

INFORMATION PAPER

Military Vaccine Agency
1 March 2007

SUBJECT: *Haemophilus Influenzae* type b and Hib vaccines

1. Purpose: To describe infection due to *Haemophilus Influenzae* type b (Hib) bacteria and the vaccines to prevent it.

2. Facts.

a. Microbiology. *Haemophilus influenzae* type b (Hib) bacteria can cause serious infection of the lungs, bloodstream, lining covering the brain (meninges), and heart. Despite the second word in its name, Hib bacteria are not related to influenza virus, which causes “the flu.” Before introduction of Hib vaccines, Hib was the most frequent cause of life-threatening infection in children younger than 5 years of age. Although nonencapsulated *H. influenzae* are common, six capsular polysaccharide types are known; strains with the type b capsule caused most invasive *Haemophilus* disease.

b. Epidemiology. Hib occurs globally. Humans are the only known carriers of Hib, which is spread person-to-person via respiratory droplets from nasopharyngeal secretions. Hib was the leading cause of invasive bacterial disease among children in the United States before licensing of Hib conjugate vaccines. An estimated 12,000 cases of Hib meningitis occurred annually before routine vaccination of toddlers. Up to 5% of children who develop Hib meningitis die, and neurologic complications affect up to 38% of survivors. With vaccination, Hib disease in young children has been reduced by 95%. In 2003, there were 11 cases of invasive Hib infection in children younger than 5 years of age. Although Hib is not highly infectious, close contact can lead to outbreaks or secondary transmission of the disease.

c. Vaccine. Several brands of Hib vaccine are available: *ActHIB*® (sanofi pasteur), *PedVaxHIB*® (Merck), and *HibTITER*® (Wyeth). These brands are interchangeable, but using the same brand for all doses is preferred if available. All three vaccines are inactivated conjugated vaccines, meaning the vaccine is made by chemically bonding polysaccharides (sugars) to proteins. The sugars come from the bacteria’s surface capsule. All three brands induce protective antibody levels in more than 90% of children after 2 to 3 doses. About 95% to 100% of vaccine recipients are protected. *PedVaxHIB*® is combined with hepatitis B vaccine in a product called *Comvax*® (Merck).

d. Immunization. Give all infants a primary series of conjugate Hib vaccine, beginning at 2 months of age. The number of doses in the primary series depends on the type of vaccine used. A primary series of *PedvaxHIB*® is two doses at 2 and 4 months of age. *HibTITER*® and *ActHIB*® require a three-dose primary series at 2, 4, and 6 months of age. A booster dose is recommended at 12 to 15 months, regardless of which brand was used earlier. Inject each 0.5-mL dose intramuscularly. The optimal interval between doses is 2 months, with a minimum interval of 4 weeks. Separate the booster dose from the previous dose by at least 8 weeks. Hib vaccines may be given simultaneously with other vaccines. In general, children older than 59 months of age do not need Hib vaccination. Most of these children are immune to the bacteria, probably from asymptomatic infections as infants. However, some older children and adults should be vaccinated because they are at increased risk of invasive Hib disease caused by

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conditions such as sickle cell disease, HIV/AIDS, removal of the spleen, bone-marrow transplant, or cancer treatment.

e. Cautions. Hib vaccine is contraindicated in people with a history of hypersensitivity to any component of the vaccine. Careful review of the patient's history with respect to possible sensitivity and any previous adverse reactions to the vaccine or similar vaccines, and to possible sensitivity to dry natural latex rubber should be completed before immunization. The stopper of the diluent vial contains dry natural latex rubber which may cause allergic reactions. The lyophilized vaccine vial contains no rubber of any kind. Delay vaccination in cases of moderate or severe acute illnesses. Hib vaccines are contraindicated for children younger than 6 weeks of age because of potential development of immunologic tolerance.

f. Adverse Events. The most common adverse reactions to Hib vaccine are swelling, redness, and/or pain at the injection site after the first dose. Up to one in 20 children may develop a fever greater than 101°F. The incidence of these reactions declines with repeat doses. Systemic reactions, such as fever and irritability, are infrequent.

g. DoD Policy. Use Hib vaccine in accordance with ACIP recommendations.

h. Special Considerations. Invasive Hib disease is a reportable condition in most states. Healthcare workers should report any case of invasive Hib disease to preventive medicine offices and health departments.

3. References.

a. Advisory Committee on Immunization Practices. *Haemophilus b* conjugate vaccines for prevention of *Haemophilus influenzae* type b disease among infants and children two months of age and older. *MMWR* 1991; 40(RR-01):1-7.
www.cdc.gov/mmwr/preview/mmwrhtml/00041736.htm

b. CDC disease info. www.cdc.gov/ncidod/dbmd/diseaseinfo/haeminfluserob_t.htm

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

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