INFORMATION PAPER

Military Vaccine Agency
29 December 2010

SUBJECT: Pneumococcal Disease and Pneumococcal Vaccines

1. Purpose: To describe pneumococcal disease and the vaccines to prevent it.

2. Facts:

a. Microbiology. Pneumococcal disease is an infection caused by the bacteria Streptococcus pneumoniae, also known as pneumococcus. The bacteria are lancet-shaped, gram-positive, facultative anaerobic organisms. Some pneumococci are encapsulated and are pathogenic for humans. Ninety serotypes have been identified but only a few serotypes produce the majority of infections. Pneumococci are common inhabitants of the respiratory tract and may be isolated from the nasopharynx of healthy adults. On military installations, as many as 50%–60% of service personnel may be carriers.

b. Disease. The most common presentation of a pneumococcal infection is pneumonia. Symptoms generally include abrupt onset of fever and chills or rigor. Other common symptoms include chest pain, productive cough, shortness of breath, and rapid breathing. Pneumococcal infections may also lead to bacteremia, an infection of the blood, and meningitis, an infection and swelling of the brain. In children pneumococcus is a common cause of otitis media, middle ear infections, and is the leading cause of meningitis in children under 5 years of age.

c. Epidemiology. The reservoir for pneumococcus is the nasopharynx in humans. Streptococcus pneumoniae bacteria are spread through direct person to person contact from respiratory droplets released from secretions in the nose, mouth, and throat. The highest rates of invasive pneumococcal disease occur among children younger than two years of age. Children with asplenia, sickle cell disease, HIV, and cochlear implants are at higher risk for infections. Pneumococcal infections cause about 43,500 cases and 5,000 deaths from invasive disease (bacteremia and meningitis) annually in the United States.

d. Vaccines.

1) Prevnar (PCV 13). This vaccine is manufactured by Wyeth as a sterile suspension of saccharides of S. pneumoniae serotypes 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, and 23F individually conjugated to diphtheria CRM 197 protein. Prevnar 13 was licensed in February 2010 and replaces Prevnar 7. Aluminum phosphate is used as and adjuvant in the vaccine.

2) Pneumovax (PPSV 23). Pneumococcal polysaccharide vaccine is distributed by Merck. It consists of a mixture of highly purified capsular polysaccharides from the twenty three most prevalent or invasive pneumococcal types of S. pneumoniae. Phenol has been added to the vaccine as a preservative.

e. Cautions. Individuals with an allergic reaction to either vaccine or their components should not receive a vaccination. Administer pneumococcal vaccination at least 2 weeks before starting immune-suppressive therapy or elective splenectomy. Avoid vaccination during chemotherapy or radiation therapy. Vaccination of infants born prematurely should be based on consideration of the individual infant's medical status due to risk of Apnea.

f. Immunization.

1) Prevnar 13 should be administered as a four dose series administered at 2, 4, 6 and 12-15 months of age. Each dose is 0.5mL administered intramuscularly. The vaccine is indicated for children 6 weeks through 5 years of age. Children who have received one or more doses of Prevnar 7 may complete the series with Prevnar 13. Children 15 months through 5 years who have completed the schedule using Prevnar 7 may receive one dose of Prevnar 13 to elicit an immune response to the six additional serotypes covered in the vaccine.

2) Pneumovax is administered as a one time 0.5 mL dose administered intramuscularly or subcutaneously. The vaccine is indicated for individuals two years of age and older. ACIP recommends all adults 65 years of age and older should be vaccinated. Those who received PPSV23 before age 65 years for any indication should receive another dose of the vaccine at age 65 years or later if at least 5 years have passed since their previous dose. Those who receive PPSV23 at or after age 65 years should receive only a single dose.

PPSV23 should be administered to adults aged 19--64 years with functional or anatomic asplenia, or chronic or immunosuppressing medical conditions, including those who have asthma. A second dose of PPSV23 is recommended 5 years after the first dose for individuals with asplenia or immunocompromising conditions.

ACIP recommends all adults, 19 – 64 years, who smoke cigarettes should receive, a single dose of PPSV23. Re-vaccination is not recommended.

g. Adverse Events. The most common adverse reactions after vaccination are injection-site complaints such as soreness, warmth, redness, swelling, induration and fever. Serious allergic reactions are very rare.

h. DoD Policy. Administer pneumococcal vaccine to all individuals at high risk of infection per ACIP guidelines or local preventive medicine guidance for disease outbreak prevention.

3. References:

a. Centers for Disease Control and Prevention. Prevention of Pneumococcal Disease Among Infants and Children — Use of 13-Valent Pneumococcal Conjugate Vaccine and 23-Valent Pneumococcal Polysaccharide Vaccine - Recommendations of the Advisory Committee on Immunization Practices (ACIP) . MMWR 2010;59 (No. RR-#):1-24

b. Centers for Disease Control and Prevention. Updated Recommendations for Prevention of Invasive Pneumococcal Disease Among Adults Using the 23-Valent Pneumococcal Polysaccharide Vaccine (PPSV23). MMWR 2010;59(34):1102-1106

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

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