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## Pneumococcal Vaccination for Cochlear Implant Candidates and Recipients: Updated Recommendations of the Advisory Committee on Immunization Practices

In October 2002, CDC recommended that all persons with cochlear implants receive age-appropriate pneumococcal vaccination with 7-valent pneumococcal conjugate vaccine (PCV7) (Pneumovax<sup>®</sup>), 23-valent pneumococcal polysaccharide vaccine (PPV23) (Pneumovax<sup>®</sup>), or both according to the Advisory Committee on Immunization Practices (ACIP) schedules for persons at high risk (1). CDC issued these recommendations on the basis of preliminary data suggesting an increased risk for pneumococcal meningitis in persons with cochlear implants. Findings of a recent investigation by CDC, the Food and Drug Administration (FDA), and state health departments support this recommendation. Children aged <6 years with a cochlear implant had a substantially greater risk for having pneumococcal meningitis, compared with children in the general U.S. population of the same age (2). Some children who are candidates for cochlear implants have pre-existing anatomic factors that might contribute to an increased risk for meningitis; however, the recent study was not designed to assess this association (2).

Because the rate for pneumococcal meningitis is higher in children with cochlear implants and *Streptococcus pneumoniae*

is the most common pathogen causing bacterial meningitis in cochlear implant recipients of all ages with meningitis of known etiology (2,3), ACIP recommends the following for persons who have or are scheduled to receive a cochlear implant (Table):

- Children with cochlear implants aged <24 months should receive PCV7, as is universally recommended; children with a lapse in vaccination should be vaccinated according to the catch-up schedule issued after the PCV7 short-age resolved (4,5).
- Children aged 24–59 months with cochlear implants who have not received PCV7 should be vaccinated according to the high-risk schedule; children with a lapse in vaccination should be vaccinated according to the catch-up schedule for persons at high risk issued after the PCV7 shortage resolved (3,4). Children who have completed the PCV7 series should receive PPV23  $\geq 2$  months after vaccination with PCV7 (3).
- Persons aged 5–64 years with cochlear implants should receive PPV23 according to the schedule used for persons with chronic illnesses; a single dose is indicated (6).

TABLE. Recommended pneumococcal vaccination schedule for persons with cochlear implants, Advisory Committee on Immunization Practices, 2003

Age at first PCV7 dose (mos)*	PCV7 primary series	PCV7 additional dose	PPV23 dose
2–6	3 doses, 2 months apart <sup>†</sup>	1 dose at 12–15 months of age <sup>§</sup>	Indicated at $\geq 24$ months of age <sup>¶</sup>
7–11	2 doses, 2 months apart <sup>†</sup>	1 dose at 12–15 months of age <sup>§</sup>	Indicated at $\geq 24$ months of age <sup>¶</sup>
12–23	2 doses, 2 months apart <sup>**</sup>	Not indicated	Indicated at $\geq 24$ months of age <sup>¶</sup>
24–59	2 doses, 2 months apart <sup>**</sup>	Not indicated	Indicated <sup>¶</sup>
$\geq 60$	Not indicated <sup>††</sup>	Not indicated <sup>††</sup>	Indicated

\* A schedule with a reduced number of total 7-valent pneumococcal conjugate vaccine (PCV7) doses is indicated if children start late or are incompletely vaccinated. Children with a lapse in vaccination should be vaccinated according to the catch-up schedule (CDC. Pneumococcal conjugate vaccine shortage resolved. MMWR 2003;52:446–7).

<sup>†</sup> For children vaccinated at age <1 year, minimum interval between doses is 4 weeks.

<sup>§</sup> The additional dose should be administered  $\geq 8$  weeks after the primary series has been completed.

<sup>¶</sup> Children aged <5 years should complete the PCV7 series first; 23-valent pneumococcal polysaccharide vaccine (PPV23) should be administered to children aged  $\geq 24$  months  $\geq 8$  weeks after the last dose of PCV7 (CDC. Preventing pneumococcal disease among infants and young children: recommendations of the Advisory Committee on Immunization Practices. MMWR 2000;49(No. RR-9).

<sup>\*\*</sup> Minimum interval between doses is 8 weeks.

<sup>††</sup> PCV7 is not recommended generally for children aged  $\geq 5$  years.

- Persons planning to receive a cochlear implant should be up-to-date on age-appropriate pneumococcal vaccination  $\geq 2$  weeks before surgery, if possible.

Health-care providers should review vaccination records of their patients who are cochlear implant recipients or candidates to ensure that they have received pneumococcal vaccinations based on the age-appropriate schedules for persons at high risk. In addition, all cases of meningitis should be reported to state health departments according to state requirements. Because information about *Streptococcus pneumoniae* serotypes causing pneumococcal meningitis in persons with cochlear implants is limited, providers are encouraged to send isolates to their state health department, which can forward isolates to CDC, where serotyping can be performed to determine whether the type is included in the vaccines.

To send an isolate, contact CDC's National Center for Infectious Diseases, telephone 404-639-2215. Providers also are encouraged to report cases of meningitis in cochlear implant recipients to FDA's MedWatch. Reports can be submitted

online at <http://www.accessdata.fda.gov/scripts/medwatch>; by telephone, 800-332-1088; by fax, 800-332-0178; or by mail, MedWatch, Food and Drug Administration, HF-2, 5600 Fishers Lane, Rockville, Maryland 20857. Cases also can be reported directly to the device manufacturer.

#### References

1. CDC. Pneumococcal vaccination for cochlear implant recipients. MMWR 2002;51:931.
2. Reefhuis J, Honein MA, Whitney CG, et al. Risk of bacterial meningitis in children with cochlear implants, USA 1997–2002. N Engl J Med 2003;349:433–43.
3. U.S. Food and Drug Administration. Public health web notification: cochlear implant recipients may be at greater risk for meningitis. Available at <http://www.fda.gov/cdrh/safety/cochlear.html>.
4. CDC. Preventing pneumococcal disease among infants and young children: recommendations of the Advisory Committee on Immunization Practices. MMWR 2000;49(No. RR-9).
5. CDC. Pneumococcal conjugate vaccine shortage resolved. MMWR 2003;52:446–7.
6. CDC. Prevention of pneumococcal disease: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1997;46(No. RR-8).

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