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OREGON PUBLIC HEALTH DIVISION • OREGON HEALTH AUTHORITY

PCV13: TAKING IT TO THE PNEUMOCOCCUS

In June 2011, a two-year-old California girl died of invasive pneumococcal disease (IPD) caused by serotype 19A, one of six serotypes unique to the new 13-valent pneumococcal conjugate vaccine (PCV13, Prevnar 13®). The child had received three doses of the 7-valent pneumococcal conjugate vaccine (PCV7), but had not received the supplemental dose of PCV13 as recommended by the Advisory Committee on Immunization Practices (ACIP).[1] Upon further investigation, the California Department of Public Health identified 30 more PCV13- eligible children who had developed nonfatal IPD caused by PCV13 serotypes not covered by PCV7.

UNDERVACCINATION

In light of these cases, the federal Centers for Disease Control and Prevention (CDC) investigated the uptake of PCV13 among children throughout the United States. With data from the PCV13 vaccine effectiveness evaluation,[2] CDC identified 135 cases of IPD caused by one of the six serotypes covered by PCV13 but not by PCV7 among children <60 months of age. Of these cases, 63 children, 43 (68%) of them 2–4 years of age, had been eligible for PCV13 vaccination. Thirty-nine (62%) of the 63 children had been completely vaccinated with PCV7 but had not received the recommended supplemental dose of PCV13. Data from the Immunization Information System (IIS) sentinel sites further indicated that among children with age-appropriate, complete primary PCV7 series, the proportion that had received the PCV13 supplemental dose was low (37%).[1,3] Regardless of PCV7 series completion, older children were less likely than younger children to have received PCV13.

Given the potential for missed opportunities for vaccination with PCV13, **healthcare providers should recommend PCV13 vaccination for all age-eligible patients during opportune medical encounters**.[1]

In this issue of the *CD Summary*, we review the epidemiology of IPD in Oregon, the uptake of PCV13 in the State, and ACIP vaccination recommendations.

IPD EPIDEMIOLOGY

IPD* is a severe, acute infection caused by the bacterium *Streptococcus pneumoniae.* The most common presentations of IPD are pneumonia, bacteremia, meningitis, otitis media, and sinusitis. In the United States, this bacterium causes an estimated 44,000 cases of IPD and 5,000 deaths annually.[4] Approximately 4,000 cases of IPD, mostly bacteremia and meningitis, occur in children <5 years old.

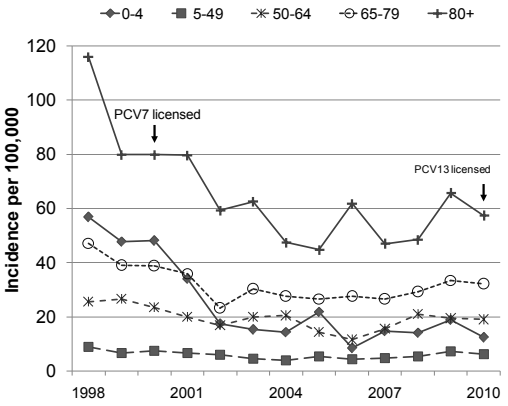
In Oregon, IPD is monitored by the Active Bacterial Core surveillance (ABCs) program, which conducts active, laboratory-based surveillance for invasive disease due to eight pathogens, including *Streptococcus pneumoniae*, primarily in the three counties (Clackamas, Multnomah and Washington) of the Portland metropolitan area.

In 2010, 208 cases of IPD were reported in this Portland Tri-County area, yielding an incidence of 12.7/100,000 persons. The incidence was highest in those ≥80 years of age (29 cases; 57.3/100,000), followed by those 65–79 years of age and those 50–64 years of age (Figure 1). The overall incidence in 2010 was 40% lower than that in 1998, 2 years prior to the licensure of PCV7.

While rates of IPD caused by the 7 pneumococcal serotypes in the PCV7 vaccine have declined dramatically following its introduction in 2000, rates of IPD caused by some serotypes (3, 7F, 19A) not included in PCV7 have increased. In Oregon, 54% of IPD cases in 2010 were due to serotypes 7F (32%), 19A (13%) and 3 (9%). Since 2003, serotype 7F IPD increased from 0.5 to 3.8 per 100,000; serotype 19A increased from 0.7 to 1.6; and serotype 3 increased from 0.9 to 1.1. Fortunately, PCV13 (licensed by the U.S. Food and Drug Administration [FDA] in February 2010) includes these three serotypes (Table, *verso*).

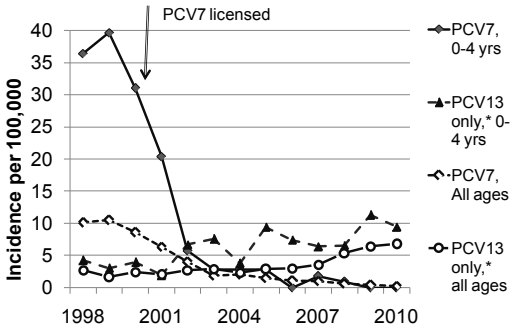
* Invasive pneumococcal disease is defined as isolation of *Streptococcus pneumoniae* from a normally sterile body site (e.g. blood, cerebrospinal fluid, pleural fluid, peritoneal fluid, joint fluid).

Figure 1. Incidence of IPD by age group and year, Portland Tri-County Area, 1998–2010



From 1998 to 2010, the incidence of IPD caused by PCV7 serotypes decreased 97% overall, and the decrease was most pronounced among children <5 years of age (Figure 2). During the same period the incidence of IPD due to the six additional serotypes now covered by PCV13 increased almost 150%.

Figure 2. Incidence of IPD by age group and vaccine serotype, Portland Tri-County Area,



*Includes only the 6 strains covered by PCV13 but not by PCV7

PCV13 UPTAKE IN OREGON

As a participating site in the aforementioned CDC PCV13 vaccine effectiveness evaluation (estimatedcompletion in

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2015), Oregon has identified 11 cases of IPD in children 2–59 months of age who reside in the Portland Tri-County surveillance area; nine of these had isolates available for serotyping. Four were serotypes not covered by either vaccine. Five, however, were serotypes covered by PCV13 but not by PCV7; of these five, two were too young for the supplemental dose, and three could have received (but didn't) the recommended PCV13 dose.

According to Oregon ALERT Immunization Registry data, of the children who were up-to-date on PCV7 before the introduction of PCV13 and were 24–59 months of age at its introduction, only 27% have received the supplemental PCV13 dose. Among those 12–23 months of age at the time of PCV13's introduction, 52% have received an additional PCV13 dose. The older children were less likely to receive the supplemental dose.

GET VACCINATED!

PCV13 replaces PCV7 in the routine 4-dose series given at 2, 4, 6, and 12–15 months of age. A single dose of PCV13 is recommended for selected children, even if they have already completed the PCV7 series. **PCV7 should no longer be used at this time; use PCV13.**

Table. Pneumococcal conjugate vaccine serotypes

Vaccine	FDA Licensure	Serotypes Covered
PCV13	Feb 2010	PCV7 serotypes plus 1, 3, 5, 6A, 7F, 19A
PCV7	Feb 2000	4, 6B, 9V, 14, 18C, 19F, 23F

To protect against all 13 preventable serotypes, ACIP recommends[5] a single *supplemental* dose of PCV13 for:

- children 14–59 months of age who received an age-appropriate series of PCV7;
- children 60–71 months of age with medical conditions that put them at high risk for IPD, including functional or anatomic asplenia and immunocompromising conditions[5]; and
- persons 6–18 years of age with functional or anatomic asplenia, HIV or other immunocompromising conditions, cochlear implants or CSF leaks.

Similar to those in Oregon, national PCV13 vaccination trends also suggest that children 12–23 months of age (58%) are generally getting vaccinated with PCV13. Toddlers (24–59 months of age), however, are often missing the PCV13 dose: only 32% of toddlers had received the supplemental PCV13 dose compared with 58% of children aged 12–23 months.[1] To increase PCV13 coverage, healthcare providers are urged to take advantage of opportunities to give the PCV13 supplemental dose to eligible patients who present for any reason.[1]

FOR MORE INFORMATION

- Oregon's ABCs program, 971-673-1111; http://public.health.oregon.gov/diseasesconditions/communicabledisease/pages/abc.aspx
- Oregon Immunization ALERT; http://public.health.oregon.gov/preventionwellness/vaccinesimmunization/alert/Pages/index.aspx
- ACIP-recommended immunization schedules 2011; www.cdc.gov/vaccines/recs/schedules/

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5 CDC. Licensure of a 13-valent pneumococcal conjugate vaccine (PCV13) and recommendations for use among children (ACIP). MMWR 2010; 59:258–61. Available at: www.cdc.gov/mmwr/pdf/wk/mm5909.pdf. Accessed 17 Nov 2011.

Influenza Update

Flu activity remains low across the nation. Since October 1, five specimens sent to the Oregon State Public Health Lab have tested positive for influenza; all have proved to be influenza A/H3. Only two lab-confirmed hospitalizations have been reported in the Portland metro area so far this season, and <1% of provider visits have been for influenza-like illnesses.

To date this season, CDC has characterized 12 viruses antigenically. Eleven were A/Perth/16/2009-like viruses, and 1 was B/Victoria; both of these are components of the vaccine for the 2011–2012 season. It's not too late to get vaccinated—influenza might not remain complacent for long!