caused by these serotypes is uncertain. In the United States, however, serotypes 1 and 5 are relatively uncommon causes of IPD.

Although rates of pneumonia hospitalizations decreased after PCV7 introduction among children aged <2 years,[10] the potential effects of PCV13 on noninvasive disease, such as nonbacteremic pneumonia and otitis media, are difficult to evaluate because of lack of standard case definitions, sensitive and specific diagnostic methods, and routine surveillance for these conditions. Information on these noninvasive pneumococcal diseases is not available in the ABCs dataset. Because PCV13 was licensed on the basis of immunogenicity studies rather than clinical efficacy trials, post-licensure monitoring is important to characterize the effectiveness of PCV13 in different populations and to track the potential changes in disease burden caused by non-PCV13 serotypes.

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REFERENCES

1. CDC. Preventing pneumococcal disease among infants and young children: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR*. 2000;49(RR-9).
2. Pilishvili T, Lexau C, Farley MM, et al; Active Bacterial Core Surveillance/Emerging Infections Program Network. Sustained reductions in invasive pneumococcal disease in the era of conjugate vaccine. *J Infect Dis*. 2010;201(1):32-41.
3. CDC. Licensure of a 13-valent pneumococcal conjugate vaccine (PCV13) and recommendations for use among children—Advisory Committee on Immunization Practices (ACIP), 2010. *MMWR*. 2010;59 (9):258-261.
4. CDC. Invasive pneumococcal disease in children 5 years after conjugate vaccine introduction—eight states, 1998-2005. *MMWR*. 2008;57(6): 144-148.
5. Kieninger DM, Kueper K, Steul K, et al. Safety and immunologic non-inferiority of 13-valent pneumococcal conjugate vaccine compared to 7-valent pneumococcal conjugate vaccine given as a 4-dose series with routine vaccines in healthy infants and toddlers. In: Proceedings of the 48th Annual Interscience Conference on Antimicrobial Agents and Chemotherapy; October 25-28, 2008; Washington, DC. Arlington, VA: Infectious Diseases Society of America; 2008.
6. Pelton SI, Huot H, Finkelstein JA, et al. Emergence of 19A as virulent and multidrug resistant pneumococcus in Massachusetts following universal immunization of infants with pneumococcal conjugate vaccine. *Pediatr Infect Dis J*. 2007;26(6):468-472.
7. Kaplan SL, Barson WJ, Lin PL, et al. Serotype 19A is the most common serotype causing invasive pneumococcal infections in children. *Pediatrics*. 2010; 125(3):429-436.
8. CDC. Direct and indirect effects of routine vaccination of children with 7-valent pneumococcal conjugate vaccine on incidence of invasive pneumococcal disease—United States, 1998-2003. *MMWR*. 2005; 54(36):893-897.
9. Hausdorff WP, Feikin DR, Klugman KP. Epidemiological differences among pneumococcal serotypes. *Lancet Infect Dis*. 2005;2:83-93.
10. CDC. Pneumonia hospitalizations among young children before and after introduction of pneumococcal conjugate vaccine—United States, 1997-2006. *MMWR*. 2009;58:1-4.

*Available at http://www.cdc.gov/abcs/index.html.

Licensure of a 13-Valent Pneumococcal Conjugate Vaccine (PCV13) and Recommendations for Use Among Children—Advisory Committee on Immunization Practices (ACIP), 2010

MMWR. 2010;59:258-261

3 tables omitted

ON FEBRUARY 24, 2010, A 13-VALENT pneumococcal conjugate vaccine (PCV13 [Prevnar 13, Wyeth Pharmaceuticals Inc., a subsidiary of Pfizer Inc.]) was licensed by the Food and Drug Administration (FDA) for prevention of invasive pneumococcal disease (IPD) caused by the 13 pneumococcal serotypes covered by the vaccine and for prevention of otitis media caused by serotypes in the 7-valent pneumococcal conjugate vaccine formulation (PCV7 [Prevnar, Wyeth]). PCV13 is approved for use among children aged 6 weeks–71 months and succeeds PCV7, which was licensed by FDA in 2000. The Pneumococcal Vaccines Work Group of the Advisory Committee on Immunization Practices (ACIP) reviewed available data on the immunogenicity, safety, and cost-effectiveness of PCV13, and on estimates of the vaccine-preventable pneumococcal disease burden. The working group then presented policy options for consideration of the full ACIP. This report summarizes recommendations approved by ACIP on February 24, 2010, for (1) routine vaccination of all children aged 2-59 months with PCV13, (2) vaccination with PCV13 of children aged 60-71 months with underlying medical conditions that increase their risk for pneumococcal disease or complications, and (3) PCV13 vaccination of children who previously received 1 or more doses of PCV7.[1] CDC guidance for vaccination providers regarding transition from PCV7 to the PCV13 immunization program also is included.

Prevnar 13 Licensure

Vaccine Formulation

PCV13 contains polysaccharides of the capsular antigens of *Streptococcus pneumoniae* serotypes 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, and 23F, individually conjugated to a nontoxic diphtheria CRM_{197} (CRM, cross-reactive material) carrier protein. A 0.5-mL PCV13 dose contains approximately 2 μg of polysaccharide from each of 12 serotypes and approximately 4 μg of polysaccharide from serotype 6B; the total concentration of CRM_{197} is approximately 34 μg. The vaccine contains 0.125 mg of aluminum as aluminum phosphate adjuvant and no thimerosal preservative. PCV13 is administered intramuscularly and is available in single-dose, prefilled syringes that do not contain latex.[2]

Immunogenicity Profile

The immunogenicity of PCV13 was evaluated in a randomized, double-blind, active-controlled trial in which 663 U.S. infants received at least 1 dose of PCV13 or PCV7.[3] To compare PCV13 antibody responses with those for PCV7, criteria for noninferior immunogenicity after 3 and 4 doses of PCV13 (pneumococcal immunoglobulin G [IgG] antibody concentrations measured by enzyme immuno-

assay) were defined for the seven serotypes common to PCV7 and PCV13 (4, 6B, 9V, 14, 18C, 19F, and 23F) and for the six additional serotypes in PCV13 (serotypes 1, 3, 5, 6A, 7F, and 19A). Functional antibody responses were measured by opsonophagocytosis assay (OPA) in a subset of the study population. Evaluation of these immunologic parameters indicated that PCV13 induced levels of antibodies that were comparable to those induced by PCV7 and shown to be protective against IPD.[3]

Among infants receiving the 3-dose primary series, responses to three PCV13 serotypes (the shared serotypes 6B and 9V, and new serotype 3) did not meet the prespecified, primary endpoint criterion (percentage of subjects achieving an IgG seroresponse of ≥0.35 μg/mL 1 month after the third dose); however, detectable OPA antibodies to each of these three serotypes indicated the presence of functional antibodies.[3] The percentages of subjects with an OPA titer ≥1:8 were similar for the seven common serotypes among PCV13 recipients (range: 90%-100%) and PCV7 recipients (range: 93%-100%); the proportion of PCV13 recipients with an OPA titer ≥1:8 was >90% for all of the 13 serotypes.[3]

After the fourth dose, the IgG geometric mean concentrations (GMCs) were comparable for 12 of the 13 serotypes; the noninferiority criterion was not met for serotype 3. However, measurable OPA titers were present for all serotypes after the fourth dose; the percentage of PCV13 recipients with an OPA titer ≥1:8 ranged from 97% to 100% for the 13 serotypes and was 98% for serotype 3.[3]

A schedule of 3 doses of PCV7 followed by 1 dose of PCV13 resulted in somewhat lower IgG GMCs for the six additional serotypes compared with a 4-dose PCV13 series. However, the OPA responses after the fourth dose were comparable for the two groups, and the clinical relevance of these lower antibody responses is not known. The single dose of PCV13 among children aged ≥12 months who had received 3 doses of PCV7 elicited IgG immune responses to the six additional serotypes that were comparable to those after a 3-dose infant PCV13 series.[3]

Safety Profile

The safety of PCV13 was assessed in 13 clinical trials in which 4,729 healthy infants and toddlers were administered at least 1 dose of PCV13 and 2,760 children received at least 1 dose of PCV7, concomitantly with other routine pediatric vaccines. The most commonly reported (more than 20% of subjects) solicited adverse reactions that occurred within 7 days after each dose of PCV13 were injection-site reactions, fever, decreased appetite, irritability, and increased or decreased sleep.[2] The incidence and severity of solicited local reactions at the injection site (pain/tenderness, erythema, and induration/swelling) and solicited systemic reactions (irritability, drowsiness/increased sleep, decreased appetite, fever, and restless sleep/decreased sleep) were similar in the PCV13 and PCV7 groups. These data suggest that the safety profiles of PCV13 and PCV7 are comparable[2]; CDC will conduct postlicensure monitoring for adverse events, and the manufacturer will conduct a Phase IV study.

Supportive data for safety outcomes were provided by a catch-up study among 354 children aged 7-71 months who received at least 1 dose of PCV13. In addition, an open label study was conducted among 284 healthy U.S. children aged 15-59 months who had previously received 3 or 4 doses of PCV7.[2] Among these children, the frequency and severity of solicited local reactions and systemic adverse reactions after 1 dose of PCV13 were comparable to those among children receiving their fourth dose of PCV13.[2]

Indications and Guidance for Use

ACIP recommends PCV13 for all children aged 2-59 months. ACIP also recommends PCV13 for children aged 60-71 months with underlying medical conditions that increase their risk for pneumococcal disease or complications.

No Previous PCV7/PCV13 Vaccination

The ACIP recommendation for routine vaccination with PCV13 and the immunization schedules for infants and toddlers through age 59 months who have not received any previous PCV7 or PCV13 doses are the same as those previously published for PCV7.[4,5] PCV13 is recommended as a 4-dose series at ages 2, 4, 6, and 12-15 months. Infants receiving their first dose at age ≤6 months should receive 3 doses of PCV13 at intervals of approximately 8 weeks (the minimum interval is 4 weeks). The fourth dose is recommended at age 12-15 months, and at least 8 weeks after the third dose.

Children aged 7-59 months who have not been vaccinated with PCV7 or PCV13 previously should receive 1 to 3 doses of PCV13, depending on their age at the time when vaccination begins and whether underlying medical conditions are present. Children aged 24-71 months with chronic medical conditions that increase their risk for pneumococcal disease should receive 2 doses of PCV13. Interruption of the vaccination schedule does not require reinstitution of the entire series or the addition of extra doses.

Incomplete PCV7/PCV13 Vaccination

Infants and children who have received 1 or more doses of PCV7 should complete the immunization series with PCV13. Children aged 12-23 months who have received 3 doses of PCV7 before age 12 months are recommended to receive 1 dose of PCV13, given at least 8 weeks after the last dose of PCV7. No additional PCV13 doses are recommended for children aged 12-23 months who received 2 or 3 doses of PCV7 before age 12 months and at least 1 dose of PCV13 at age ≥12 months.

Similar to the previous ACIP recommendation for use of PCV7,[6] 1 dose of PCV13 is recommended for all healthy children aged 24-59 months with any incomplete PCV schedule (PCV7 or PCV13). For children aged 24-71 months with underlying medical conditions who have received any incomplete schedule of <3 doses of PCV (PCV7 or PCV13) before age 24 months, 2 doses of PCV13 are recommended. For children with underlying medical conditions who have received 3 doses of PCV (PCV7 or PCV13) a single dose of PCV13 is recommended through age 71 months. The minimum interval between doses is 8 weeks.

Complete PCV7 Vaccination

A single supplemental dose of PCV13 is recommended for all children aged 14-59 months who have received 4 doses of PCV7 or another age-appropriate, complete PCV7 schedule. For children who have underlying medical conditions, a single supplemental PCV13 dose is recommended through age 71 months. This includes children who have previously received the 23-valent pneumococcal polysaccharide vaccine (PPSV23). PCV13 should be given at least 8 weeks after the last dose of PCV7 or PPSV23.

In addition, a single dose of PCV13 may be administered to children aged 6-18 years who are at increased risk for IPD because of sickle cell disease, human immunodeficiency virus (HIV) infection or other immunocompromising condition, cochlear implant, or cerebrospinal fluid leaks, regardless of whether they have previously received PCV7 or PPSV23. Routine use of PCV13 is not recommended for healthy children aged ≥5 years.

Precautions and Contraindications

Before administering PCV13, vaccination providers should consult the package insert for precautions, warnings, and contraindications. Vaccination with PCV13 is contraindicated among persons known to have severe allergic reaction (e.g., anaphylaxis) to any component of PCV13 or PCV7 or to any diphtheria toxoid-containing vaccine.[2]

Transition From PCV7 to PCV13

When PCV13 is available in the vaccination provider's office, unvaccinated children and children incompletely vaccinated with PCV7 should complete the immunization series with PCV13. If the only pneumococcal conjugate vaccine available in a provider's office is PCV7, that vaccine should be provided to children and infants who are due for vaccination; these children should complete their series with PCV13 at subsequent visits. Children for whom the supplemental PCV13 dose is recommended should receive it at their next medical visit, at least 8 weeks after the last dose of PCV7.

According to the manufacturer, supplies of PCV13 should be adequate to allow providers to vaccinate children according to the routine immunization schedule and provide a supplemental dose as recommended. For private vaccine supplies, providers should contact Pfizer's customer service department (telephone, 800-666-7248) with questions about purchasing quantities of PCV13 or returning PCV7 for credit. For public vaccine supplies, including Vaccines for Children Program vaccine, providers should contact their state/local immunization program to determine when PCV13 will become available for ordering in their jurisdiction and what to do with unused supplies of PCV7.

The PCV13 Vaccine Information Statement is available at http://www.cdc.gov/vaccines/pubs/vis/default.htm. Details about the routine pneumococcal conjugate vaccination schedule are available at http://www.cdc.gov/vaccines/recs/schedules/default.htm#child. Adverse events after receipt of any vaccine should be reported to the Vaccine Adverse Event Reporting System at http://vaers.hhs.gov.

REFERENCES

6 Available.

Malaria Acquired in Haiti—2010

MMWR. 2010;59:217-219

1 box omitted

ON JANUARY 12, 2010, A 7.0 MAGNITUDE earthquake struck Haiti, which borders the Dominican Republic on the island of Hispaniola. The earthquake's epicenter was 10 miles west of the Haiti capital city of Port-au-Prince (estimated population: 2 million). According to the Haitian government, approximately 200,000 persons were killed, and 500,000 were left homeless.[1] Malaria caused by *Plasmodium falciparum* infection is endemic in Haiti, and the principal mosquito vector is *Anopheles albimanus*, which frequently bites outdoors. Thus, displaced persons living outdoors or in temporary shelters and thousands of emergency responders in Haiti are at substantial risk for malaria. During January 12 –February 25, CDC received reports of 11 laboratory-confirmed cases of *P. falciparum* malaria acquired in Haiti. Patients included seven U.S. residents who were emergency responders, three Haitian residents, and one U.S. traveler. This report summarizes the 11 cases and provides chemoprophylactic and additional preventive recommendations to minimize the risk for acquiring malaria for persons traveling to Haiti.

Of the seven emergency responders, six were U.S. military personnel. Among the six, four cases were uncomplicated and treated locally in Haiti. Two other patients were moderately to seriously ill and transferred to the United States for intensive care; one required intubation and mechanical ventilation for acute respiratory distress syndrome. All are expected to make a full recovery.

All six military personnel had been provided oral chemoprophylaxis with doxycycline before departure from the United States and personal protective equipment (e.g., insect repellent and insecticide-treated netting and uniforms) after arrival in Haiti. Of the 11 total patients, chemoprophylaxis was indicated for the seven emergency responders and the lone U.S. traveler. Six of these eight patients (including the two hospitalized military personnel) reported nonadherence to the recommended malaria medication regimen. Adherence status was unknown for the remaining two patients.

Three cases occurred in Haitian residents who traveled to the United States, including one Haitian adoptee. The number of U.S. malaria cases imported from Haiti likely is underestimated because typically not all cases are reported to CDC.

Reported by: K Mung, MD, B Renamy, MSc, Pan American Health Organization. JF Vely, MD, R Magloire MD, Ministry of Public Health and Population, Haiti. N Wells, MD, US Navy Medical Corps, J Ferguson, DO, US Army Medical Corps. D Townes, MD, M McMorrow, MD, K Tan, MD, B Divine, L Slutsker, MD, Malaria Br, Div of Parasitic Diseases, Center for Global Health, CDC.