

## INFORMATION PAPER

DHA-IHB  
13 February 2015

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. More than 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.

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), manufactured by Wyeth, is a sterile suspension of thirteen *S. pneumoniae* serotypes individually conjugated to diphtheria CRM 197 protein. Prevnar® 13 was licensed in February 2010 and replaces Prevnar® 7. Aluminum phosphate is used as an adjuvant in the vaccine.

2) Pneumovax® (PPSV 23) polysaccharide vaccine, licensed in 1983, distributed by Merck, consists of a mixture of highly purified capsular polysaccharides from twenty-three *S. pneumoniae* serotypes and replaced a fourteen serotype version licensed in 1977. 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 potential risk of apnea.

f. Immunization.

1) Choice of pneumococcal vaccine:

- a. Prevnar ® 13 should be administered as a four dose series administered at 2, 4, 6, and 12-15 months of age (booster dose). Each dose is 0.5mL administered intramuscularly. The vaccine is indicated for individuals 6 weeks through 65 years of age. Children 15 months through 5 years who have completed the schedule using Prevnar 7 may receive one dose of PCV13 to elicit an immune response to the six additional serotypes covered in the vaccine.
- b. Pneumovax ® 23 is administered as a one-time 0.5 mL dose administered intramuscularly or subcutaneously. The vaccine is indicated for all adults 65 years of age and older, and adults 19 to 64 years of age that are at high risk for invasive pneumococcal disease. A one-time booster dose of PPSV23 is recommended 5 years after the first dose for asplenic and immunocompromised persons.

2) Both PCV13 and PPSV23 should be administered routinely in series to all adults aged ≥65 years of age. Adults aged ≥65 years who have not previously received pneumococcal vaccine or whose previous vaccination history is unknown should receive a dose of PCV13 first, followed by a dose of PPSV23. The dose of PPSV23 should be given 6–12 months after a dose of PCV13. If PPSV23 cannot be given during this time window, the dose of PPSV23 should be given during the next visit. The two vaccines should not be coadministered, and the minimum acceptable interval between PCV13 and PPSV23 is 8 weeks.

3) Adults with immunocompromising conditions, functional or anatomic asplenia, CSF leaks, or cochlear implants are recommended to receive a dose of PCV13 followed by a dose of PPSV23.

- a. Pneumococcal vaccine-naïve persons ages ≥19 years that have not previously received PCV13 or PPSV23, should receive a dose of PCV13. At least 8 weeks later, a second dose of PPSV23 should be administered. Following doses of PPSV23 should be administered according to the current PPSV23 recommendations for adults at high risk. Additionally, 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 elapsed since their previous PPSV23 dose.

- b. Individuals previously vaccinated with PPSV23 ages  $\geq 19$  who previously have received  $\geq 1$  doses of PPSV23 should be given a PCV13 dose at least one year after the last PPSV23 dose was received. For those who require additional doses of PPSV23, the first such dose should be given no sooner than 8 weeks after PCV13 and at least 5 years after the most recent dose of PPSV23.

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 Advisory Committee on Immunization Practices (ACIP) guidelines or local preventive medicine guidance for disease outbreak prevention. Active duty personnel  $< 50$  years of age still must provide informed consent to receive PCV13 vaccine until ages  $\geq 19$  ACIP recommendation is included in PCV13 package insert.

### 3. References:

- a. Centers for Disease Control and Prevention. Use of 13-Valent Pneumococcal Conjugate Vaccine and 23-Valent Pneumococcal Polysaccharide Vaccine for Adults aged 65 and older: Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2014; 63 (37): 822-825.
- b. Centers for Disease Control and Prevention. Use of 13-Valent Pneumococcal Conjugate Vaccine and 23-Valent Pneumococcal Polysaccharide Vaccine for Adults with Immunocompromising Conditions: Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2012; 61 (40): 816-819.
- c. 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-11):1-18.
- d. Multiple resources (e.g., products insert, Vaccine Information Statements) assembled by Defense Health Agency Immunization Healthcare:  
[www.health.mil/pneumococcal](http://www.health.mil/pneumococcal).

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