

TRAVEL VACCINATIONS: A 10-MINUTE UPDATE

With holiday season fast approaching, the author looks at current thinking and practice around travel vaccinations

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How important are travel vaccinations?

It is important to put vaccine preventable disease into the context of the overall range of health risks for travellers. Although vaccinations are the first, and often only, precaution that springs to mind for many travellers, vaccine preventable diseases are responsible for around only 5% of travel related health risks. Travellers' diarrhoea, respiratory tract infections, pre-existing medical conditions and accidents make up the great majority of the remainder.

When travel vaccinations are indicated, patients should be encouraged to attend at least six weeks before departure. Some vaccinations require a schedule of several injections, and the travel health adviser needs time to assess individual levels of risk, to plan a vaccination schedule and to advise about non-vaccine preventable health risks, including malaria prophylaxis where indicated. Multiple vaccines may be given on the same day at different injection sites. However, if a live vaccine is being given it should be at the same time as other vaccines or with an interval of three weeks built into the schedule between it and other vaccinations.

How do I know which vaccinations to give?

Even if a disease is present in the country, it is not always necessary to vaccinate against it. What must be assessed is the degree of risk to the individual traveller with a specific itinerary for a particular length of time at a particular time of year. Diseases do not respect national boundaries, and even within a single country different areas may carry different levels of risk. Within each of these areas, different travellers with different activities may have different levels of risk. In this article the emphasis will not be on which countries require which vaccinations but in which situations vaccines may be required. This implies individual risk assessment for each traveller.

UK schedule vaccinations

These should be brought up to date by booster doses if necessary. This will apply to many travellers.

Tetanus is a worldwide risk, higher in many resource-poor countries than it is in the UK.

Poliomyelitis is now endemic in only three countries

– Afghanistan, Nigeria and Pakistan – although there has been resurgence in the wake of the conflict in Syria. Adult diphtheria, tetanus and polio vaccine should be used if indicated.

Travellers to areas of poor food and water hygiene and sanitation

Hepatitis A is the most common vaccine-preventable disease risk for the majority of travellers. Hepatitis A is present worldwide, although Western Europe, North America and Australasia have the lowest level of risk. Transmission of infection is via the faecal-oral route. A single dose of hepatitis A vaccine gives over 90% protection after two-four weeks, and a booster dose at 6-12 months gives at least 10 years protection and probably lifelong protection. For last-minute travellers, the initial dose is likely to provide some degree of protection within several days.

Typhoid is much less common in travellers. It may be acquired in many resource poor countries in Asia, Africa and South America, but the highest risk area

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is the Indian subcontinent. It is also transmitted via the faecal-oral route. An injectable capsular polysaccharide vaccine is available, but this type of vaccine is less effective for children under 18 months of age and is therefore not recommended for this age group, for which simple precautions against the consumption of contaminated food and water should be taken. It is given as a single dose and requires a further dose every three years to maintain protection. There is also an oral live vaccine given as three doses on days 0, 2 and 4. It is not suitable for children under six years of age.

Cholera, another disease transmitted by the faecal-oral route, constitutes a very low risk for most travellers but

some, for example aid workers in refugee camps, may be at higher risk. For adults and children over six years of age, two doses are given one-six weeks apart, with a further dose after two years if still indicated. The dose for children aged 2-6 years is three doses one-six weeks apart, with a further dose after six months.

Combined hepatitis A and typhoid vaccines are available and their use reduces the number of injections needed if both vaccines are indicated.

Travellers in close physical contact with local populations

This will apply mainly to travellers such as medical, nursing and aid workers, teachers and others living under local conditions alongside the indigenous population. Backpackers and gap year travellers may also fall within this category.

Diphtheria is still present in many resource poor countries and has also re-emerged in former Soviet countries after the break-up of the USSR. It is transmitted from person to person by respiratory droplet infection. Adult diphtheria, tetanus and polio vaccine should be used if indicated.

Meningococcal infection. The highest risk is found in sub-Saharan Africa (the so-called “meningitis belt”) and on the Hajj pilgrimage, but meningococcal disease is found worldwide. Quadrivalent meningococcal ACW135Y vaccine is now available as a conjugated vaccine, which is more effective than the previous polysaccharide vaccine, producing over 90% seroconversion. It offers no protection against meningitis B.

Travellers at risk need to be vaccinated even if they have previously had routine meningococcal C vaccination as part of the UK schedule, which will not protect them against strains of meningococcus found in the high risk areas. At risk groups include those who are likely to be living for prolonged periods in close contact with local populations, such as medical and other aid workers and teachers. The vaccine can be given to children under the age of one year as two doses one month apart, but for adults and children aged over one year it is given as a single dose.

Tuberculosis. People travelling around Africa, Asia, Central and South America for a prolonged period of time are at highest risk of contracting tuberculosis, but only if they are in very close contact with the indigenous population. BCG vaccine is given intradermally after skin testing to detect previous exposure to TB. It is 70-80% effective in children in UK, but there is little evidence to support effectiveness in adults. Protection lasts for 10-15 years, although there is only limited data on its effectiveness after that time. However, protection is thought to wane gradually. Its main use is for non-immune travellers below 16 years of age and those with occupational exposure below the age of 35 years.

Hepatitis B. Those at highest risk include health care workers, those at risk of illness or trauma likely

to require treatment in facilities where equipment for injections, infusions or surgery is re-used, or those likely to be involved in sexual contact with potentially infected individuals. The usual vaccination schedule is three doses at 0, 1 and 6 months, though an accelerated schedule at 0, 1 and 2 months, with a booster dose at 12 months may be used.

If there is insufficient time before departure for that schedule, an accelerated schedule with doses at 0, 7 and 21 days can be used with a booster dose at 12 months. A booster dose is required every five years.

Long stay travellers and travellers to remote areas

Longer stays, especially in more remote areas, increase the exposure to all travel-related health hazards including food and water, person-to-person transmission and sexual contact, insect vectors, contact with animals, trauma and the need for medical treatment in less than ideal surroundings. Expatriate workers, aid workers, backpackers and gap year travellers may all fall within this category. Many of the resulting vaccination needs have already been addressed in this article.

Diseases do not respect national boundaries, and even within a single country different areas may carry different levels of risk

Rabies is a fatal illness once it has progressed to developing symptoms. It is present in many countries, especially the Indian subcontinent, Africa, Asia and the Americas. It is transmitted by a bite from an infected mammal, most often a dog, though monkeys, bats and other small mammals may also transmit the disease. Scratches from an animal may also transmit infection, as may a lick if there is a break in the skin. As the incubation period in animals is around 14 days, an animal capable of transmitting infection may appear completely normal. In the event of a bite, scratch or lick from an animal, post-exposure vaccination is necessary.

If the individual has not previously been vaccinated, the need for post-exposure treatment is more urgent as human rabies immunoglobulin is needed in addition to the vaccine, and more doses of post-exposure vaccine are needed.

In remote areas it may be difficult or impossible to reach an adequate medical facility rapidly, vaccine supplies may be unavailable or be out of date or

the older, more toxic vaccine may be the only one available. In addition, human rabies immunoglobulin is unlikely to be available or, if available, its source may not have been screened for blood-borne infections. Remote travel should, therefore, lower the travel health adviser's threshold for recommending rabies vaccination prior to travel. A human diploid cell and a purified chick embryo cell are available in the UK. The dosage schedule is 1ml intramuscularly on days

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0, 7 and 28 (or day 21 if time before departure is short). It is possible to give 0.1ml intradermally on the same schedule to reduce the cost of the vaccine to the traveller, but this is "off-label" and should not be used if the patient is taking chloroquine as an antimalarial, as this will reduce the effectiveness of the vaccine given intradermally.

Vaccines for specific destinations

Yellow fever is confined to sub-Saharan Africa and tropical regions of South America, and is transmitted by daytime biting *Aedes* mosquitoes. Many people only develop a fever, but if the disease progresses to causing jaundice, bleeding and multi-organ involvement, which it does in approximately 15% of cases, there is approximately 50% mortality. The vaccine, which in the UK can be given only in approved Yellow Fever Vaccination Centres after suitable training, is a live vaccine.

A single dose confers lifetime immunity. Current International Health Regulations (IHR) recommend that the vaccine is boosted every 10 years, but this does not take account of the evidence supporting lifelong protection. It is expected this guidance will be amended next year (2016), after which travellers will no longer require the 10 year booster dose.

A valid vaccination certificate is required by many countries as condition of entry, and is not valid until 10 days after the date of vaccination. Therefore, last-minute travellers who attempt to enter a country requiring a certificate are likely to be denied entry if their vaccine is less than 10 days old.

As is the case with all live vaccines, care must be exercised when considering yellow fever vaccination in immunocompromised patients, for example those with HIV/AIDS, cancer chemotherapy, recent radiotherapy and those taking high dose corticosteroid drugs, among many others.

Pregnant women have some degree of reduced immunity, and in addition live vaccines are able to cross the placental barrier and enter the foetus. There may, however, be situations in which the risk from yellow fever is higher than the risk from giving the vaccine, but this is a decision for a travel health specialist in conjunction with the patient's obstetrician or physician.

In addition to the general precautions about live vaccines, there are other considerations to be taken into account with yellow fever vaccine. The vaccine should not be given to infants under the age of nine months as it may cause encephalitis, and in the case of previously unimmunised patients over the age of 65 years the vaccine may, in a small proportion of cases, cause severe neurological or multi-organ damage.

Japanese B encephalitis occurs in Southern and Southeast Asia. Infection usually comes from animals, especially pigs, from which the disease is transmitted by mosquitoes. Long-stay travellers are usually at highest risk, especially those travelling through the rainy season, through rural areas or where there is a high level of pig farming or irrigated rice fields. The vaccine can be given to infants aged from two months to three years, with two doses of 0.25ml at 0 and 28 days, and to those aged over three years with two doses of 0.5ml at 0 and 28 days.

Relatively few travellers are likely to fit the risk profile and need this vaccine.

Tick-borne encephalitis occurs in Central and Eastern Europe and Scandinavia. As its name suggests it is transmitted by tick bites. UK travellers likely to be at risk include those taking part in camping or other outdoor activities in Spring, Summer and early Autumn. The vaccine is given as three doses at 0, 1-3 and 9-12 months, though there is an accelerated schedule at 0 and 2 weeks which give approximately 90% protection, albeit over a shorter period.

Other travel related vaccines

Influenza vaccination is important for travellers in the risk groups defined by the NHS flu vaccination programme. All types of respiratory infections are common among travellers, especially when they are travelling together in large groups, for example on cruise ships, and vulnerable travellers need to be protected against influenza. It should also be

Influenza vaccination is important for travellers in the risk groups defined by the NHS 'flu vaccination programme

remembered that influenza occurs in the southern hemisphere during the UK summer months when travellers will not have been protected by UK 'flu vaccination programmes, therefore giving influenza vaccine should be considered outside the usual UK timescale for at risk travellers.

Which travel vaccines are free of charge under the NHS?

The only travel vaccinations that are provided at no cost by the NHS are:

- Poliomyelitis
- Typhoid
- Hepatitis A
- Cholera.

These are vaccines against infectious diseases which the traveller could transmit to others on his/her return. In the case of poliomyelitis, destination countries qualifying for free vaccination are shown on the National Travel Health Network and Centre website at www.nathnac.org

Which vaccines should the traveller pay for?

- Hepatitis B
- Japanese encephalitis
- Meningococcal ACWY
- Rabies
- Tick-borne encephalitis
- Yellow fever.

Essentially, this means travellers will pay for all of the vaccines except polio, typhoid, hepatitis A and cholera. In addition to charging for the cost of the vaccine, a fee for administering it may be charged, plus a fee for issuing a certificate of vaccination if required.

Exceptions to payment

Exceptions to the payment rule include the following categories of patients who can be vaccinated without charge:

- Hepatitis B: Men who have sex with men
- Meningococcal ACWY: Asplenic patients
- Rabies: Veterinarians and registered bat handlers.

All the above are in recognised "at risk" groups and should not be charged, even if travelling abroad.

At risk groups are further defined in the "Green Book", which can be seen at <https://www.gov.uk/government/collections/immunisation-against-infectious-disease-the-green-book>

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What conditions are attached to payment for vaccines?

- The vaccine must be prescribed and purchased privately
- An NHS centrally supplied vaccine must not be used
- NHS reimbursement must not be claimed
- The patient must not be in a recognised "at risk" group for vaccination.

USEFUL INFORMATION SOURCES

Travax database: www.travax.nhs.uk

National Travel Health network & Centre (NaTHNaC): www.nathnac.org

Immunisation Against Infectious Disease ("The Green Book"): <https://www.gov.uk/government/collections/immunisation-against-infectious-disease-the-green-book>

British Global and Travel Health Association www.bgtha.org

Fit for Travel (a public access website based on data from the Travax database) www.fitfortravel.nhs.uk

Vaccine manufacturers
Sanofi Pasteur MSD: spmsd.co.uk
GSK Vaccines: vaccines.co.uk

SUMMARY OF KEY POINTS

- 1 Vaccine preventable diseases are responsible for a minority of health risks for travellers
- 2 Travellers requiring travel vaccinations should be encouraged to attend at least six weeks before departure
- 3 An individual risk assessment is required for each traveller based on the characteristic of the traveller, the destination, the nature of the intended journey and the traveller's intended activities