer (Copaxone)
teriflunomide (Aubagio)

Non-immunosuppressive drugs used to treat MS

Fampridine (Fampyra)

Not immunosupppressive

Omalizumab (Xolair) – IgGAb that selectively binds to human IgE. Used to treat eosinophilic pneumonia (does not affect T cells and should not have any effect on vaccine safety or efficacy)

DRUG INTERACTIONS

Malarone – Atripla (efavirenz, emtricitabine, tenofovir) used to treat HIV. Efavirenz decreases the serum concentration of atovaquone by as much as 75%.

C**iprofloxacin** – Flouroquinolone antibiotics may worsen symptoms in people with myasthenia gravis. Ciprofloxacin has been associated with tedinopathies and tendon ruptures.

Antidepressants that can cause Q-T prolongation:

citalopram (celexa)
escitalopram (cipralex)

Antidepressants that have no effect on Q-T interval:

fluoxetine (Prozac)
paroxetine (Paxil)
sertraline (Zoloft)

TRAVEL CLINIC
PRESCRIPTION DRUG DIRECTORY

Generic Trade	Indication	Dose	Comments
Amoxil	URTI-pharyngitis, sinusitis	500 mg TID x 10 days	For people with recurrent URTI's
Lorazepam Ativan	Sleeping aid	0.5-1.0 mg Sublingual or oral	
Zopiclone Imovane	Sleeping aid	5 mg-7.5 mg oral	
Valcyclovir Valtrex	For treatment & suppression of recurrent genital herpes & cold sores	Cold sores 2000 mg x 2 doses 6-12 hours apart. Genital herpes 1000 mg	
Fluconuzole (Diflucan-150)	Single dose treatment for vaginal candidiasis	150 mg O.D.	
Salbutemol Ventolin	Asthma	1-2 puffs prn	This is only for people who have had this prescribed before
Cephalexin	Skin Infections	500 mg QID x 10 days	For remote travel
Epi-Pen Adult	Anaphylaxis	One Pen	Use as directed for Anaphylaxis
Nitrofurantoin MacroBID	UTI	100 mg twice daily for 7 days	For people with recurrent UTI"s
Ciproflaxacin Cipro	UTI	500 mg twice daily for 5 – 7 days	For people with recurrent UTI"s
Metronidazole (Flagyl)	Giardia	500 mg twice daily for 5-7 days	For people who have had giardia in past or who are required to carry it by tour company.

VACCINE REFERENCE GUIDE

TRAVEL TO HIGH ALTITUDES

This document provides a brief overview of altitude illness. If you are a serious climber and/or going to very high altitudes, it should be used in conjunction with other resources.

Rapid exposure to high altitudes may cause travellers to feel ill and may even cause serious medical problems. The incidence of acute mountain sickness (AMS) has been reported to be 25% at 7,000 feet and 50% at 15,000 feet. The more rapid your ascent, the more likely you are to experience AMS. Age and level of physical fitness are not significant factors in preventing altitude illness. People who are prone to migraines or have conditions like obesity, obstructive sleep apnea, chronic obstructive pulmonary disease, congestive heart failure and congenital heart disease may be more likely to experience altitude illness.

Altitude illness is caused by a decrease in air pressure and oxygen content at altitude. Low oxygen content in blood is responsible for symptoms. Sleeping altitude is critical as lower ventilation during sleep causes an even greater drop in blood oxygen content.

The symptoms of AMS may begin during ascent to high altitudes but usually occur 6 - 48 hours later. The symptoms of AMS may progress to the more serious symptoms of high altitude pulmonary edema (HAPE) and high altitude cerebral edema (HACE).

AMS - Headache, shortness of breath, nausea, vomiting, insomnia, facial swelling, fluid retention with weight gain and decreased urination.

HAPE - Shortness of breath, low grade fever, cough.

HACE - Severe headache, vomiting, loss of consciousness, death.

Signs of Significant Altitude Illness

IN YOURSELF: Resting pulse over 110, breathing quickly at rest, loss of appetite and unusual fatigue while walking

IN OTHERS: Skipping meals, antisocial behaviour and the last person to arrive at the destination.

RULES TO AVOID DEATH:

1. Recognize symptoms and admit you have them. Don't ignore symptoms for fear of being left behind or ruining a trip.
2. Never ascend to sleep at a higher level if symptoms are present.
3. If symptoms remain while at rest, one must descend!

PREVENTION:

The best way to prevent altitude illness is to ascend slowly. Climbers and hikers should sleep at a lower altitude than they have climbed to that day. Travellers should avoid excess dietary salt and fluid intake should be normal. Drugs with central nervous system side effects (e.g. antidepressants, sleeping pills, alcohol) should be used cautiously at higher altitudes. Overexertion during the first few days should be avoided.

CAUTION:

Coca tea will be offered in Peru and Bolivia as a way of preventing and treating altitude illness. There is no scientific evidence to support its use and some recent studies indicate that it might increase the risk of AMS and heart rhythm problems. Do not travel with coca tea, it contains cocaine in very small amounts and is considered an illegal substance in most countries. Travellers consuming coca tea may test positive to cocaine metabolites if subjected to drug screening.

NASAL CONGESTION:

Many climbers will experience nasal congestion which can interfere with sleep. Nasal saline drops used before bed can help to alleviate this.

VACCINE REFERENCE GUIDE

ACETAZOLAMIDE (DIAMOX)

Acetazolamide is a drug that can be taken to prevent and treat AMS. It quickens acclimatization and prevents or shortens the duration of AMS. There are other dosage regimes for acetazolamide, but this is the one most recently endorsed by experts in altitude illness.

Acetazolamide should be started 2 days before ascent, during ascent and 2 days after ascent. The dose is 125 mg, (half of a 250 mg tablet) twice a day - once in the morning and once in the evening. For short flights to high altitude locations such as Cuzco and LaPaz, a 5 day supply of acetazolamide is sufficient.

Acetazolamide is a non-antibiotic sulfone drug (not a sulfa drug). It may be taken safely by persons with allergy to antibiotics that contain sulfa. Individuals with a history of life-threatening reactions to sulfa drugs or multiple drug allergies should take a test dose of acetazolamide prior to the trip. Very rarely, acetazolamide may cause bone marrow suppression and crystals in urine. It should not be taken by pregnant and nursing women or very young children. Side-effects commonly reported are tingling in the hands and feet, ringing in ears or a temporary decrease in hearing, loss of appetite, task alterations, increased urination, nausea, vomiting, diarrhea and occasionally, drowsiness and confusion.

Acetazolamide may also be used to treat mild cases of AMS. The dose is 500 mg every 12 hours and can be decreased to 500 mg every 24 hours when improvement is noted.

IBUPROFEN

There is a preliminary study showing that high dose ibuprofen (Advil, Motrin) may work almost as well as acetazolamide in preventing high altitude headache but further testing is required. Acetazolamide prevents more severe headaches so remains the best prevention for high altitude travellers.

The study dose used was ibuprofen 600 mg three times a day. The study examined trekkers who took the drug at the start of ascent and up until arrival at high altitude destination.

Ibuprofen has been shown to give the greatest relief for headaches associated with AMS.

DEXAMETHASONE

Dexamethasone is a strong steroid drug that is used to treat high altitude cerebral edema (brain swelling). It should not be used to prevent altitude illness. Steroids such as dexamethasone have many serious side effects but the most worrisome in this situation is a feeling of euphoria and difficulty judging the seriousness of a situation. These side effects can often cause a climber to continue to ascend in the face of life threatening altitude illness. Dexamethasone is prescribed for climbers to use for emergency descents above 20,000 feet.

Remember, altitude illness can be a serious disease and the only real treatment is descent. If you have symptoms of AMS that are not getting better or are getting worse, seek medical help!

SOME HIGH ALTITUDE LOCATIONS:

PLACE	FEET	METRES
Mt. Everest, Nepal	29,028	8,848
Everest Base Camp	17,598	5,364
Mt. Kilimanjaro, Tanzania	19,340	5,895
Salkantay Pass, Peru (Highest elevation on Salkantay Trek)	15,200	4600
Warmiwanuska Pass, Peru (Highest elevation on Inca Trail)	13,796	4205
Lhasa, Tibet	12,002	3,658
Cuzco, Peru	11,600	3,400
La Paz, Bolivia	11,736	3,577
Quito, Ecuador	9,249	2,819
Machu Picchu, Peru	8,003	2,440

Publicly funded Immunization Programs in Canada – Routine Schedule for Infants and Children including special programs and catch-up programs (as of March 2015)

Information on immunization programs was collected by the Canadian Nurses Coalition on Immunization (CNCI). PHAC and the CNCI have worked together since July 2004 to develop this tool containing the latest provincial/territorial program information.

Routine Schedule for Infants and Children

Province or Territory	DTaP-IPV-Hib	DTaP-IPV	Tdap or Tdap-IPV	HB	MMR	Var	MMRV	Men-C	Men-C-A, C, Y, W-135	Pneu-C-13	Inf	HPV	Rot
NACI recom-mendation	2, 4, 6, 18 mths	4-6 yrs	14-16 yrs	Infancy (3 doses OR Pre-teen/teen (2-3 doses)	12 mths AND 18 mths OR 4-6 yrs OR MMR-Var 2 doses	12-18 mths AND 18 mths OR 4-6 yrs OR MMR-Var 2 doses	12 mths AND 18 mths OR 4-6 yrs	Infancy (1-4 doses)[1] AND Preteen (1 dose)[1]	Pre-teen (1 dose) [1]	2 , 4 ,6, 12-15 mths	6-59 mths (1-2 doses)	9-14 yrs (2 doses at 0, 6-12 mths)[2]	2 ,4 ,6 mths
BC	2, 4, 6 (DTaP-HB-IPV Hib), 18 mths (DTaP-IPV-Hib)	4-6 yrs	Tdap, Gr 9	2, 4, 6,mths (DTaP-HB-IPV-Hib)	12 mths	12 mths	4-6 yrs	2, (4 HR), 12 mths, Gr.6	N	2, 4 (6 HR), 12 mths	6-59 mths	Females Gr. 6 (2 doses 6 mths apart)	2, 4 mths
AB	2, 4, 6, 18 mths	4-6 yrs	Tdap, Gr 9	Gr. 5	N	N	12 mths, 4-6 yrs	4, 12 mths	Grade 9 (1 dose)	2, 4, (6 HR), 12 mths	≥ 6 mths	Gr.5 Catch-up Males Gr.9	2, 4 mths (starting June 01, 2015)
SK	2 , 4, 6, 18 mths	4-6 yrs	Tdap, Gr 8	Gr. 6	N	Catch-up Gr. 6 until Aug. 2015	12-18 mths	12 mths	Gr. 6	2, 4, (6 HR), 12 mths	≥ 6 mths	Females Gr. 6	2, 4 mths
MB	2, , 6, 18 mths	N	Tdap-IPV 4-6 yrs, Tdap, 14-16 yrs	Gr. 4 (starting Sept 2017, 2 doses in Gr. 6)	N	N	12 mths, 4-6 yrs	12 mths, Gr. 4 (moving to Gr.6 in Sept 2019)	N	2, 4, (6 HR), 12 mths	≥ 6 mths	Females Gr. 6; Catch-up until Gr.12	2, 4 mths
ON	2, 4 ,6, 18 mths	N	Tdap-IPV 4-6 yrs, Tdap, 14-16 yrs	Gr. 7	12 mths	15 mths	4-6 yrs	12 mths	Gr. 7	2, 4, (6 HR), 12 mths	≥ 6 mths	Females Gr. 8 Catch-up until Gr.12	2, 4 mths

VACCINE REFERENCE GUIDE

Province or Territory	DTaP-IPV-Hib	DTaP-IPV	Tdap or Tdap-IPV	HB	MMR	Var	MMRV	Men-C	Men-C-A, C, Y, W-135	Pneu-C-13	Inf	HPV	Rot
QC	2, 4, 18 mths (DTaP-HB-IPV Hib), 6 mths (DTaP-IPV-Hib)	N	Tdap-IPV 4-6 yrs, Tdap, 3rd yr of high school	2, 4, 18 mths (DTaP-HB-IPV-Hib), Gr. 4	12 mths	N	18 mths	12 mths 3rd yr of high school; Catch-up < 18 yrs	N	2, 4, (6 HR) 12 mths	6-23 mths	Females Gr. 4; Catch-up Females < 18 yrs	2, 4 mths
NB	2, 4, 6, 18 mths		Tdap, Gr. 7 Tdap-IPV, 4 yrs (currently in place but will switch over to DTaP-IPV)	0, 2, 6 mths		One dose born between 2000 and 2008; ;Catch-up 2 doses children born in 2009 or later	12, 18 mths	12 mths	Gr. 9	2, 4, 12 mths	6mths-18 yrs	Females Gr. 7	N
NS	2, 4, 6, 18 mths	N	Tdap-IPV 4-6 yrs, Tdap Gr. 7	Gr. 7	N	N	12 , 18mths; Catch-up 4-6 yrs	12 mths, Gr. 7	N	2, 4, 12 mths	≥ 6 mths	Females Gr. 7	N
PE	2, 4, 6, 18 mths	4-6 yrs	Tdap, Gr. 9	2, 4, 18 mths	N	N	12, 18 mths	12 mths	Gr. 9	2, 4, (6 HR), 18 mths	6-59 mths	Females Gr. 6	2, 4 mths
NL	2, 4, 6, 18 mths	4-6 yrs	Tdap, Gr. 9	Gr. 6 (2 doses, 4 months apart)	N	N	12 mths	12 mths	Gr. 4	2, 4, 12 mths	6-59 mths	Females Gr. 6	
NT	2, 4, 6, 18 mths	4-6 yrs	Tdap, Gr. 9	0, 1, 6 mths; Catch-up > 5 yrs, Gr.4 and Gr. 9	Catch-up pre-kindergarten, Gr.4 and Gr.9	Catch-up <5 yrs, Gr.4 and Gr.9 (students who have received only 1 dose prior)	12, 36 mths; Catch-up Pre-kindergarte, ≤ 12 yrs (school)	2, 12 mths; Catch-up < 5 yrs, Gr.4 and Gr. 9	Gr.12 students who will be attending post-secondary education outside NT	2, 4, 6, 18 mths	≥ 6 mths	Females Gr. 4; Catch-up Gr. 9-12	2, 4 mths
YT	2, 4, 6 (DTaP-HB-IPV-Hib), 18 mths (DTaP-IPV-Hib)		Tday-IPV 4-6 yrs, Tdap Gr. 9	2, 4, 6 mths (DTaP-HB-IPV-Hib); Catch-up ≤19 yrs)	12 mths, 4-6 yrs	12 mths, 4-6 yrs	N	2, 12 mths; Gr. 6, post-secondary students not previoiusly immunized	N	2, 4, (6 HR), 12 mths (3 doses) (4 dose series for high risk) (1 dose for HIV+ ≥60 mths of age not previously immunized)	≥ 6 mths	Females Gr. 6 (2 doses)	2, 4 mths
NU	2, 4, 6, 18 mths	4-6 yrs	Tdap, Gr. 9 (14-16 yrs)	0, 1, 9 mths	12-18 mths; Catch-up Gr. 12	15 mths	N	12 mths; Catch-up Gr. 9 (14-16 yrs)	N	2, 4, 6, 15 mths, plus PP23 (1 dose) 2-3 yrs	Universal ≥ 6 mths	Females Gr. 6 (≥ 9 yrs)	N

VACCINE REFERENCE GUIDE

Legend:

DTaP: Diphtheria, Tetanus, Acellular Pertussis

HB: Hepatitis B

Hib: Haemophilus Influenzae Type b

HPV: Human Papillomavirus

Inf: Influenza

IPV: Inactivated Poliomyelitis

Men-C: Meningococcal conjugate

MMR: Measles, Mumps, Rubella

MMRV: Measles, Mumps, Rubella and Varicella

Pneu-C-13: Pneumococcal conjugate 13 valent

PP23: Pneumococcal polysaccharide 23 valent

Rot: Rotavirus

Tdap: Tetanus, Diphtheria, Acellular Pertussis

Var: Varicella

Source: Canadian Nurses Coalition on Immunization, 2013

Public Health Agency of Canada

Date modified: May 21, 2015

For updates, go to:

www.iamat.org

> See companion IAMAT publication *Be Aware of Schistosomiasis*

GUIDE

World Schistosomiasis Risk Chart

Geographical distribution of Schistosomiasis and principal snail vectors

2015 Edition

SCHISTOSOMIASIS COUNTRY INFORMATION

Algeria	G1	Guadaloupe	G25	Nigeria	S.h., S.m., S.g., A (I, II, IV, IX)
Angola	S.h., S.m., A2 (II, V, IX)	Guinea	S.h., S.m., B26 (II, IX)	Oman	S.m., D50 (XIII)
Antigua and Barbuda	G3 (VII)	Guinea-Bissau	S.h., C27 (II)	Philippines	S.j., C51 (XVI)
Benin	S.h., S.m., S.g., A (I, II, IX)	India	G28	Puerto Rico	G52 (VII)
Botswana	S.h., S.m., D4 (II, V, IX)	Indonesia	S.j. D29 (XV)	Rwanda	S.m., E53 (VI, IX, XII)
Brazil	S.m., C5 (VII, X, XI)	Iran	G30	Saint Lucia	S.m., D54 (VII)
Burkina Faso	S.h., S.m., S.g., A6 (I,II, IX)	Iraq	S.h., D31 (I)	São Tomé and Príncipe	S.g., F55 (III)
Burundi	S.m., C7 (VI)	Japan	G32 (XVII)	Saudi Arabia	E56 (I, VI, XIII)
Cambodia	S.me., D8 (XIX)	Jordan	G33	Senegal	S.h., S.m., A57 (I, IV, VI, IX)
Cameroon	S.h., S.m, S.g., A9 (I, II, III, IV, IX)	Kenya	S.h., S.m., C34 (II, V, VI, IX, XII)	Sierra Leone	S.h., S.m., C58 (II, IX)
				Somalia	S.h., C59 (VI)
Central Africa Republic	S.h., S.m., B10 (I, II, III, IX)	Laos	S.me., D35 (XIX)	South Africa	S.h., S.m., S.ma., D60 (II, V, IX)
Chad	S.h., S.m., F11 (I, III, IX)	Lebanon	G36	South Sudan	S.h., S.m., A61 (I, II, IX, XII)
China	S.j., C12 (XV)	Liberia	S.h., S.m., C37 (II, IX)	Sudan	S.h., S.m., A (I, II, IX, XII)
Congo – Dem. Rep.	S.h., S.m., S.i, F13 (II, V, VI, IX)	Libya	S.h., S.m., D38 (I, II, VIII)	Suriname	S.m., D62 (VII)
Congo – Republic	S.h., S.m., F14 (I, II, VI)	Madagascar	S.h., S.m., E39 (VI, IX)	Swaziland	S.h., S.m., S.ma., A (II, V, IX)
Côte d'Ivoire	S.h., S.m., B15 (I, II, IX)	Malawi	S.h, S.m., A40 (II, IX)	Syria	S.h., D63 (I)
Djibouti	G16	Malaysia	G41	Tanzania	S.h., S.m.,C64 (I, II, V, VI, IX, XII)
Dominican Republic	G17	Mali	S.h., S.m., S.g., C42 (I,III, IX)	Thailand	G65
Egypt	S.h., S.m., C18 (I, VIII)	Martinique	G43	Togo	S.h., S.m., A (II, III, IX)
Equatorial Guinea	S.g., F19 (III)	Mauritania	S.h., S.m., F44 (II,IV, VI)	Tunisia	G66
Eritrea	S.m., C20 (XI, XII)	Mauritius	G45	Turkey	G67
Ethiopia	S.h., S.m., A21 (V, VI, IX, XII)	Montserrat	G46	Uganda	S.h., S.m., A68 (II, VI, IX, XII)
France	S.h. D22 (XIV)	Morocco	G47	Venezuela	S.m., D69 (VII)
Gabon	S.h., S.m., S.g., F23 (I, III)	Mozambique	S.h., S.m., A (II, V, IX)	Yemen	S.h., S.m., A70 (I, VI, VIII, IX, XIII)
Gambia	S.h., S.m., A24 (I, IV, VI, IX)	Namibia	S.h., S.m., D48 (II, V, IX)	Zambia	S.h., S.m., S.ma., A (II, IX)
Ghana	S.h., S.m., A (I, II, IX)	Niger	S.h., S.m., A49 (IX)	Zimbabwe	S.h., S.m., A (II, IX)

For references to roman numerals, see Page 2.

SCHISTOSOMIASIS RISK CODES

Risk of Schistosomiasis caused by: Schistosomiasis
risk presence:

S.h.	**S. haematobium**
S.m.	**S. mansoni**
S.j.	**S. japonicum**
S.me.	**S. mekongi**
S.mal.	**S. malayensis**
S.g.	**S. guineensis**
S.i.	**S. intercalatum**
S.ma.	**S. mattheei**

A **Whole country, including urban areas.**

B **Whole country, full extent of risk unknown due to incomplete mapping.**

C **Limited to some regions, area described.**

D **Described areas only.**

D:\Input\139.173.54.12\VACCINE_REFERENCE_GUIDE_June_2015_2015_06_26_01_25_16_501.DOC

(rarely transmitted to humans)

E Most of country, except areas described.

F Full extent of risk unknown due to fragmentary research.

G Schistosomiasis transmission is interrupted. Country awaiting evaluation and verification from World Health Organization for confirmation.

Roman numerals refer to the principal specific snail acting as intermediate host.
Illustrations are actual size unless otherwise specified.

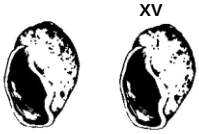
I Bulinus truncatus

II Bulinus globosus

III Bulinus forskalii

IV Bulinus senegalensis

V Bulinus africanus



VI See text for intermediate snail

XVI

VII Biomphalaria glabrata

VIII Biomphalaria alexandrina

IX Biomphalaria pfeifferi

X Biomphalaria straminea

Biomphalaria tenagophila

Biomphalaria sudanica

Biomphalaria arabica
(No illustration available)

Species not identified

Oncomelania hupensis
(x 2.4 natural size)

Oncomelania quadrasi
(x 2.4 natural size)

Oncomelania nosophora
(x 2.4 natural size)

Ferrissia tenuis
(x 6.5 natural size)

Neotricula aperta
(No illustration available)

Is it safe to swim? What about white water rafting?

Even if there is no Schistosomiasis risk in the lake, pond, river or stream, you may still be at risk of other illnesses. It may look clean, but consider industrial contamination, agricultural run-off, human or animal waste, and infections like *E. coli* and Leptospirosis before jumping in.

Algeria: Public health authorities report no new human cases of *S. haematobium* and await WHO evaluation and verification. Schistosomiasis was previously reported in the municipality of Khemis El-Khechna (El Hamiz River dam) in the province of Boumerdès and in the oases of Djanet, Iherir and Tamadjert (Tassili N'Ajjer National Park) in the province of Illizi. Snail intermediate host: *Bulinus truncatus.*

Angola: *S. haematobium* is endemic throughout Angola. *S. mansoni* is endemic in the northern parts of the country, primarily in the provinces of Cabinda, Uige, Zaire, Cuanza Norte, Cuanza Sul, Malaje, and Lunda Norte.

Antigua and Barbuda: Public health authorities report no new human cases of *S. mansoni* and await WHO evaluation and verification. Schistosomiasis was previously reported in Sweets, Liberta, Bendals and the areas surrounding the settlement of John Hughes. Snail intermediate host: *Biomphalaria glabrata*.

Botswana: *S. mansoni* is present in North-West District particularly along the Okavango River and marshlands, and in the villages along the Chobe River.
S. haematobium has been reported along the Limpopo River valley and its tributaries. Localized risk has been reported in Mabule (on the Molopo River), Kanye, and the northeastern areas of Southern District; Lobatse, Otse, Ramotswa, and Gaborone in South-East District; Molepolole and the southeastern areas of Kweneng District; Mochudi and southern areas of Kgatleng District; Xhumo, Nata and areas extending north between the Limpopo River and Palapye (Central District); Francistown (North-East District); Tsau, Maun, Kavimba, Kasane, and Pandamatenga (North-West District).

Note: The Districts of Kgalagadi and Ghanzi (Kalahari Desert) are risk free. Botswana has implemented an integrated Schistosomiasis elimination plan which has kept the disease under control. Risk increases with rainfall and water flow patterns.

Brazil: Public health control programs are ongoing and incidence rates have been reduced. *S. mansoni* is present in rural and suburban areas of the following states, especially around irrigation systems. The full extent of Schistosomiasis risk in Brazil is unknown, especially in the Amazon Basin.
• **North Region:** rural areas of the southern part of Sonora and southern part of Chihuahua, Sinaloa, Durango and Nayarit.
• **Northeastern Region:** Maranhão, Piauí, Ceara, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia.
• **Southeastern Region:** Minas Gerais, Espírito Santo, Rio de Janeiro.
• **South Region:** São Paulo, Paraná (including localized risk at Iguaçu Falls), Santa Catarina, Rio Grande do Sul.

Burkina Faso: *S. haematobium* and *S. mansoni* are endemic throughout the country. *S. guineensis* is also present. Burkina Faso has implemented a national plan to control and eliminate Schistosomiasis resulting in reduced prevalence of the disease.

Burundi: *S. mansoni* is endemic along Lake Tanganyika and the Rusizi Plain, including the capital Bujumbura (provinces of Bujumbura Mairie, Bujumbura Rural and Bururi). Risk is also present in the villages around Lake Cyohoha Sud and Lake Rwihinda (province of Kirundo) and has also been reported from the provinces of Chibitoke and Ruyigi. Additional snail intermediate hosts: *Biomphalaria choanomphala* and *Biomphalaria stanleyi.*
Note: The highlands of central, eastern and southern Burundi are considered risk free. Burundi has implemented a national plan to control and eliminate Schistosomiasis resulting in reduced prevalence of the disease.

Cambodia: *S. mekongi* is present in Stung Treng District (Stung Treng Province) and Kratié Province in the towns and villages along the Mekong River.
Note: Cambodia has implemented a plan to control and eliminate Schistosomiasis in affected regions resulting in reduced prevalence of the disease. However, the lack of improved sanitation and living conditions increase the risk of re-infection.

Cameroon: *S. haematobium* and *S. mansoni* are endemic throughout Cameroon. *S. haematobium* is highly endemic in the regions of Far North and North (Sahel area), and in the regions of Southwest and Littoral. *S. mansoni* is highly endemic in the regions of Far North, North, Adawama and Southwest. *S. guineensis* has been reported in the regions of Centre and Littoral.

Central African Republic: *S. mansoni* is endemic throughout the country. The full extent of Schistosomiasis risk in the country is unknown.

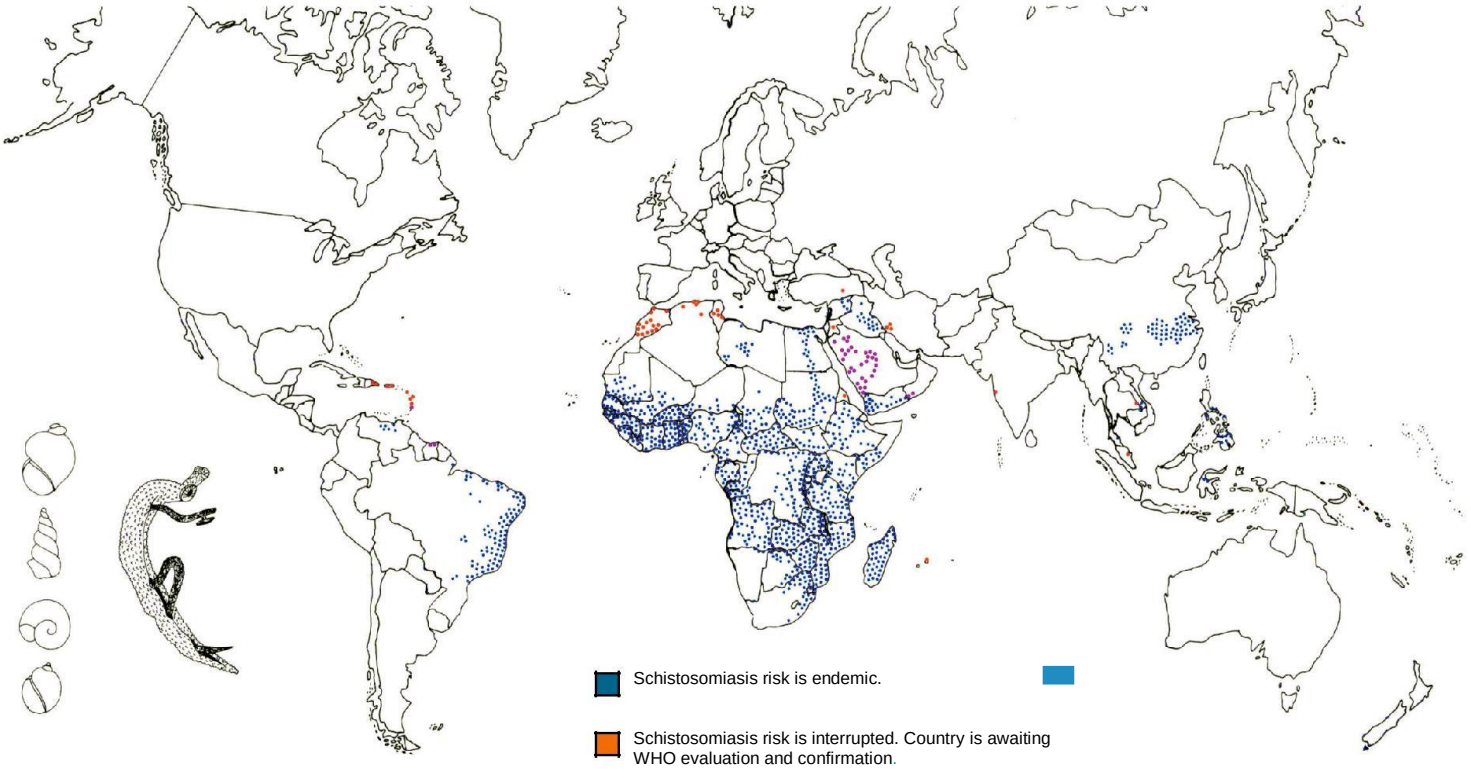
Chad: *S. haematobium* is endemic in the southern departments, including Moyen-Chari, Logone Occidental, Tandjile, Mayo-Kebbi Est, Hadjer-Lamis, N'Djamena, and Chari-Baguimi (western border with Cameroon) as well as the northwestern region of Tibesti and eastern region of Wadi Fira. The full extent of Schistosomiasis risk in Chad is unknown. Travellers should consider all oases as well as temporary and permanent bodies of water at risk.

China: Extensive Schistosomiasis control programs have successfully eradicated *S. japonicum* from many previously endemic areas. Cases are reported from along the Yangtze River, including tributaries and adjacent lakes of the following provinces: Jiangsu, Anhui, Jiangxi (around Lake Poyang and on the eastern border with Zhejiang and Fujian), Hubei (area north of Wuhan as far as Xiangyang and in the south just before the Three Gorges Dam), and in Hunan (around Lake Dongting and the area of Changsha). Cases are also reported in Sichuan Province in the irrigation system around Chengdu and in the area of Xichang between the Yalong and Anning riv-ers. In Yunnan province, cases are reported from the area surrounding Lijiang, including the Yangtze and Mekong (Lancang) River valleys, and further south to Lake Erhai and Weishan.

Congo - Dem. Rep.: *S. haematobium* and *S. mansoni* are endemic in the provinces of Orientale, Maniema, Katanga, Kinshasa, and Bas-Congo. Cases are reported from Lake Kivu and LakeTanganyika. *S. intercalatum* has been reported from the provinces of Orientale and Maniema.
The full extent of Schistosomiasis risk in the Democratic Republic of Congo is unknown. Additional snail intermediate hosts for *S. mansoni*: *Biomphalaria choanomphala*, *Biomphalaria smithi* and *Biomphalaria stanleyi*.

Congo - Republic: *S. haematobium* is endemic in the departments of Lékoumou, Niari, Kouilou, Pointe Noire, Bouenza, Pool, and Brazzaville. The department of Sangha is non-endemic.
The full extent of *S. mansoni* and *S. haematobium* risk in the Congo is unknown. Snail intermediate host for *S. mansoni*: *Biomphalaria camerunensis*.

Côte d'Ivoire: *S. mansoni* and *S. haematobium* are endemic throughout the country. The full extent of Schistosomiasis risk in Côte d'Ivoire is unknown, especially in parts of the following regions: Zanzan, Vallée du Bandama, N'zi-Comoé, Lagunes, and Haut-Sassandra.



Schistosomiasis risk is endemic.

Schistosomiasis risk is interrupted. Country is awaiting WHO evaluation and confirmation.

Schistosomiasis control and elimination programs in place, further assessment needed.

Map Source: IAMAT, WHO

Djibouti: Public health authorities report no new human cases of *S. mansoni* and await WHO evaluation and verification. Snail intermediate host: *Bulinus truncatus*.

Dominican Republic: Public health authorities report no new human cases of *S. mansoni* and await WHO evaluation and verification. Cases were previously reported in the eastern interior region in the provinces of Hato Mayor, El Seibo, and La Altagracia (in the area of Higüey). Snail intermediate host: *Biomphalaria glabrata*.

Egypt: Egypt has implemented Schistosomiasis control and elimination initiatives resulting in reduced prevalence of the disease. Cases are reported from the Nile Delta region, including in the areas of Faiyum and the Suez Canal zone, and along the Nile River down to the Aswan Dam area.

Equatorial Guinea: *S. guineensis* has been reported in the area of Bata.
The full extent of Schistosomiasis risk in the Equatorial Guinea is unknown.

Eritrea: *S. mansoni* is endemic in the regions of Gash-Barka, Anseba, Debub, Maekel, and Northern Red Sea especially around irrigation projects.

Ethiopia: *S. mansoni* is endemic in Ethiopia, including in the Omo, Awash, and Blue Nile river valleys. *S. haematobium* is also present, specifically in the lower Awash Valley, along the Shebelle River in Ogaden (Somali Region) on the border with Somalia, and in the western part of the country on the border with South Sudan. Additional intermediate snail host for *S. haematobium*: *Bulinus abyssinicus*.

France: Local transmission of *S. haematobium* was reported recently from Corsica. Travellers swimming in the Cavu River (commune of Zonza) north of Porto Vecchio were diagnosed with Schistosomiasis. Public health authorities are conducting epidemiological investigations to determine transmission patterns, including the intermediate snail host involved.

Gabon: Risk of *S. haematobium* has been identified in the provinces of Estuaire, Moyen Ogooué, Ngounié, Nyanga, and Ogooué-Lolo. *S. guineensis* has also been reported throughout the country. The full extent of Schistosomiasis risk in the Gabon is unknown.

Gambia: *S. haematobium* and *S. mansoni* are endemic along the Gambia River basin. Snail intermediate host for *S. haematobium*: *Bulinus jousseaumei*.

Guadaloupe: Public health authorities report no new human cases of *S. mansoni* and await WHO evaluation and verification. Cases were previously reported from the entire island of Grande-Terre and the coastal areas of Basse-Terre. Snail intermediate host: *Biomphalaria glabrata*.

Guinea: *S. haematobium* and *S. mansoni* are endemic throughout Guinea, although the full extent of Schistosomiasis risk is unknown, specifically in the regions of Mamou and Faranah.

Guinea-Bissau: *S. haematobium* is endemic in Guinea-Bissau, particularly in the valleys of the Cacheu and Gêba rivers, and along the border with Guinea.
There is no Schistosomiasis risk on the islands in the Bijagós Archipelago.

India: Public health authorities report no new human cases of *S. haematobium* and await WHO evaluation and verification. Cases were previously reported in the area around Gimvi (district of Ratnagiri, Maharashtra) in the hills along the Konkan coast south of Mumbai. Snail intermediate host: *Ferrissia tenuis*.

Indonesia: Only the province of Central Sulawesi is considered endemic. Risk is present in the Lindu Valley and localized around Lake Lindu (Anca, Langko, Tomado and Puro'o) and in the Napu Valley (about 50 km southeast of Lindu Valley (Wuasa, Maholo, Winowanga, Alitupu and Watumaeta). Indonesia has implemented a plan to control and eliminate Schistosomiasis in the area, resulting in reduced prevalence of the disease. Snail intermediate host: *Oncomelania hupensis lindoensis*.

Iran: Public health authorities report no new human cases of *S. haematobium* and await WHO evaluation and verification. Cases were previously reported in the plains of the province of Khuzestan on the southwestern border with Iraq, specifically Sūsangerd (Dasht Mishan), Khorramshahr, Hamidiyeh, Ahvaz, Dezful, Shushtar, Mian Ab, Haft Tapeh, including the Sardasht area. Snail intermediate host: *Bulinus truncatus*.

Iraq: Iraq has implemented a Schistosomiasis control and elimination program resulting in reduced prevalence of the disease. *S. haematobium* cases have been reported along the entire Euphrates and Tigris (as far north as Samarra) river systems, their tributaries, irrigation canals, marsh areas, and urban areas. Isolated cases have been reported in the area of Tall Kayf (Nineveh Governorate) and in Al Qa'im (Al-Anbar Governorate).
Note: The mountainous regions of the northeastern part of the country bordering Iran, namely the provinces of Erbil, Kirkuk, and Sulaymaniyah are risk free.

Japan: Transmission of *S. japonicum* has been interrupted in humans and the disease is considered eradicated from Japan. However, the intermediate snail host *Oncomelania nosophora* is present in the Kofu basin (Yamanashi Prefecture) and along the Obitsu River (Chiba Prefecture). Monitoring programs continue to be in place.

Jordan: Public health authorities report no new human cases of *S. haematobium* and await WHO evaluation and verification. Cases were previously reported from Wadi Al Hasa and Ghor Al Safi (Karak Governorate) and in agricultural villages in the southern Jordan Valley near the Dead Sea. Snail intermediate host: *Bulinus truncatus*.

Kenya: *S. haematobium* and *S. mansoni* are endemic in Kenya, especially in the irrigated agricultural zones and densely populated urban and suburban areas around Lake Victoria, adjacent islands, and on the Kano Plain (districts of Bondo, Kisumu East, Kisumu West, Nyando, Rachuonyo,

Homa Bay, and Suba in Nyanza Province).
Risk is also present on the plains to the north, east, and northeast of Nairobi, especially in the districts of Kitui and Machakos; the lower valley of the Tana River in the southeastern part of the country extending from the towns of Garissa to Hola; the Indian Ocean coastal areas from Lamu to the border with Tanzania, including the area of Mombasa; Lake Jipe and sur-rounding areas, including Taveta, Wundanyi, and Voi. Localized risk exists in Wajir and Wajir Bor in North Eastern Province and in Kimilili in Western Province. Additional snail intermediate hosts: *Bulinus ugandae, Bulinus tropicus* and *Bulinus nasutus* for *S. haematobium*; *Biomphalaria choanomphala* for *S. mansoni*.

Laos: Risk of *S. mekongi* is present on Khong Island in the Mekong River bordering Cambodia as well as in the districts of Pak Sé and Champassak further north.

Lebanon: Public health authorities report no new human cases of *S. haematobium* and await WHO evaluation and verification. Cases were previously reported in the area of the
itani River delta near Sarafand between Tyre and Sidon. Snail intermediate host: *Bulinus truncatus*.

Liberia: *S. haematobium* and *S. mansoni* are endemic in the interior counties of Nimba, Bong, Gbarpolu, and Lofa. The full risk status for Grand Gedeh and River Gee counties is unknown.
Note: The coastal counties are considered risk free.

Libya: Libya has implemented Schistosomiasis control and elimination programs resulting in reduced prevalence of the disease. *S. mansoni* cases have been reported in the area of Tawergha (approximately 50 km south of Misrata). *S. haematobium* has been reported in Al Fuqaha.

Madagascar: *S. haematobium* is highly endemic in the northern, western, and southern areas of Madagascar. *S. mansoni* is endemic throughout the country except in the northern province of Antananarivo.
Madagascar experiences high rates of internal migration which facilitates the spread of Schistosomiasis. Travellers should consider the entire island at risk. Additional snail intermediate host for *S. haematobium*: *Bulinus obtusispira*.

Malawi: *S. haematobium* and *S. mansoni* are endemic throughout the country, including Lake Malawi.

Malaysia: Public health authorities report no new human cases *S. malayensis* and await WHO evaluation and verification. Cases were previously reported in the areas of Jurantut and Kuala Tahan (Pahang State) near Orang Asli indigenous settlements. Cases have also been reported from the states of Perak and Kedah. In Sabah, risk was reported in the areas of Kota Kinabalu, Sandakan, Tawau. Snail intermediate host: *Robertsiella kaporensis*.

Mali: *S. haematobium* is highly endemic throughout Mali, especially in the highly populated areas of the Niger and Sénégal river basins and their tributaries. High incidence rates have been reported from the urban areas of Bamako, Ségou, and Mopti regions. The risk status in the region of Kidal is unknown. *S. mansoni* has also been reported throughout the country. *S. guineensis* is also reported. Travellers should consider the entire country at risk.

Martinique: Public health authorities report no new human cases of *S. mansoni* and await WHO evaluation and verification. Snail intermediate hosts: *Biomphalaria glabrata* and *Biomphalaria straminea*.

Mauritania: *S. haematobium* is present in the southern part of Mauritania. The highest rates are reported from popu-lated areas along the Sénégal River, the Karakoro River valley including the settlements along their tributaries and diversion canals. Other regions reporting cases include Inchiri, western Hodh Ech, Chargui, southwestern Hodh el Gharbi, western Adrar, Assaba, and western Tagant. *S. mansoni* has been reported in the southern region of Trarza along the Sénégal River. The full extent of Schistosomiasis risk in the Mauritania is unknown.
The nomadic life of Mauritanian herdspeople facilitates the spread of infection. Travellers should consider all oases and settlement areas at risk. Additional snail intermediate host: *Bulinus umbilicatus*.

Mauritius: Public health authorities report no new hu-man cases of *S. haematobium* and await WHO evaluation and verification. Cases were previously reported in the districts of Pamplemousses, Port Louis and Grand Port. Snail intermedi-ate host: *Bulinus cernicus*.

Montserrat: Public health authorities report no new human cases of *S. mansoni* and await WHO evaluation and verification. Cases were previously reported in Trant's, Farm, Bethel, Bramble and Tuitts. Snail intermediate host: *Biomphalaria glabrata*.

Morocco: Public health authorities report no new human cases of *S. haematobium* and await WHO evaluation and verification. The last cases were reported from the prov-inces of Béni Mellal, Chtouka Aït Baha, El Kelaa Des Sraghna, Errachidia, and Tata. Snail intermediate host:
Bulinus truncatus.

Namibia: *S. haematobium* and *S. mansoni* are highly endemic in the northern regions of Kavango and Zambezi, affecting the villages along the Cubango, Chobe, and Zambezi rivers. *S. haematobium* is also endemic in the region of Omusati.

Niger: *S. haematobium* and *S. mansoni* is highly endemic throughout Niger, especially in the Niger River basin and sur-rounding areas, including the capital Niamey.

Oman: Oman has implemented Schistosomiasis control and elimination programs resulting in reduced prevalence of the disease. Cases have been reported in the Governorate of Dhofar, primarily affecting the provinces of Salalah, Taqah and Sadah.

Phillipines: Risk is present on the following islands:
• **Luzon:** The Irosin-Juban valley on the southern tip of the island (Sorsogon province) and in the northeastern municipality of Gonzaga (Cagayan province).
• **Mindoro:** Area surrounding Lake Naujan, including the villages of Pola, Victoria and Naujan (Oriental Mindoro province).
• **Samar:** The entire western coastal area from Allen to Basey (Western Samar province) and along the northern coast from Lavezares to Palapag, extending south to Las Navas (Northern Samar province).
• **Leyte:** The entire island (Leyte province) except for the southern quarter (the area south of Julita and MacArthur).
• **Bohol:** Northern coastal areas of Talibon and Trinidad (Bohol province).
• **Negros:** Municipality of Calatrava (Negros Occidental province).
• **Mindanao:** Villages along the Bay of Panquil from Tangub City to Lala and around Dipolog City (Misamis Occidental, Lanao del Norte and Lanao del Sur provinces); in all villages in the Agusan River valley from Butuan to Compostela Valley province; in the northern coastal peninsula area from Butuan to Tago, including the area around Lake Mainit (Surigao del Norte and Surigao del Sur provinces); in the area around Davao and Tagum City on the Bay of Davao (Davao del Sur and Davao del Norte provinces). Additional localized cases are present in Malaybalay and Maramag (Bukidnon province) and Pikit (Cotabato province). Cases have also been reported from South Cotabato, Maguindanao, and Sultan Kudarat provinces.

Puerto Rico: Public health authorities report no new human cases of *S. mansoni* and await WHO evaluation and verification. Snail intermediate host: *Biomphalaria glabrata*.

Rwanda: *S. mansoni* is endemic throughout the country – including lakes Muhazi, Kivu, Rweru, Mugesera, Burera, and Ruhondo.
Note: Akagera National Park and the following districts are considered risk free: Kayonza and Gatsibo (East Province), Rulindo (North Province), Kicukiro and Nyarugenge (Kigali Province), Kamonuyi, Ruhango, Nyanza, Huye, and Nyamagabe (South Province).
Additional snail intermediate hosts*: Biomphalaria choa-nomphala*, *Biomphalaria stanleyi*, and *Biomphalaria smithi*.

Saint Lucia: Saint Lucia has implemented Schistoso-miasis control and elimination programs resulting in reduced prevalence of the disease. The last cases were reported from the quarters of Labourie, Micoud, and Vieux Fort.

São Tomé and Principe: Risk is present throughout the island of São Tomé. The highest incidence rates are reported from the districts of Lobata, Água Grande and Mé-Zóchi. The full ex-tent of Schistosomiasis risk on the island of Príncipe is unknown.

Saudi Arabia: Saudi Arabia has implemented Schis-tosomiasis control and elimination programs resulting in reduced prevalence of the disease. *S. haematobium* and *S. mansoni* has been reported throughout the country except in the regions of Eastern, Al-Qassim and Northern Borders. Ad-ditional snail intermediate hosts for *S. haematobium*: *Bulinus beccarii* and *Bulinus wrighti*.

Senegal: Risk of *S. haematobium* and *S. mansoni* is present throughout the country. High incidence rates occur along the entire Sénégal River valley including the area of Lac de Guiers in the northwestern part of Saint-Louis Region. Ad-ditional snail intermediate hosts for S. haematobium: *Bulinus jousseaumei.*

Sierra Leone: *S. mansoni* is endemic throughout the country. High risk areas include the districts of Bombali, Koina-dugu, Kono, Kailahun, Kenema, Tonkolili, and Western Area Rural. *S. haematobium* has also been reported in the districts of Koinadugu, Tonkolili, Kenema, and Western Area Rural.

Somalia: *S. haematobium* is endemic in the south-ern regions of Hiran, Benaadir, Gedo, Lower Juba, Middle Juba, Lower Shabele, and Middle Shabele especially in the agricultural areas of the Shabeelie and Jubba river valleys. Additional snail intermediate host: *Bulinus abyssinicus*.

South Africa: *S. haematobium* and *S. mansoni* are endemic in KwaZulu-Natal Province, including the entire plain and coastal areas (limited to the west by the Drakensberg Escarpment) and extending south along the coast into Eastern Cape Province to the area of Port St. Johns.
Risk is also present in the province of Limpopo (including Kruger National Park) extending from the Limpopo River basin and its tributaries south to the northern part of the Witwatersrand mountains. In North West Province, cases have been reported from Marico, Swartruggens and Rustenburg district with localized infections in Koster, Wolmaransstad and Bloemhof on the Vaal River and in Piet-Retief district (Mpumalanga Province) in the eastern part of the state on the border with Swaziland.

South Sudan: *S. haematobium* and *S. mansoni* are pres-ent throughout the country and highly endemic in the Upper Nile region (Unity State). *S. mansoni* is highly prevalent in West Equatoria region..

Suriname: Suriname has implemented Schistosomiasis control and elimination programs resulting in reduced prevalence of the disease. Cases have been reported in the central part of the coastal region in the cultivated areas surrounding Paramaribo, extending from the marsh areas north of Wageningen (Nickerie District) to the delta area of the Commewijne.

Syria: Syria has implemented Schistosomiasis control and elimination programs resulting in reduced prevalence of the disease. Cases have been reported in the northern part of the country along the Balikh and lower Euphrates river basins; in the Ar Raqqah area extending
north to Tell Abiad and south along the Euphrates River valley to Al-Bukamal on the border with Iraq.

Tanzania: *S. haematobium* and *S. mansoni* are endemic in Tanzania. High incidence rates are reported on the shores and islands of Lake Victoria, and further inland in the region of Shinyanga and in the eastern part of the country specifically in Tanga and Dar Es Salaam regions. Cases are also reported from Lake Malawi and Lake Tanganyika. In Zanzibar (Unguja and Pemba islands) Schistosomiasis is also endemic, but control and elimination programs have recently been imple-mented. Additional snail intermediate hosts: *Bulinus nasutus* for *S. mansoni* and *Biomphalaria choanomphala* for *S. haematobium.*

Thailand: Public health authorities report no new human cases of *S. mekongi* and await WHO evaluation and verifica-tion. Cases were previously reported in the region of Chong Mek (near the confluence of the Mun and Mekong rivers) in Ubon Ratchathani province on the border with Laos. Snail intermediate host: *Neotricula aperta*.

Tunisia: Public health authorities report no new human cases of *S. haematobium* and await WHO evaluation and verification. Cases were previously reported in the Governorate of Gabès (Al-Hammah, Matmata and Al-Zar At) and in the Governorate of Gafsa (commune of Degache). Snail intermediate host: *Bulinus truncatus.*

Turkey: Public health authorities report no new human cases of *S. haematobium* and await WHO evaluation and

verification. Cases were previously reported in villages on the southeast border with Syria, mainly in the Nusaybin area (Mardin Province) and Akçakale (Şanliurfa Province). Snail intermediate host: *Bulinus truncatus*.

Uganda: *S. haematobium* and *S. mansoni* are endemic in Uganda. The highest incidence rates are reported from the shores of Lake Albert, the Albert Nile (White Nile) River, Lake Kyoga, and the eastern shores of Lake Victoria. Cases are reported from Lake Nyinambuga (Kabarole District). Additional intermediate snail hosts: *Bulinus nasutus* for *S. haematobium* and *Biomphalaria choanomphala* for *S. mansoni.*

Venezuela: Risk of *S. mansoni* is limited to the highly populated agricultural areas surrounding Lake Valencia (states of Carabobo and Aragua). Cases have also been reported along the area from Valencia in the west to La Victoria in the east and south to Belén. Localized risk has also been reported in the parish of Caraballeda (Vargas State), Cúa on Rio Tuy and Guatire (Miranda State).

Yemen: *S. haematobium* and *S. mansoni* are endemic in Yemen. The highest incidence rates are reported from the governorates of Hajjah and Ta'izz. Additional snail intermediate hosts for *S. haematobium*: *Bulinus beccarii and Bulinus wrighti.*

This information has been compiled from various sources, including IAMAT's own research. Please contact us for a list.