

## 2.2 VACCINATION FOR INTERNATIONAL TRAVEL

### Introduction

The number of Australians who travel overseas has increased steadily over recent years and now between 3.5 and 4.5 million exits are made annually. Although many of these trips are to countries where health risks exist, the majority of Australians travelling overseas do not seek pre-travel health advice.<sup>1</sup> Every year, Australian travellers are injured, become ill, or even die, while travelling abroad. Some of the infectious diseases that cause some of this morbidity and mortality are preventable through vaccination.<sup>2,3</sup>

There is a range of travel vaccines that target infectious diseases that are more common in different or less-developed environments, and therefore travel itineraries should be assessed for the level of risk for these diseases.<sup>3</sup> Factors such as the interval between the initial presentation and the departure date, destination, length of stay, activities during travel, type of accommodation, personal medical history, age of the traveller, previous vaccination status and financial constraints, all have a potential impact on vaccine recommendations. It is important to identify travellers who may be at increased risk for travel related illness, such as pregnant women, children, people with chronic systemic illness or people with impaired immunity. Recent immigrants and their Australian-born children are at particular risk of acquiring some of these infections when they return to their country-of-origin to visit relatives and friends.<sup>4</sup>

### Infections acquired by travellers

Common infections acquired by travellers include those which follow ingestion of contaminated food or water.<sup>2,5</sup> Most of these are diarrhoeal diseases due to enteric pathogens, but infections with extra-intestinal manifestations, such as hepatitis A and typhoid, are also acquired this way. Vaccines are available for cholera, hepatitis A and typhoid.

Insect-borne (particularly mosquito) infections, such as malaria and dengue, are important causes of fever in Australian travellers returning from endemic areas, southeast Asia and Oceania in particular.<sup>5</sup> Japanese encephalitis occurs throughout much of Asia and probably throughout Papua New Guinea. Yellow fever occurs only in parts of Africa and Central and South America, while tick-borne encephalitis occurs in parts of Europe and Asia. Vaccines are available for Japanese encephalitis, yellow fever and tick-borne encephalitis.

Vaccine-preventable infections transmitted via respiratory droplets include influenza, invasive meningococcal disease and measles; influenza may be the most frequent vaccine-preventable infection among travellers.<sup>6</sup> Tuberculosis, although rare, is mostly acquired by expatriates who live in high-risk areas for long periods.

Blood-borne infections, such as hepatitis B, hepatitis C and human immunodeficiency virus (HIV), may pose a threat to some Australian travellers. In remote areas of some countries, there is the possibility that these viruses are transmitted by healthcare workers using non-sterile medical equipment. Hepatitis B vaccine is relevant to many travellers.

Travellers may be exposed to a variety of other exotic infections such as rabies from dog (and other mammal) bites in many countries, schistosomiasis after swimming in African lakes, and leptospirosis after rafting or wading in contaminated streams. Of these, only rabies can be prevented by vaccination.

## Practical aspects of travel vaccine administration

Consider each traveller individually, in the context of the specific itinerary. There is no 'correct' list of vaccines for any single country. Ideally the vaccinations should be started early, to minimise any adverse events around the time of departure and allow sufficient time for adequate immunity to develop.

First, consider routine vaccines; all travellers should be up-to-date with current standard vaccine recommendations. Then consider any other vaccines that may be relevant to the individual's usual health status, occupation or lifestyle (eg. pneumococcal polysaccharide vaccine for an elderly person, hepatitis B vaccine for a first aid officer). These should be offered before consideration of the travel vaccines.

Travel vaccines should be considered according to risk. Priority should be given to vaccines for diseases that are common and of significant impact (such as influenza and hepatitis A), and to those diseases which, although less common, have severe potential adverse outcomes (such as Japanese encephalitis and rabies). Booster doses should be considered where appropriate (see Table 2.2.1); a 'rapid schedule' for a combined hepatitis A/B vaccine is available for those  $\geq 16$  years of age with limited time before travel (see the appropriate vaccine chapters). For children, consider the lower age limits for recommendation of selected vaccines (see Table 2.2.2).

It is important to document travel vaccines appropriately, not only in the clinic's record but also in a suitable record that can be carried by the traveller.

## Vaccines

All intending travellers should have been vaccinated according to the recommended vaccination schedule for the traveller's age. All children should be vaccinated according to the National Immunisation Program (NIP) schedule. In exceptional circumstances, the NIP vaccines may be administered at the minimum age rather than the recommended age (see Section 1.3.5, *Catch-up*, Table 1.3.7 *Minimum age for the first dose of vaccine in exceptional circumstances*). Children vaccinated using the minimum age rather than the recommended age may require extra vaccine doses to ensure adequate protection. The minimum

interval between doses must be adhered to (see Section 1.3.5, *Catch-up*, Table 1.3.6 *Minimum dose intervals for NIP vaccines for children <8 years of age*).

### Measles

Most measles outbreaks now follow infection imported by inadequately vaccinated young travellers. Therefore, Australians born during or since 1966 who have not received 2 doses of a measles-containing vaccine should be vaccinated with MMR before travelling. Varicella vaccine should be offered to travellers who have not had clinical disease or where serology demonstrates lack of immunity (remembering that 2 doses, separated by at least a month, are required by those  $\geq 14$  years of age).

### Tetanus

Adult travellers should be adequately protected against tetanus before departure, particularly if there could be delays in accessing health services. They should receive a booster dose of dT if more than 10 years have elapsed since the last dose. Protection against pertussis may also be offered at this opportunity (as dTpa) if no previous dose of dTpa has been given.

### Poliomyelitis

All travellers should be age-appropriately immunised against polio. If travelling to countries where wild polio virus still exists (Afghanistan, India, Nigeria, and Pakistan), inactivated poliomyelitis vaccine (IPV) should be offered to those who have not completed a 3-dose primary course of any polio vaccine, and a single booster dose should be given to those who have previously completed the primary course. For an up-to-date list of affected countries see <http://www.polioeradication.org>.

### Influenza and pneumococcal disease

Travellers aged  $\geq 65$  years, and those with any medical risk factor, should receive the seasonal influenza vaccine and should have received the 23-valent pneumococcal polysaccharide vaccine. All travellers should consider influenza vaccine, especially when heading to the northern hemisphere winter.

### Hepatitis B

All children and adolescents should have been vaccinated against hepatitis B according to the NIP schedule. As they could be exposed to hepatitis B virus during unplanned medical procedures, all travellers intending to spend a month or more in Central and South America, Africa, Asia or Oceania should be vaccinated against hepatitis B.

## Hepatitis A

Hepatitis A vaccine should be given to all travellers  $\geq 1$  year of age travelling to moderately to highly endemic countries (including all developing countries). There is no place for the routine use of normal human immunoglobulin to prevent hepatitis A in travellers (see Chapter 3.5, *Hepatitis A*).

## Typhoid

Typhoid vaccine should be given to travellers  $\geq 2$  years of age travelling to endemic regions, which include the Indian subcontinent, most southeast Asian countries, many south Pacific nations and Papua New Guinea (see Chapter 3.23, *Typhoid*).

## Cholera

Cholera vaccination is rarely indicated for travellers,<sup>3</sup> as the risk of acquiring cholera is extremely low, and the protection is of relatively short duration. It is only indicated for those travellers at considerable risk, such as those working in humanitarian disaster situations. However, it can also be considered for those travellers with achlorhydria and for those at increased risk of severe or complicated diarrhoeal disease (see Chapter 3.2, *Cholera*).

Certification of cholera vaccination has been abandoned globally, and no countries have official entry requirements for cholera vaccination (see Chapter 3.2, *Cholera*).

## Rabies

Travellers to rabies-endemic regions should be advised of the risk, and to avoid close contact with either wild or domestic animals, and they should be advised on what to do should they be either bitten or scratched by an animal while abroad (see Chapter 3.1, *Australian bat lyssavirus infection and rabies* and also refer to the World Health Organization website [www.who.int](http://www.who.int)).

Pre-travel (ie. pre-exposure) rabies vaccination (or, if appropriate, booster doses) is recommended for expatriates and travellers who will be spending prolonged periods (ie. more than a month) in rabies-endemic areas. (NB. This time interval, of more than a month, is arbitrary, and rabies has occurred in travellers following shorter periods of travel). Vaccination before travel simplifies the management of a subsequent exposure because fewer doses of vaccine are needed, and because rabies immunoglobulin (which is often difficult or even impossible to obtain in many developing countries) is not required.

## Japanese encephalitis

Vaccination is recommended for travellers spending a month or more in either the rural areas of Asia or in Papua New Guinea, particularly if travel is during the wet season and/or there is considerable outdoor activity and/or the standard of accommodation is suboptimal. Vaccination is also recommended for expatriates spending a year or more in Asia, even if much of the stay is in urban areas (see Chapter 3.10, *Japanese encephalitis*).

## Meningococcal infections

All children  $\geq 12$  months of age and all teenagers should have received the meningococcal C conjugate vaccine. In addition, the tetravalent meningococcal polysaccharide vaccine (4vMenPV) is recommended for those who intend travelling to parts of the world where epidemics of meningococcal disease occur, in particular the 'meningitis belt' of sub-Saharan Africa.<sup>7</sup> Of note, large epidemics of meningococcal meningitis occurred in Delhi, India, in 1966, 1985 and 2005.<sup>8</sup> The Saudi Arabian authorities require that all pilgrims attending the annual Hajj have evidence of recent vaccination with 4vMenPV<sup>9</sup> (see Chapter 3.12, *Meningococcal disease*).

## Yellow fever

The World Health Organization no longer routinely reports on yellow fever 'infected areas'. Rather, the yellow fever vaccine is now recommended for travellers to yellow fever-endemic countries, in particular those that have reported yellow fever since 1950 (see Chapter 3.25, *Yellow fever*, Table 3.25.1 *Yellow fever endemic countries*).<sup>10</sup>

Briefly, provided there is no specific contraindication, the vaccine is recommended for all those  $\geq 9$  months of age travelling anywhere in any country in West Africa, and for all those  $\geq 9$  months of age travelling outside urban areas of all other yellow fever-endemic countries (see Table 3.25.1).

## Tuberculosis

Vaccination is generally recommended for tuberculin-negative children  $< 5$  years of age who will be living in developing countries for more than 3 months. There is less evidence of the benefit of vaccination in older children and adults, although consideration should be given to vaccination of tuberculin-negative children  $< 16$  years of age who may be living for long periods in high-risk countries (defined as having an incidence  $\geq 100$  per 100 000 population) (see Chapter 3.22, *Tuberculosis*).

## Tick-borne encephalitis

This disease is prevalent in central and northern Europe and across northern Asia during the summer months. The vaccine is available only through Special Access Scheme arrangements in Australia.