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International Travel
Part III B: Immunizations

Bureau of Epidemiology, 1100 West 49th Street, Austin, Texas 78756-3180 (512-458-7207)

INTERNATIONAL TRAVEL
PART III B: IMMUNIZATIONS

RECOMMENDED IMMUNIZATIONS

Travel to Japan and the developed countries of Europe generally presents no unusual health risks beyond those encountered in the US. However, travel to developing nations can expose the traveler to diseases virtually non-existant in the US. All international travelers should be immune to the childhood vaccine-preventable diseases (measles, mumps, rubella, tetanus, diphtheria, pertussis, and poliomyelitis) either through vaccination or by having had natural disease. Children should be vaccinated appropriately for their ages.

Measles, Mumps, Rubella

Most persons born before 1957 have been exposed to natural disease. Most persons born after 1957 have been immunized already.

Measles, mumps, and rubella vaccines, whether single or combined antigens, are live virus vaccines and should be administered at least 14 days before or at least 6 weeks, preferably 3 months, after administration of immune globulin (IG), as acquired antibodies may interfere with the response to the vaccine(s). Other precautions and contraindications must be considered, including egg hypersensitivity, allergy to neomycin, pregnancy, etc (see package insert).

Tetanus, Diphtheria, Pertussis

Persons 7 years of age and older should have completed the three-dose primary series of tetanus and diphtheria toxoids (Td) and have had one dose within the preceding 10 years. Children less than 7 years of age should have received the appropriate number of doses of diphtheria, tetanus, and pertussis vaccine (DTP) for their ages.

Local and mild systemic reactions occur frequently. Severe systemic and neurologic reactions occur very rarely. Precautions and contraindications must be considered, including the presence of certain neurological conditions, potential neurological disorders following immunization, allergic hypersentivity, pregnancy, etc.

Poliomyelitis

Three doses of trivalent oral polio vaccine (OPV), with a supplemental dose prior to travel to endemic areas, is the regimen of choice for infants, children, and adolescents. If the child has not completed the primary series prior to travel, at least one dose of OPV should be given.

For adults (over 18 years of age) who are unvaccinated or whose vaccine status is unknown, inactivated polio vaccine (IPV) is recommended. The primary series is four doses (three doses given 1 to 2 months apart followed by a fourth dose 6 to 12 months later), of which at least three should be given prior to travel. Alternative regimens include two doses of IPV, given 1 to 2 months apart, or a single dose of OPV if less than four weeks are available before protection is needed. Adults who have previously received less than a complete series of either vaccine

should receive the remaining doses. Adults who have completed the primary series of OPV and will be at increased risk of exposure to wild polio viruses should receive a single dose of OPV. Adults who have completed the primary series of IPV may be given a supplemental dose of either OPV or IPV. If IPV is used exclusively, a booster dose may be given every five years if exposure continues or recurs.

An extremely small risk of paralysis in healthy vaccine recipients and contacts has been associated with OPV. Persons with immune-deficiency diseases or altered immune status due to diseases or therapies, and household contacts of these persons should not receive OPV; IPV is recommended instead. If a pregnant woman must receive polio vaccine, IPV is recommended if time permits. If less than four weeks are available in which to give two doses of IPV, a single dose of OPV may be given. Persons with a history of anaphylactic reaction to streptomycin or neomycin should receive OPV, as IPV contains both antibiotics.

Haemophilus influenzae, type b

A single dose of Hemophilus b polysaccharide vaccine is recommended for all children at 24 months of age or as soon as possible thereafter. Children 3 to 4 years of age should also be vaccinated. Children 18 to 23 months old, who may be at increased risk of acquiring the disease, may be immunized. They should receive a second dose at 24 to 36 months of age. Children less than 18 months of age do not benefit from the vaccine.

Polysaccharide vaccines are relatively free of side effects; 1% to 2% of recipients will experience redness and/or swelling at the injection site and/or fever. Severe hypersensitivity reactions very rarely have been reported.

Viral Hepatitis, Type A

Hepatitis A is an enteric viral disease, transmitted through contaminated foods and/or drinks or close person-to-person contact. It is highly endemic in developing countries where the level of general sanitation may be low.

Immune globulin (IG) provides passive, short term immunity to hepatitis A, although it is not a true vaccine in that it does not elicit production of antibodies. It is recommended for travelers to developing countries, especially those who will be visiting rural areas or eating and drinking in settings of poor or uncertain sanitation (ie, local markets, restaurants, food vendors) or who will have close contact with young children (who are often asymptomatic sources of hepatitis A).

For short-term travel of three months or less, a single dose of IG, 0.02 ml/kg of body weight, is recommended. For long-term travel, a single dose of IG, 0.06 ml/kg of body weight every 5 months is recommended. Very long-term travelers or persons living in developing countries may benefit from a total anti-HAV antibody screen to determine if they are susceptible to hepatitis A and in need of regular IG prophylaxis, or if they are immune to hepatitis A by virtue of previous infection. There are no known adverse side effects or contraindications to IG, beyond soreness at the injection site(s) due to the volume of IG given.

Typhoid Fever

Salmonella typhi, the causative organism of typhoid fever, is transmitted through contaminated food and, less often, water and is endemic in developing countries. Short-term travelers visiting urban areas on usual tourist itineraries are generally at less risk than persons having prolonged exposure in rural areas.

Typhoid fever vaccine provides only partial (70% to 90%) protection which is also dependent on the number of organims ingested. Even vaccinated travelers must be educated about food and waterborne diseases and take precautions to reduce the risks of acquiring them. The primary typhoid vaccine series consists of two doses given four or more weeks apart, with a booster at three-year intervals if potential exposure continues. An alternative, less effective regimen

consists of three doses at weekly intervals. Typhoid vaccination usually produces pain at the injection site, accompanied by fever, headache and malaise. Pregnant women generally should **not** be vaccinated.

Viral Hepatitis, Type B

Hepatitis B is highly endemic in many developing countries and generally less so in developed countries. Because of the modes of transmission, primarily through activities that involve sexual contact or exchange of blood and body fluids, many short-term travelers will be at virtually no risk, even if visiting highly endemic areas. However, vaccination is recommended for all persons working in health care fields, regardless of the length of stay. Long-term travelers to endemic areas may be candidates for vaccine due to possible sexual contact with local populations and the possibility of requiring blood transfusions or medical and dental care through local facilities.

Primary vaccination consists of three 1.0 ml doses given over a six-month period, requiring travelers who might need the vaccine to plan ahead to complete the series prior to departure. Children under 10 years of age receive three 0.5 ml doses.

Side-effects have been limited to soreness and redness at the injection site (deltoid muscle). Pregnancy is not a contraindication to hepatitis B vaccine (HBV). There is no evidence of interference between HBV and other simultaneously administered vaccines or IG (given at a separate site).

Meningococcal Disease

Meningococcal disease is endemic throughout the world, with occasional epidemics occurring in different areas. Most travelers are at extremely small risk, but those having close contact with local populations during epidemics may benefit from the vaccine. Only one vaccine (quadrivalent A/C/Y/W-135 vaccine) is available in the United States. The serogroup A polysaccharide induces antibody in some children as young as 3 months of age, although a response comparable to that seen in adults is not achieved until 4 to 5 years of age; the serogroup C component does not induce a good antibody response before age 18 to 24 months.

Primary vaccination consists of a single dose of quadrivalent vaccine, with duration of immunity persisting three years or more in persons 4 years of age and older. Children first vaccinated at less than 4 years of age, who are at continued risk, should be revaccinated after 2 to 3 years.

Adverse reactions are infrequent and mild; primarily erythema at the injection site. Pregnant women generally should **not** be vaccinated.

Rabies

All travelers must be aware of the potential for rabies in domestic animals, especially dogs, in developing countries. All animal bites must be attended to immediately and the biting animal assumed to be rabid unless proven otherwise by a competent laboratory.

Travelers visiting areas in which rabies is hyperendemic, or who may be involved in activities in which exposure to rabid animals is likely, should consider receiving a series of three pre-exposure injections (0.1 ml intradermally or 1 ml intramuscularly at days 0, 7, and 21 or 28) of human diploid cell vaccine (HDCV) as pre-exposure prophylaxis against rabies. Should a bite exposure from an animal confirmed or suspected of being rabid occur, 2 post-exposure doses (1ml IM) still need to be administered (days 0 and 3). Pre-exposure prophylaxis avoids the need to administer the full post-exposure series: five 1-ml doses (days 0, 3, 7, 14, and 28) and human rabies immune globulin (HRIG), 20 IU/kg body weight, one half infiltrated at the bite site (if possible), and the remainder administered IM.

NOTE: Pre-exposure rabies immunization **does not** eliminate the need for prompt post-exposure prophylaxis following an exposure; it only reduces the post-exposure regimen and eliminates the need for HRIG.

Because of problems (higher risk of adverse reactions or lack of potency) associated with rabies vaccines produced in many countries, travelers exposed to rabies (including those potentially exposed) should strongly consider either returning to the United States immediately for treatment or having the HDCV and, if indicated, HRIG air-shipped to them from the United States.

Tuberculosis

Although tuberculosis is common in developing countries, TB transmission generally requires extended exposure to an infected person and is not a high-risk disease for most travelers. Persons planning extended stays in endemic areas and close contact with local populations should have a tuberculin skin test prior to travel and, if negative, a repeat test upon return to the US. Persons who develop a significant TB skin test conversion need to be evaluated by a physician and considered for preventive therapy or treatment. Bacillus Calmette-Guerin (BCG) vaccination against TB is widely used outside of the United States. However, the US Public Health Service and the Texas Department of Health do not recommend the routine use of BCG for US citizens and Texans.

CONCLUSION

Because of the large number of potentially required and recommended vaccinations and the time frames required for their appropriate administration, international travelers should plan for immunizations as far ahead of their departures as is possible. There are many other diseases, both exotic and mundane, that may affect travelers and for which no prior vaccines are available. International travelers must take their good health habits and common sense with them when traveling away from home.

For more information on immunizations for international travel and other health-related travel information, consult the Bureau of Epidemiology, TDH, (512)458-7328 or STS 824-9328, or your local health department.

Information provided in this article was abstracted from Health Information for International Travel 1986, HHS Publication No. (CDC)86-8280, and CDC Advisory Memorandum No. 74 "Recommendations for Immunizations for International Travel".

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