PCV13 vs PPSV23: Which to Give and When
Primary Care Case Conference

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Objectives

• Understand the indications for adults for PPSV23 (Pneumovax)
• Understand the indications for adults for PCV13 (Prevnar)
• Know which vaccine to give and when
• No disclosures
ACIP January 2013
Updated Immunization Guidelines

- 13-valent pneumococcal conjugate vaccine (PCV13) recommended for adults with immunocompromising conditions (including chronic renal failure and nephrotic syndrome), functional or anatomic asplenia, cerebrospinal fluid leaks, or cochlear implants.

- Adults aged 65 years or older should now receive the tetanus, diphtheria, and acellular pertussis (Tdap) vaccine, as should pregnant women during 27 to 36 weeks’ gestation for each pregnancy.
ACIP January 2013
Updated Immunization Guidelines

• **Live attenuated influenza** vaccine: will include four strains for the 2013-2014 flu season; one A (H3N2) virus strain; one influenza A (H1N1) virus strain; and two influenza B virus strains.

• A mix of trivalent and **quadrivalent** formulations is expected for the inactivated influenza vaccine.

• Mild allergy to eggs no longer a contraindication; however, persons with this allergy should receive the inactivated influenza vaccine.
Case #1: The Dilemma

• 70 year old man who received his first and only pneumonia vaccine (Pneumovax) at age 65. Medical problems: hypertension and dyslipidemia.
  – Is he due for another pneumonia vaccine?
  – If yes, which vaccine does he need: PPSV23 (Pneumovax) and/or PCV13 (Prevnar) and in what order?
Case #2: The Dilemma

- 65 year old woman on 20 mg of prednisone daily for arthritis; otherwise healthy. She’s never had a pneumonia vaccine.
  - Does she need a pneumonia vaccine?
  - If yes, which vaccine does she need: PPSV23 (Pneumovax) and/or PCV13 (Prevnar) and in what order?
Case #3: The Dilemma

• 71 year old woman who received a pneumonia vaccine (PPSV 23-Pneumovax) at age 59 and 65. Her spleen was removed after a car accident at age 59.
  – Is she due for another pneumonia vaccine?
  – If yes, which vaccine does she need: PPSV23 (Pneumovax) and/or PCV13 (Prevnar) and in what order?
Who Needs the PPSV23 Vaccine Recommendations:

– Adults 65 years of age and older
– Anyone 2 through 64 yo
  • Chronic medical problem, eg. heart disease, lung disease, sickle cell disease, diabetes, alcoholism, cirrhosis, leaks of cerebrospinal fluid or cochlear implant
  • Immunosuppressed, eg. Hodgkin’s disease; lymphoma or leukemia; kidney failure; multiple myeloma; nephrotic syndrome; HIV infection or AIDS; damaged spleen, or no spleen; transplant
  • On immunosuppressive Rx: long-term steroids, certain cancer drugs, radiation therapy
– Adult 19 through 64 yo who is a smoker or has asthma
– Residents of nursing homes or long-term care facilities
Pneumovax (PPSV23)

- .5ml given IM or SQ
- Side effects: sore arm, redness at site, mild systemic symptoms (fever, muscle aches)
- If first dose given before age 65, give one dose at age 65 (wait at least 5 years after previous dose)
- No boosters needed if given at age 65 or older
- **2011**: One time booster in 5 years if 19-64 yo at high risk of pneumococcal infection (e.g., chronic renal failure, nephrotic syndrome, functional or anatomic asplenia, or immunocompromised conditions)
- Maximum 2 doses in a lifetime
QuickStats: Percentage of Adults Aged ≥65 Years Who Had Ever Received a Pneumococcal Vaccination,* by Selected Race/Ethnicity† — National Health Interview Survey, United States, 2000-2011§

Weekly
February 1, 2013 / 62(04);75

* Based on a survey question that asked respondents, "Have you ever had a pneumonia shot? This shot is usually given only once or twice in a person's lifetime and is different from the flu shot. It is also called the pneumococcal vaccine." Unknowns were not included in the denominators when calculating percentages.
Epidemiology of Pneumococcal Infection in Adults

- *Streptococcus pneumoniae* (pneumococcus) remains a leading cause of serious illness, including bacteremia, meningitis, and pneumonia among adults in the United States.
- An estimated 4,000 deaths occur in the United States each year because of *S. pneumoniae*, primarily among adults; 175,000 hospitalizations per year.
- Incidence of invasive disease ranges from 3.8 per 100,000 among person aged 18-34 years to 36.4 per 100,000 among those aged ≥65 years.
Epidemiology of Pneumococcal Infection in Immunocompromised Adults

- Immunocompromised adults at increased risk for invasive pneumococcal disease (IPD)
- For adults aged 18-64 years with hematologic cancer, the rate of IPD in 2010 was 186 per 100,000, and for persons with human immunodeficiency virus (HIV) the rate was 173 per 100,000
Epidemiology of Pneumococcal Infection in Immunocompromised Adults, cont’d

- The routine use of PCV7 in infants and young children resulted in significant reductions in IPD caused by vaccine serotypes in children, and because of indirect effects, also in adults.

- Rates of IPD caused by vaccine serotypes in adults 18 to 64 yo, without HIV, decreased from 6 cases to 1 case per 100,000 during 2000-2007 (MMWR Oct 12, 2012)

- 50% of IPD among immunocompromised adults in 2010 caused by serotypes contained in PCV13, an additional 21% caused by serotypes only contained in PPSV23 (MMWR Oct 12 2012)
Timeline for PCV13

• Approved by FDA and ACIP in 2010 for children aged 6 weeks through 71 months for prevention of invasive pneumococcal disease (IPD)

• Dec 20, 2011 FDA approved PCV13 for prevention of pneumonia and invasive disease caused by PCV13 serotypes among adults 50 yo and older under the Accelerated Approval pathway

• February and June 2012 ACIP meetings critical gaps safety and immunogenicity in this age group noted, necessitating further studies

• ACIP June 2012 meeting approved PCV13 for adults with immunocompromising conditions at high risk for pneumococcal disease
2012 ACIP: Who Needs PCV13 Vaccine

– Adults 19 yo or older with certain medical conditions who have not previously received PCV13. Medical conditions include:

- Cerebrospinal fluid (CSF) leaks
- Cochlear implant(s)
- Sickle cell disease and other hemoglobinopathies
- Functional or anatomic asplenia
- Congenital or acquired immunodeficiencies
- HIV infection
- Chronic renal failure, Nephrotic syndrome
- Leukemia, Hodgkin’s disease, Generalized malignancy
- Long-term immunosuppressive therapy
- Solid organ transplant
- Multiple myeloma
PCV13 (Prevnar)

- 0.5ml given IM in deltoid
- Covers *Streptococcus pneumoniae* serotypes 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, and 23F
- Side effects: pain at injection site (>50%), fatigue (>30%), headache (>20%), muscle pain (>20%), injection site redness (>10%), injection site pain (>10%)
- Comes in a pre-filled syringe that does not contain latex
Which Pneumonia Vaccine to Give

– Adults with one of the above listed conditions who have not received any pneumococcal vaccine:
  • Administer a dose of PCV13 (Prevnar) first and a minimum of 8 weeks later administer the recommended doses of PPSV23 (Pneumovax).

– Adults who have previously received one or more doses of PPSV23, and have one of the above listed conditions:
  • Administer a dose of PCV13 (as long as 1 year since PPSV23) and continue to administer the remaining recommended doses of PPSV23.
PCV13 Recommended for Wide Use in Immunocompromised Adults

Previously Unimmunized Adults Aged 19 years and Older

- A single dose of 13-valent pneumococcal conjugate vaccine (PCV13; Prevnar, Pfizer) AND
- A single dose of pneumococcal polysaccharide vaccine (PPSV23, Pneumovax, Merck) at least 8 weeks later AND
- PPSV23 given 5 or more years later OR
- PPSV23 at age 65
PCV13 Recommended for Wide Use in Immunocompromised Adults

Previously Immunized Adults Aged 19 Years and Older:

• Persons who have previously received 1 or more doses of PPSV23 should receive 1 dose of PCV13, given at least 1 year after the most recent dose of PPSV23.

• For persons who need additional doses of PPSV23 according to previous guidelines, the first such dose should be given at least 8 weeks after PCV13 and at least 5 years after the most recent dose of PPSV23.
Immunization Quality Measures

- Pneumonia vaccination status: percentage of Medicare members 65 years of age and older who have ever received a pneumococcal vaccination

- Where monitored:
  - NCQA:
    - HEDIS® and CAHPS®
  - Joint Commission
  - CMS
  - WCHQ
UW Hospital and Clinics Protocol
Objectives

• External quality measures
  – Maximize performance on Centers for Medicare and Medicaid Services (CMS) Immunization Hospital Quality Measures

• Better Care
  – Ensure patients receive influenza and/or pneumococcal vaccines per the recommendations of the Advisory Committee on Immunization Practices (ACIP)
ACIP Recommendations

- Recommend one or both pneumococcal vaccines for adults with pneumococcal risk factors
- PCV13 and PPSV23 for adults ≥ 19 y.o.
  - Immunocompromising conditions
  - Functional or anatomic asplenia
  - Cochlear implants or cerebrospinal fluid leaks
Inpatient Immunization Delegation Protocol
Revisions

• Pharmacist will assess vaccination history for:
  – Pneumococcal vaccine (PCV13 or PPSV23) in patients aged 5 years and older
• Pneumococcal Vaccine exclusion criteria
  – PCV13 only – immunized with PPSV23 within 12 months
  – PPSV23 only – immunized with PCV13 within 8 weeks
  – General exclusions
    • Patient < 5 y.o.
      – Ordering of PCV13 and PPSV23 for patients < 5 y.o. may be indicated but is not permitted via protocol; physician order required if < 5 y.o.
<table>
<thead>
<tr>
<th>Risk Group</th>
<th>Underlying Medical Condition</th>
<th>PCV13 Recommended First</th>
<th>PPSV23 Recommended</th>
<th>Revaccination After 5 Years</th>
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<tr>
<td>Immunocompetent Persons</td>
<td>Chronic Heart Disease*</td>
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<td>Diabetes mellitus</td>
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<td>Cerebrospinal Fluid Leak</td>
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<td>Alcoholism</td>
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<td>Chronic Liver Disease, Cirrhosis</td>
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<td>Cigarette Smoking</td>
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<td>Persons with Functional or Anatomic Asplenia</td>
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<td>Chronic Renal Failure</td>
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<td>Iatrogenic Immunosuppression</td>
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<td>Solid Organ Transplant</td>
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<td>Multiple Myeloma</td>
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Coding and Coverage

- Medicare began covering pneumonia vaccine in 1981 and will cover a booster dose for high risk if >5 years since previous dose
- Pneumococcal Codes: 90670 (PCV13) and 90732 (PPSV23)
- Admin services using HCPCS codes: G0009
- Dx codes
  - V06.6: flu and pneumococcal administered
  - V03.82: pneumococcal only administered
- Covered under PPACA
- PCV13 is approximately twice the cost of PPSV23
Case #1: The Answer

- 70 year old man who received his first and only pneumonia vaccine (Pneumovax) at age 65. Medical problems: hypertension and dyslipidemia.
  - Is he due for another pneumonia vaccine?
    - No additional pneumonia vaccines needed.
    - He does not have any medical conditions that would put him in the category of needing PCV13.
    - People who are first vaccinated with PPSV23 at age 65 or older only need to receive 1 dose, regardless of their underlying medical conditions.
Case #2: The Answer

• 65 year old woman on 20 mg of prednisone daily for arthritis; otherwise healthy. She’s never had a pneumonia vaccine.
  – Does she need a pneumonia vaccine?
    • Yes, she meets the requirement for both PPV23 (age) and PCV13 (immunosuppressed)
  – If yes, which vaccine does she need: PPV23 (Pneumovax) and/or PCV13 (Prevnar) and in what order?
    • PCV13 to be given first, followed by PPV23 a minimum of eight weeks later
    • No other booster doses needed
Case #3: The Answer

• 71 year old woman who received a pneumonia vaccine (PPV 23-Pneumovax) at age 59 and 65. Her spleen was removed after a car accident at age 59.

  – Is she due for another pneumonia vaccine?
    • Yes. Asplenia is one of the medical conditions for PCV13

  – If yes, which vaccine does she need: PPV23 (Pneumovax) and/or PCV13 (Prevnar) and in what order?
    • Only PCV13. It’s been >1 year since last PPSV23 so can administer now.
    • No additional doses of PPSV23 needed
# Recommended Adult Immunization Schedule—United States - 2013

Note: These recommendations must be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Age Group</th>
<th>19-21 years</th>
<th>22-26 years</th>
<th>27-49 years</th>
<th>50-59 years</th>
<th>60-64 years</th>
<th>≥ 65 years</th>
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<tbody>
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<td>Influenza</td>
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<td>Tetanus, diphtheria, pertussis (Td/Tdap)</td>
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<td>Human papillomavirus (HPV) Female</td>
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<td>Human papillomavirus (HPV) Male</td>
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<td>Zoster</td>
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<td>Measles, mumps, rubella (MMR)</td>
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<td>Pneumococcal 13-valent conjugate (PCV13)</td>
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<td>Hepatitis A</td>
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<td>Hepatitis B</td>
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</tbody>
</table>

*Covered by the Vaccine Injury Compensation Program*

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indication)

No recommendation

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at www.vaers.hhs.gov or by telephone, 800-822-7967. Information on how to file a Vaccine Injury Compensation Program claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382. To file a claim for vaccine injury, contact the U.S. Court of Federal Claims, 717 Madison Place, N.W., Washington, D.C. 20005; telephone, 202-357-6400.

Additional information about the vaccines in this schedule, extent of available data, and contraindications for vaccination is also available at www.cdc.gov/vaccines or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 8:00 a.m. - 8:00 p.m. Eastern Time, Monday - Friday, excluding holidays.

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

The recommendations in this schedule were approved by the Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP), the American Academy of Family Physicians (AAFP), the American College of Physicians (ACP), American College of Obstetricians and Gynecologists (ACOG) and American College of Nurse-Midwives (ACNM).
### Recommended Vaccinations Indicated for Adults Based on Medical and Other Indications

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Indication</th>
<th>Dose/Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza</td>
<td>Pregnancy, Immuno-compromising conditions (excluding human immunodeficiency virus [HIV])</td>
<td>1 dose IV annually</td>
</tr>
<tr>
<td>Tetanus, diphtheria, pertussis (Td/Tdap)</td>
<td>Men who have sex with men (MSM), HIV infection CD4+ T lymphocyte count &gt; 200 cells/µL</td>
<td>1 dose IV or IM annually, 1 dose Tdap each pregnancy</td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Female</td>
<td>3 doses through age 26 yrs</td>
<td>2 doses</td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Male</td>
<td>Men who have sex with men (MSM), chronic liver disease, chronic alcoholism</td>
<td>3 doses through age 26 yrs</td>
</tr>
<tr>
<td>Zoster</td>
<td>1 dose or none at time of exposure</td>
<td>1 dose</td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td>Contraindicated</td>
<td>1 or 2 doses</td>
</tr>
<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
<td>1 or 2 doses</td>
<td></td>
</tr>
<tr>
<td>Pneumococcal 13-valent conjugate (PCV13)</td>
<td>Contraindicated</td>
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</tr>
<tr>
<td>Meningococcal</td>
<td>1 or more doses</td>
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<tr>
<td>Hepatitis A</td>
<td>Contraindicated</td>
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<tr>
<td>Hepatitis B</td>
<td>Contraindicated</td>
<td>3 doses</td>
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</tbody>
</table>

*Covered by the Vaccine Injury Compensation Program

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

No recommendation

These schedules indicate the recommended age groups and medical indications for which administration of currently licensed vaccines is commonly indicated for adults ages 19 years and older, as of January 1, 2013. For all vaccines being recommended on the Adult Immunization Schedule: a vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine's other components are not contraindicated. For detailed recommendations on all vaccines, including those used primarily for travelers or that are issued during the year, consult the manufacturers’ package inserts and the complete statements from the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/pubs/acip-list.htm). Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.
References: Pneumococcal Vaccine

• *Licensure of 13-Valent Pneumococcal Conjugate Vaccine for Adults Aged 50 Years and Older*, MMWR, June 1, 2012, 61(21), p394-395.

• *Prevention of Pneumococcal Disease – Recommendations of the Advisory Committee on Immunization Practices (ACIP)*; MMWR, April 4, 1997; 46 (RR-8)
References: Pneumococcal Vaccine

Updated Recommendations for Prevention of Invasive Pneumococcal Disease Among Adults Using the 23-Valent Pneumococcal Polysaccharide Vaccine (PPSV23); MMWR, Sept 3, 2010; 59(34) 1102-1106

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, CDC; October 12, 2012/61(40):816-819
Recommended Adult Immunization Schedule: 
United States, 2013*; Annals of Internal Medicine, Feb 5, 2013; 158(3) 191-199

Advisory Committee on Immunization Practices (ACIP) Recommended Immunization Schedules for Persons Aged 0 Through 18 Years and Adults Aged 19 Years and Older-United States, 2013; CDC MMWR, January 28, 2013; 62
QUESTIONS?
Case 1:

- No additional pneumonia vaccines needed.
- He does not have any medical conditions that would put him in the category of needing PCV13.
- People who are first vaccinated with PPSV23 at age 65 or older only need to receive 1 dose, regardless of their underlying medical conditions.
Case 2:

- Does she need a pneumonia vaccine?
  - Yes, she meets the requirement for both PPV23 (age) and PCV13 (immunosuppressed)
  - If yes, which vaccine does she need: PPV23 (Pneumovax) and/or PCV13 (Prevnar) and in what order?
    - PCV13 to be given first, followed by PPV23 a minimum of eight weeks later
    - No other booster doses needed
ANSWER KEY

• Case 3:
  – Is she due for another pneumonia vaccine?
    • Yes. Asplenia is one of the medical conditions for PCV13
  – If yes, which vaccine does she need: PPV23 (Pneumovax) and/or PCV13 (Prevnar) and in what order?
    • Only PCV13. it’s been >1 year since last PPSV23 so can administer now.
    • No additional doses of PPSV23 needed