

INFORMATION PAPER

Military Vaccine Agency
1 March 2007

SUBJECT: Japanese Encephalitis and Japanese Encephalitis Vaccine

1. Purpose. To describe Japanese encephalitis and the vaccine to prevent it.

2. Facts.

a. Microbiology. Japanese encephalitis (JE) is caused by a flavivirus called the Japanese encephalitis virus, which causes an acute infection of the brain, spinal cord, and lining of the brain (meninges) with high rates of complications, chronic disability, and death. Mild cases of JE involve headache with fever or aseptic meningitis. Severe cases can involve meningitis and coma; up to 30% of such cases die. Half of survivors may suffer neuropsychiatric complications.

b. Epidemiology. JE virus is transmitted by the bite of various species of *Culex* mosquitoes. These mosquitoes feed outdoors from dusk until dawn. The disease is most common in rural, agricultural areas of east and Southeast Asia and certain western Pacific Islands, where mosquito larvae are found in flooded rice fields and marshes. Transmission is highest in the summer and fall.

c. Vaccine. JE vaccine is manufactured in Japan by the Research Foundation for Microbial Disease of Osaka University (known as "Biken") and distributed by Aventis Pasteur with the trade name *JE-Vax*®. *JE-Vax*® is an inactivated whole-virus vaccine licensed in December 1992. It is packaged as a freeze-dried powder in either 1-dose or 10-dose vials. It contains thimerosal within the powder, but no adjuvant. It contains mouse-serum protein and gelatin.

d. Immunization. The standard dosing schedule of *JE-Vax*® is three 1-mL doses subcutaneously, except for children 1 to 3 years old, who receive 0.5 ml for each dose. The three doses are given on days 0, 7, and 30. An abbreviated schedule of days 0, 7, and 14 can be used when the longer schedule is impractical. Both regimens produce similar immunity among recipients. Two doses given a week apart may be used in unusual circumstances and will confer short-term immunity in 80% of vaccinees. The last dose should be administered at least 10 days before beginning travel to ensure an adequate immune response and access to medical care in the event of any delayed adverse reactions. An additional dose is given 2-3 years after the primary immunization if risk of exposure persists. Vaccination during pregnancy should be avoided unless the risk of acquiring JE outweighs the theoretical risk of vaccination.

e. Cautions. The following people should not receive this vaccine: people with known hypersensitivity to this vaccine or a vaccine component. People with multiple allergies, especially a history of allergic urticaria or hives (i.e., angioedema), are at higher risk for allergic complications after JE immunization. Under normal circumstances, vaccinees should not embark on international travel within 10 days of JE immunization because of the possibility of delayed allergic reactions that may need medical assessment. Defer vaccination if the person has a moderate to severe acute illness.

f. Adverse Events. JE immunization results in the typical pattern of injection-site reactions (e.g., redness, soreness, swelling) and systemic effects (e.g., headache, fever, myalgia, malaise). More serious allergic reactions (e.g., urticaria, angioedema, respiratory distress, anaphylaxis) occur in 6 per 1,000 vaccinees, from minutes to as long as 1 week after immunization. Reactions have been responsive to therapy with epinephrine, antihistamines, steroids, or a combination of these. Vaccine recipients should be observed for 30 minutes after immunization and warned about the possibility of delayed allergic reactions.

g. DoD Policy. Administer Japanese-encephalitis vaccine to personnel who are or who will be stationed in rural areas of Asia in which the disease is endemic and where they have substantial risk of exposure to the virus, especially during prolonged field operations at night. The main groups needing Japanese-encephalitis immunization are designated special-operation units, Navy mobile construction battalions, Marine expeditionary units operating in the Western Pacific, and troops assigned or deploying to Okinawa with extended field exposure. For other travelers, vaccinate those who will spend 1 month or longer with extensive outdoor activities in rural areas, such as where rice cultivation or pig farming is common. Under normal circumstances, this immunization is not warranted for personnel assigned to or deploying to Korea.

h. Special Considerations. Aviation personnel will be grounded for 12 hours after immunization, or according to the instructions of their flight surgeon. Personnel who previously experienced urticaria or hypersensitivity of any type after Japanese-encephalitis vaccine will be exempt from flying duties for at least 72 hours after dose one, five days after dose two, and 72 hours after dose three.

3. References.

a. Advisory Committee on Immunization Practices. Inactivated Japanese encephalitis virus vaccine. *MMWR* 1993; 42(RR-1):1-15. <ftp.cdc.gov/pub/Publications/mmwr/rr/rr4201.pdf>

b. CDC disease information. www.cdc.gov/ncidod/dvbid/jencephalitis/index.htm

c. Multiple resources (e.g., product insert, Vaccine Information Statements) assembled by the Military Vaccine Agency: www.vaccines.mil/je

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