

## INFORMATION PAPER

Military Vaccine Agency

6 January 2005

SUBJECT: Rabies Infection and Rabies Vaccine

1. Purpose. To describe rabies and the vaccine to prevent it.

2. Facts.

a. Microbiology. Rabies virus is a member of the Lyssavirus genus, family Rhabdoviridae. Rabies is a preventable viral infection of mammals, most often transmitted through the bite of a rabid animal. Rabies virus infects the central nervous system, causing swelling of the brain (encephalopathy) and eventually death. Early symptoms of rabies in humans are nonspecific, consisting of apprehension, fever, headache, and general malaise. As the disease progresses, neurological symptoms appear and may include insomnia, anxiety, confusion, slight or partial paralysis, excitation, hallucinations, agitation, excessive salivation, difficulty swallowing (which gave rise to the term "hydrophobia," fear of water). Delirium and convulsions often follow. Death usually occurs within days of the onset of symptoms.

b. Epidemiology. Wild animals accounted for 93% of reported animal cases of rabies in the United States in 2001. Domestic animals accounted for the other 7%. The number of reported cases attributable to rabid domestic animals decreased 2.4%, from the 509 cases reported in 2000 to 497 cases in 2001. Worldwide, most human deaths attributed to rabies are caused by dog bites.

c. Vaccine. Two licensed rabies vaccines for humans are distributed in the United States: *Imovax Rabies* and *RabAvert*. Each is a freeze-dried suspension of inactivated rabies virus that contains no preservative and should be used promptly after reconstitution.

(1) *Imovax Rabies* is distributed by Aventis Pasteur, licensed in 1980. The product is produced in cultures of human diploid cells, leading to its abbreviation as HDCV vaccine.

(2) *RabVert* is distributed by Chiron, licensed in 1997. The product is produced in cultures of purified chick embryo cells (PCEC).

d. Immunization. Before exposure (pre-exposure), administer three 1-mL doses of vaccine intramuscularly (IM) in the deltoid muscle, one each on days 0, 7 and 21 or 28. For post-exposure prophylaxis, vigorously clean or irrigate all wounds with soapy water and/or detergent (e.g., povidone-iodine, *Betadine*). In people who have had pre-exposure rabies vaccination, administer two 1-mL IM doses, one immediately and one 3 days later. In people without a history of rabies vaccination, administer immune globulin containing preformed human antibodies (rabies immune globulin, RIG) and one dose of

rabies vaccine immediately (day 0). Then give four additional doses of vaccine on days 3, 7, 14, and 28 (five vaccine doses total).

e. Cautions. In view of the almost invariably fatal outcome of rabies, there is no restriction to post-exposure immunization. Observe the patient for vaccine adverse events if he or she is known to be sensitive to processed bovine gelatin, chicken protein, albumin, neomycin, chlortetracycline, or amphotericin B.

f. Adverse Events. Rabies immunization results in the typical pattern of injection-site reactions and systemic effects (e.g., headache, fever, myalgia, malaise). More serious allergic reactions (e.g., urticaria, angioedema, respiratory distress, anaphylaxis, encephalitis, meningitis, transient paralysis) have occurred.

g. DoD Policy. Administer rabies vaccine to personnel with a high risk of exposure (e.g., animal handlers; certain laboratory, field, and security personnel; personnel frequently exposed to potentially rabid animals in a nonoccupational or recreational setting) in accordance with current ACIP recommendations. Consider vaccination for special-operations personnel who may operate away from reliable medical resources for prolonged intervals. Rabies is endemic in Brazil, Bolivia, Colombia, Ecuador, El Salvador, Guatemala, India, Mexico, Nepal, Peru, the Philippines, Sri Lanka, Thailand, and Vietnam. The disease is also found in dogs in most other countries of Africa, Asia, and Central and South America.

h. Special Considerations. To help prevent rabies, thoroughly wash all bite wounds and scratches with soap, water, and a virus-killing agent such as povidone-iodine solution (e.g., *Betadine*). In studies of animals, thorough wound cleansing alone without other post-exposure prophylaxis markedly reduces the likelihood of rabies transmission.

### 3. References.

a. Advisory Committee on Immunization Practices. Human rabies prevention. *MMWR* 1999;48 (RR-1):1-41. <http://www.vaccines.mil/documents/363rr4801.pdf>

b. CDC disease information. [www.cdc.gov/ncidod/diseases/submenus/sub\\_rabies.htm](http://www.cdc.gov/ncidod/diseases/submenus/sub_rabies.htm)

c. CDC Vaccine Information Statements: [www.cdc.gov/nip/publications/VIS/](http://www.cdc.gov/nip/publications/VIS/)

d. Package Inserts:

*Imovax Rabies*: [www.vaccineshoppe.com/US\\_PDF/LE4733\\_Imovax\\_IM\\_VS.pdf](http://www.vaccineshoppe.com/US_PDF/LE4733_Imovax_IM_VS.pdf)  
*RabAvert*: [www.rabavert.com/images/pkgins.pdf](http://www.rabavert.com/images/pkgins.pdf)

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