Pneumococcal Disease, caused by Streptococcus pneumoniae, is a serious public health concern. Two vaccines are available to prevent the disease in adults—pneumococcal polysaccharide vaccine (PPSV23) and pneumococcal conjugate vaccine (PCV13).

Knowing which one to give and when to give it can be confusing. What’s more, giving the wrong one at the wrong time can leave your patient unprotected against pneumococcal disease. This article explains when and how to administer these vaccines to adults and presents recommendations from the Advisory Committee on Immunization Practices (ACIP).

PPSV23 vs. PCV13: What’s the difference?
You may recognize PPSV23 as the brand-name drug Pneumovax® 23. This vaccine (which isn’t live) contains purified polysaccharide antigen from 23 different types of pneumococcal bacteria known to cause approximately 95% of all pneumococcal infections and 25% of the most invasive pneumococcal diseases in adults ages 50 and older.

Since 1983, PPSV23 has been recommended for adults ages 65 and older as well as those younger than age 65 who have certain chronic medical conditions or lifestyle factors that increase their risk for serious pneumococcal infection, including chronic heart, lung, or liver disease; diabetes; alcoholism; and smoking.

On the other hand, PCV13 is sold under the brand name Prevnar® 13 and replaces the earlier Prevnar® 7 vaccine. It contains purified polysaccharide antigen from 13 types of pneumococcal bacteria and provides additional protection against 13 serotypes known to be particularly virulent. Since 2014, the Centers for Disease Control and Prevention (CDC) has recommended PCV13 for all adults older than age 65, regardless of health conditions. It also recommends this vaccine for adults ages 19 to 64 who are immunocompromised or asplenic as well as for those with cerebrospinal fluid (CSF) leakage or cochlear implants. Like PPSV23, PCV13 isn’t a live vaccine. It’s given only once and never repeated. (See Comparing PPSV23 and PCV13.)

Recommended vaccination schedule
ACIP recommends giving these vaccines at certain intervals relative to each other. Administering them too close together makes them less effective, leaving patients without adequate protection against pneumonia. You may give PPSV23 or PCV13 at the same time as other vaccines, but be sure to separate both from the zoster vaccine by 4 weeks to preserve efficacy.

In general, for adults younger than age 65, give PCV13 first, followed by PPSV23 in 8 weeks. Because PPSV23 has been available for many years, your patient may have received it already. If he or she received this vaccine first, don’t give PCV13 until 1 year has passed. PPSV23 can be repeated 5 years after the first PPSV23 dose. In contrast, PCV13 is never repeated.

Preferably, PCV13 should be given first in adults ages 65 and older. Regardless of which vaccine was given first to a patient in this age group, separate the two vaccines by at least 1 year. For ACIP’s recommended vaccination schedule based on age and comorbidities, see Recommended immunization schedule.

Nursing considerations
As with any vaccine, keep the “7 rights” in mind when administering PPSV23 or PCV13—right patient;
right time; right vaccine (and diluent); right dosage; right route, needle, and technique; right injection site; and right documentation. The following sections discuss these and other considerations.

**Administration method**
- Give PCV13 I.M. at a dosage of 0.5 mL in the deltoid muscle. According to the manufacturer, you should suspend PCV13 by shaking or rolling it before injection.
- Give PPSV23 in a single 0.5-mL dose either subcutaneously or I.M.

**Contraindications and precautions**
Contraindications for PPSV23 include a previous life-threatening allergic reaction to the vaccine or to any vaccine component. Patients with acute illness should defer vaccination until the illness has resolved. Know that patients with CSF leakage or who are receiving immunocompromising therapies may have a weaker response to the vaccine. Pregnant or breastfeeding women should avoid PPSV23.

Contraindications to PCV13 include a previous severe allergic reaction to any vaccine component, the earlier version of this vaccine (PCV7), or any vaccine containing diphtheria toxoid, such as diphtheria, tetanus, and whooping cough (pertussis) vaccine. Pregnant or breastfeeding women should avoid this vaccine.

**Comparing PPSV23 and PCV13**

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Pneumococcal polysaccharide vaccine (PPSV23). Brand name: Pneumovax® 23</th>
<th>Pneumococcal conjugate vaccine (PCV13) Brand name: Prevnar 13®</th>
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</thead>
<tbody>
<tr>
<td>Intended population</td>
<td>• Adults ages 65 and older</td>
<td>• Adults ages 65 and older, regardless of health status</td>
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<tr>
<td></td>
<td>• Adults younger than age 65 with chronic heart, lung, or liver disease; diabetes; alcoholism; or smoking</td>
<td>• Adults ages 19 and older who are immunocompromised, asplenic, or have cochlear implants or cerebrospinal fluid (CSF) leakage</td>
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<tr>
<td>Revaccination</td>
<td>• Adults who receive PPSV23 before age 65 should get a second dose 5 years after the first dose (except for those with CSF leakage or cochlear implants). They shouldn’t receive second dose within 1 year of PCV13.</td>
<td>• Adults who receive PCV13 vaccine at any age never require a second dose.</td>
</tr>
<tr>
<td></td>
<td>• Adults ages 65 and older who receive first dose don’t need to be revaccinated.</td>
<td></td>
</tr>
<tr>
<td>Administration</td>
<td>• Give subcutaneously or I.M. (preferred) in deltoid with 1” to 1½” 22-25G needle.</td>
<td>• Give I.M. in deltoid or anterolateral thigh with 1” to 1½” 22-25G needle.</td>
</tr>
<tr>
<td>Contraindications</td>
<td>• Don’t give if patient has had previous life-threatening reaction.</td>
<td>• Don’t give if patient has had previous severe reaction to Prevnar 7® or to diphtheria, tetanus, and whooping cough (pertussis) vaccine.</td>
</tr>
<tr>
<td></td>
<td>• Defer if patient is acutely ill, pregnant, or breastfeeding.</td>
<td>• Defer if patient is acutely ill, pregnant, or breastfeeding.</td>
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</table>

Adults receiving PCV13 have reported redness, pain, and swelling at the injection site, as well as mild fever, fatigue, headache, chills, and muscle pain.

**Patient teaching**
Before administering either vaccine, inform patients about the risks of pneumonia, benefits of the vaccine, and risks and contraindications for the vaccine. Inform them they may experience pain and swelling at the injection site; advise them to use ice to reduce swelling.

Teach patients that vaccinations may not offer complete protection against pneumococcal bacteria. Provide them with vaccine information statements, available without charge on the CDC website (cdc.gov/vaccines/hcp/vis). Report severe reactions to the Health and Human Services Vaccine Adverse Event Reporting System at vaers.hhs.gov.
Nurses’ crucial role

Although a serious public health concern, pneumococcal disease is preventable with the two safe, highly effective vaccines discussed in this article. Be sure you know which patients to give the vaccines to and in what order. Remember—as a nurse, you play an important role in vaccinating patients and educating the public on the risks of not getting vaccinated.

For more information about vaccines, visit ANA Immunize at anaimmunize.org.

Visit AmericanNurseToday.com/?p=24500 to test your knowledge and skills related to pneumococcal vaccines.

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Selected references

Wexler D. Know the “7 rights” of vaccine administration. Immunization Action Coalition. November 2014. immunize.org/technically-speaking/20141101.asp
Test your skills

1. A 48-year-old woman with diabetes but no other health conditions comes to your family practice clinic to adjust her insulin dose. She received her annual flu vaccine at the local health fair. What should you recommend regarding the pneumonia vaccine?
   a. “Get PCV13 now.”
   b. “Don’t get any pneumonia vaccine until you are 65.”
   c. “Get PPSV23 now.”
   d. “Don’t get any vaccines until 8 weeks have passed since you got the flu vaccine.”

2. A 68-year-old man with cardiomyopathy and hypertension comes to a geriatric clinic. He received PPSV23 at age 60 after he was diagnosed with heart disease. Which vaccine should he receive now?
   a. PCV13
   b. A second dose of PPSV23
   c. Only the annual flu vaccine
   d. None, because of his heart condition

3. A 32-year-old woman who is 3 months postpartum and bottle-feeding her infant comes to the family practice clinic. She would like to get the flu vaccine and asks about the pneumonia vaccine she has seen advertised. What would you recommend about the pneumonia vaccine?
   a. “Get PCV13 now.”
   b. “Get PPSV23 now.”
   c. “You don’t need either pneumococcal vaccine now.”
   d. “Get PCV13 now and PPSV23 in 1 year.”

4. A 52-year-old male comes in for his annual primary care visit. Since his last visit, he was in a car accident and ruptured his spleen, which had to be removed. Motivated to take better care of his health, he asks about vaccines. What would you recommend?
   a. “Wait until you are 65 to get the pneumococcal vaccines.”
   b. “Get PCV13 now.”
   c. “Get PCV13 now and PPSV23 when you are 65.”
   d. “Get PCV13 now and PPSV23 in 8 weeks.”

Answers: 1. c; 2. a; 3. c; 4. d