

# Taking A Shot at Travel Immunizations



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International travel continues to be a growing activity. The World Trade Organization estimates international travel in 2004 grew by almost 10%, with projected future growth in the range of 4% per year.<sup>1</sup> Therefore, exposure to travel-related infections is increasing and will likely continue to do so in the foreseeable future.

The three most important pre-travel health issues that must be addressed by travel medicine practitioners are vaccine-preventable diseases, antimalarial medications and traveller's diarrhea prevention and management.

## Evaluating the risks

A basic principle of travel medicine is for the practitioner to carry out a risk assessment and then recommend strategies for risk management.

When providing pre-travel advice, it is important to establish the risk of exposure to infections. This can be estimated by obtaining information on the exact destinations, the purpose of the trip, the type of accommodation and planned activities (Table 1).

## Pre-travel immunizations

Travel-related immunizations may be divided into three categories: routine, required and recommended. The pre-travel visit is an excellent opportunity to review a patient's childhood/adult immunization status and provide any necessary boosters. This is especially true for adult patients who may not have had their tetanus booster or even be aware of their immunization status for other infections, such as varicella or measles.

Table 1

### Establishing exposure risk

#### Destination

- Rural or urban
- Malaria-endemic zone
- High altitude
- Beach or jungle

#### Reason

- Business
- Pleasure
- Visiting friends and relatives
- Sex tourism

#### Time

- Length of trip
- Season (rainy or dry?)

#### Accommodation

- Camping
- Hotel
- Hostel

#### Planned activities

- Sunning on a beach
- Trekking
- Driving
- Sex tourism

Table 2

## Travel vaccines

Name	Type	Recommended for	Duration to effect
Japanese encephalitis	Freeze-dried, formaldehyde inactivated	Travellers who will spend > 1 month in rural endemic area	Full effect after third dose; vaccine course should be completed 10 days prior to travel due to possible delayed reaction
Meningococcal	Polysaccharide	Travellers to endemic areas, especially if prolonged contact with local population is anticipated; required for pilgrimage to Mecca	10 to 14 days
Rabies	Freeze-dried inactivated virus cultivated in human diploid cells	For travellers planning to live or work in areas where rabies is enzootic; children are at highest risk of infection	Full effect after third dose
Influenza	Inactivated	For travellers to areas where influenza may be circulating	10 to 14 days
Yellow fever	Live attenuated	Travellers to endemic regions or to countries requiring proof of vaccination prior to entry	10 days
Polio	Inactivated	Booster once only for anyone travelling to countries with ongoing polio outbreaks	Immediate after booster
Varicella	Live attenuated	Adolescents and adults who have never been immunized or have not had the disease	10 to 14 days

### Yellow fever resources

- A list of approved centres to administer the yellow fever vaccine can be found at: [http://www.phac-aspc.gc.ca/tmp-pmv/travel/clinic\\_e.html](http://www.phac-aspc.gc.ca/tmp-pmv/travel/clinic_e.html)
- A complete list of countries where yellow fever occurs is available at: [http://www.phac-aspc.gc.ca/tmp-pmv/info/yf\\_fj\\_e.html](http://www.phac-aspc.gc.ca/tmp-pmv/info/yf_fj_e.html)

### Routine

Routine immunizations that should be reviewed and provided, if necessary, include tetanus and diphtheria, pertussis, hemophilus, measles, mumps and rubella.

### Required

Required vaccinations are those that are necessary to cross international borders. For example, various countries require proof of vaccination against yellow fever before allowing a visitor entry.

### Recommended

Recommended immunizations are administered on the basis of an assessment of the risk of a vaccine-pre-

### Vaccine info: Hepatitis A

- There are four hepatitis A vaccines available which are interchangeable.
- Patients require 2 doses, 6 to 18 months apart.
- The vaccine has a rapid onset and, for the last-minute traveller, the first dose of the vaccine may be given en route to the airport.
- It has been suggested that two doses confer lifetime protection.<sup>4</sup>

### Vaccine info: Hepatitis B

- Administer on day 0, 1 and 2 months before travel, with a booster at 1 year.
- For travellers who appear less than 1 month pre-departure, a dose at day 0, 7 and 21, with a booster at 1 year.
- The combined hepatitis A/ hepatitis B vaccine can be given in an accelerated schedule on days 0, 7 and 21, with a hepatitis B booster at 1 year.

### Vaccine info: Typhoid

- A parenteral vaccine and a live attenuated vaccine are currently available in Canada.
- Parenteral vaccine: can be used in children over 1 year and adults; booster every 3 years if there is continued or renewed exposure to typhoid.
- Live attenuated vaccine: oral preparation as 4 capsules or 3 foil sachets; must be taken on alternate days; booster is recommended every 3 to 4 years.
- Travellers should not take antimicrobials or certain antimalarials while taking the oral vaccine

ventable infection. The vaccines most likely to be recommended include hepatitis A, hepatitis B and typhoid. Table 2 outlines some of the commonly recommended travel vaccines.

### *Hepatitis A*

Hepatitis A is one of the most common vaccine-preventable, travel-related illnesses. It is the cause of approximately 50% of cases of acute hepatitis in Canada.

### *Hepatitis B*

In addition to the risk associated with casual sex and skin piercing, virtually all travellers are at risk for hepatitis B from inadequately sterilized medical equipment. A World Health Organization global review of injections in health-care settings revealed anywhere from 1.2% to 75% of equipment was not adequately sterilized, with the highest risk regions being Southeast Asia and the Eastern Mediterranean region.<sup>2</sup>

As it is not possible to predict whether a traveller may require medical care, hepatitis B immunization should be recommended for all travellers to developing countries. As with hepatitis A vaccine, those who respond to hepatitis B immunization are considered to be immune for life.

### *Typhoid*

Typhoid fever is a considerable risk for travellers going to remote areas, usually paying visits to friends and relatives (VFR). A review of cases in the U.S. from 1994 to 1999 found that recent travel was a factor in 44% of cases and almost 80% of imported cases were in VFRs.<sup>3</sup>

### *Traveller's diarrhea*

Traveller's diarrhea (TD) is the most common ailment to afflict travellers. It tends to affect people during the first two weeks of stay and is usually a self-limited disease, lasting one to four days. The most commonly identified pathogen is enterotoxigenic *Escherichia coli* (ETEC),

although several recent studies show that enteroadherent *E. coli* is almost as frequent a cause. Acute TD may also be caused by shigella, campylobacter, yersinia, viruses and, less commonly, parasites.

## Malaria

Malaria is the most frequent life-threatening infection of travellers. It is easily prevented by using malaria chemoprophylaxis and personal protective measures against mosquito bites. In many parts of the world, the parasite has become resistant to chloroquine and, along the Thai-Cambodian and Myanmar borders, the parasite has become resistant to mefloquine. The drugs available for malaria prevention are listed in Table 3.

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### References

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## Vaccine info: Traveller's diarrhea

- A new oral vaccine provides some protection against both cholera and diarrhea caused by ETEC.
- It is approved for use in patients age 2 and over and confers 60% to 70% protection against ETEC TD for approximately 3 months.
- Travellers will still need medications for self-treatment (*i.e.*, loperamide, quinolone antibiotic), as the vaccine does not guarantee full protection against ETEC or cholera and has no effect against other causes of TD.

Table 3

## Drugs for malaria prevention

### Atovaquone/proguanil

- One tablet a day; start one day prior to entering malaria region; take daily while there; continue for 7 days after departure.

### Chloroquine

- 300 mg base once weekly; start one week prior to entering malaria region; take weekly while there; continue for 4 weeks after departure.

### Doxycycline

- 100 mg/day; start 1 day before entering malaria region; take daily while there; continue for 4 weeks after departure.
- Contraindicated in pregnancy and children under 8.

### Mefloquine

- 250 mg/day; start 1 week prior to entering malaria region; take weekly while there; continue 4 weeks after departure.
- Contraindicated in those with psychiatric history.
- Thoroughly discuss potential adverse events and alternatives when prescribing.

### Primaquine

- 2 tablets/day; start 1 day before entering malaria region; take daily while there; continue for 3 days after departure.
- Must check G6PD level prior to prescribing.