CDC Immunization Update 2015

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Immunization Services Division

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Disclosures

- Donna Weaver is a federal government employee with no financial interest or conflict with the manufacturer of any product named in this presentation.

- The speaker will discuss the off-label use of MMR, HPV, PCV13, and MenB vaccines.

- The speaker will not discuss a vaccine not currently licensed by the FDA.
Disclosures

The recommendations to be discussed are primarily those of the Advisory Committee on Immunization Practices (ACIP):

- Composed of 15 non-government experts in clinical medicine and public health.
- Provides guidance on use of vaccines and other biologic products to DHHS, CDC, and the U.S. Public Health Service.

Next ACIP Meeting
October 21-22, 2015

www.cdc.gov/vaccines/acip/meetings/meetings-info.html
What’s New?

- 2015 Immunization Schedules
- Vaccination Coverage Rates
- VIS Updates
- Measles
- Influenza
- Recent ACIP Recommendations:
  - HPV
  - PCV13
  - MenB
- New Combination Vaccine (DTaP-IPV)
- Vaccine Storage and Handling; Vaccine Administration
- Immunization Resources
Immunization Schedules
Figure 1. Recommended immunization schedule for persons aged 0 through 18 years – United States, 2015.

(For those who fall behind or start late, see the catch-up schedule [Figure 2].)

These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1. To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are shaded.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Birth</th>
<th>1 mo</th>
<th>2 mos</th>
<th>4 mos</th>
<th>6 mos</th>
<th>9 mos</th>
<th>12 mos</th>
<th>15 mos</th>
<th>18 mos</th>
<th>19–23 mos</th>
<th>2–3 yrs</th>
<th>4–6 yrs</th>
<th>7–10 yrs</th>
<th>11–12 yrs</th>
<th>13–15 yrs</th>
<th>16–18 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B (HepB)</td>
<td>1st</td>
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<tr>
<td>Rotavirus (RV) RF1 (2-dose series); RV5 (3-dose series)</td>
<td>1st</td>
<td>2nd</td>
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</tr>
<tr>
<td>Diphtheria, tetanus, &amp; acellular pertussis (DTaP; &lt;7 yrs)</td>
<td>1st</td>
<td>2nd</td>
<td>3rd</td>
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<tr>
<td>Tetanus, diphtheria, &amp; acellular pertussis (Tdap; ≥7 yrs)</td>
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<tr>
<td>Haemophilus influenzae type b (Hib)</td>
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<tr>
<td>Pneumococcal conjugate (PCV13)</td>
<td>1st</td>
<td></td>
<td>2nd</td>
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<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
<td>1st</td>
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<td>3rd</td>
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</tr>
<tr>
<td>Inactivated poliovirus (IPV; &lt;18 yrs)</td>
<td>1st</td>
<td>2nd</td>
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<tr>
<td>Influenza A/V (LAIV): 2 doses for some: See footnote 8</td>
<td>1st</td>
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<tr>
<td>Measles, mumps, rubella (MMR)</td>
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<td></td>
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<td></td>
<td>Annual vaccination (IV only) 1 or 2 doses</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Varicella (VZV)</td>
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<td></td>
<td></td>
<td></td>
<td>Annual vaccination (LAIV or IV) 1 or 2 doses</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Human papillomavirus (HPV2: females only; HPV4: males and females)</td>
<td>1st</td>
<td>2nd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Annual vaccination (LAIV or IV) 1 dose only</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal (Hib-MenACY)</td>
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</tr>
</tbody>
</table>

Range of recommended ages for all children: 1st, 2nd, 3rd
Range of recommended ages for catch-up immunization: 1st, 2nd
Range of recommended ages for certain high-risk groups: 1st, 2nd
Range of recommended ages during which catch-up is encouraged and for certain high-risk groups: 1st, 2nd

This schedule includes recommendations in effect as of January 1, 2015. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at http://www.cdc.gov/vaccines/hcp/acip-recs/index.html. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (http://www.vaers.hhs.gov) or by telephone (800-822-7967). Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for vaccination, is available from CDC online (http://www.cdc.gov/vaccines/recs/vac-admin/contraindications.htm) or by telephone (800-CDC-INF0 (800-232-4636)).

This schedule is approved by the Advisory Committee on Immunization Practices (http://www.cdc.gov/vaccines/acip), the American Academy of Pediatrics (http://www.aap.org), the American Academy of Family Physicians (http://www.aafp.org), and the American College of Obstetricians and Gynecologists (http://www.acog.org).

NOTE: The above recommendations must be read along with the footnotes of this schedule.
FIGURE 2. Catch-up immunization schedule for persons aged 4 months through 18 years who start late or who are more than 1 month behind — United States, 2015.

The figure below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child's age. Always use this table in conjunction with Figure 1 and the footnotes that follow.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Minimum Age for Dose 1</th>
<th>Minimum Interval Between Doses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B</td>
<td>Births</td>
<td>6 weeks 4 weeks &amp; at least 16 weeks after first dose. Minimum age for the final dose is 24 weeks.</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>6 weeks</td>
<td>4 weeks 4 weeks²</td>
</tr>
<tr>
<td>Diphtheria, tetanus, and acellular pertussis</td>
<td>6 weeks</td>
<td>4 weeks 6 months 6 months 6 months</td>
</tr>
<tr>
<td>Influenza</td>
<td>6 weeks</td>
<td>4 weeks 6 weeks 8 weeks 6 weeks (as final dose)</td>
</tr>
<tr>
<td>Haemophilus influenzae type b</td>
<td>6 weeks</td>
<td>4 weeks 8 weeks (as final dose) 6 weeks 6 months</td>
</tr>
<tr>
<td>Pneumococcal</td>
<td>6 weeks</td>
<td>4 weeks 6 weeks 6 months</td>
</tr>
<tr>
<td>Inactivated poliovirus</td>
<td>6 weeks</td>
<td>4 weeks 6 weeks 6 months (minimum age is 4 years for final dose).</td>
</tr>
<tr>
<td>Meningococcal</td>
<td>6 weeks</td>
<td>8 weeks³ 6 months</td>
</tr>
<tr>
<td>Measles, mumps, rubella</td>
<td>12 months</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Varicella</td>
<td>12 months</td>
<td>3 months</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>12 months</td>
<td>6 months</td>
</tr>
</tbody>
</table>

### Children and adolescents age 1 year through 18 years

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Minimum Age for Dose 1</th>
<th>Minimum Interval Between Doses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetanus, diphtheria, tetanus, diphtheria, and acellular pertussis</td>
<td>7 years</td>
<td>4 weeks 4 weeks 5 years 4 weeks 6 months</td>
</tr>
<tr>
<td>Human papillomavirus</td>
<td>Not applicable (N/A)</td>
<td>6 months Routine dosing intervals are recommended.⁸</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>N/A</td>
<td>4 weeks 8 weeks and at least 16 weeks after first dose.</td>
</tr>
<tr>
<td>Inactivated poliovirus</td>
<td>N/A</td>
<td>4 weeks 4 weeks³</td>
</tr>
<tr>
<td>Meningococcal</td>
<td>N/A</td>
<td>8 weeks³</td>
</tr>
<tr>
<td>Measles, mumps, rubella</td>
<td>N/A</td>
<td>3 months 4 months 6 months 6 months 6 months</td>
</tr>
<tr>
<td>Varicella</td>
<td>N/A</td>
<td>3 months if younger than age 13 years. 4 weeks if age 13 years or older.</td>
</tr>
</tbody>
</table>

NOTE: The above recommendations must be read along with the footnotes of this schedule.
Catch-up Guidance Job Aids

**Pneumococcal Conjugate Vaccine (PCV) Catch-Up Guidance for Children 4 Months through 18 Years of Age - 2015**

<table>
<thead>
<tr>
<th>Current Age in Months</th>
<th>No. of Previous Doses</th>
<th>AND</th>
<th>THEN</th>
<th>NEXT DOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 through 6 Months</td>
<td>0</td>
<td></td>
<td></td>
<td>Give Dose 2 at least 6 weeks after Dose 1</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>Give Dose 2 at least 6 weeks after Dose 1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>Give Dose 2 at least 6 weeks after Dose 1</td>
</tr>
<tr>
<td></td>
<td>Unknown</td>
<td></td>
<td></td>
<td>Give Dose 2 at least 6 weeks after Dose 1</td>
</tr>
</tbody>
</table>

**Haemophilus Influenzae type b-Containing Vaccines Catch-Up Guidance for Children 4 Months through 18 Years of Age - 2015**

**Hib Vaccine Products: ActHIB, Pentacel, MenHibrix, or Unknown**

<table>
<thead>
<tr>
<th>Current Age in Months</th>
<th>No. of Previous Doses</th>
<th>AND</th>
<th>THEN</th>
<th>NEXT DOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 through 6 Months</td>
<td>0</td>
<td></td>
<td></td>
<td>Give Dose 1 today</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>Give Dose 2 at least 6 weeks after Dose 1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>Give Dose 2 at least 6 weeks after Dose 1</td>
</tr>
<tr>
<td></td>
<td>Unknown</td>
<td></td>
<td></td>
<td>Give Dose 2 at least 6 weeks after Dose 1</td>
</tr>
</tbody>
</table>

**Diphtheria, Tetanus, and Pertussis-Containing Vaccines Catch-Up Guidance for Children 4 Months through 18 Years of Age - 2015**

<table>
<thead>
<tr>
<th>Current Age in Years</th>
<th>No. of Previous Doses</th>
<th>AND</th>
<th>THEN</th>
<th>NEXT DOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 through 3 years</td>
<td>0</td>
<td></td>
<td></td>
<td>Give Dose 2 (DTaP) today</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>Give Dose 2 (DTaP) today</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>Give Dose 2 (DTaP) today</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td>Give Dose 2 (DTaP) today</td>
</tr>
<tr>
<td></td>
<td>Unknown</td>
<td></td>
<td></td>
<td>Give Dose 2 (DTaP) today</td>
</tr>
</tbody>
</table>

**Haemophilus Influenzae type b-Containing Vaccines Catch-Up Guidance for Children 4 Months through 18 Years of Age - 2015**

**Hib Vaccine Products: Pentacel and Comvax Vaccines Only**

<table>
<thead>
<tr>
<th>Current Age in Months</th>
<th>No. of Previous Doses</th>
<th>AND</th>
<th>THEN</th>
<th>NEXT DOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 through 6 Months</td>
<td>0</td>
<td></td>
<td></td>
<td>Give Dose 1 (DTaP) today</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>Give Dose 2 (DTaP) today</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>Give Dose 2 (DTaP) today</td>
</tr>
<tr>
<td></td>
<td>Unknown</td>
<td></td>
<td></td>
<td>Give Dose 2 (DTaP) today</td>
</tr>
</tbody>
</table>

Reference: Recommended immunization schedule for persons aged 1 through 18 years - United States, 2016. [cdc.gov/vaccines/schedules/hcp/child-adolescent.html#job-aids](http://www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html#job-aids)
Recommended Adult Immunization Schedule—United States - 2014

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

### Figure 1. Recommended adult immunization schedule, by vaccine and age group

<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>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza</td>
<td>1 dose annually</td>
<td>Substitute 1-time dose of Tdap for Td booster: then boost with Td every 10 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetanus, diphtheria, pertussis (Td/Tdap)</td>
<td>1 dose annually</td>
<td>Substitute 1-time dose of Tdap for Td booster: then boost with Td every 10 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella</td>
<td>2 doses</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Female</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Male</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Zoster</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Mumps, rubella, and varicella (MMR)</td>
<td></td>
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<td></td>
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<tr>
<td>Pneumococcal 13-valent conjugate (PCV13)</td>
<td></td>
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<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
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<td></td>
</tr>
<tr>
<td>Haemophilus influenzae type b (Hib)</td>
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<td></td>
</tr>
</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

### Figure 2. Vaccines that might be indicated for adults based on medical and other indications

<table>
<thead>
<tr>
<th>VACCINE</th>
<th>INDICATION</th>
<th>1 dose annually</th>
<th>Substitute 1-time dose of Tdap for Td booster: then boost with Td every 10 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza</td>
<td>Pregnancy</td>
<td>1 dose IV annually</td>
<td></td>
</tr>
<tr>
<td>Tetanus, diphtheria, pertussis (Td/Tdap)</td>
<td>Atelectasis (prepregnant)</td>
<td>1 dose IV annually</td>
<td></td>
</tr>
<tr>
<td>Varicella</td>
<td></td>
<td>Contraindicated</td>
<td></td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Female</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Male</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoster</td>
<td></td>
<td>1 dose</td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal 13-valent conjugate (PCV13)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenzae type b (Hib)</td>
<td></td>
<td></td>
<td></td>
</tr>
</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

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www.cdc.gov/vaccines/schedules/hcp/adult.html
There is a Schedule App!

CDC Vaccine Schedules App for Clinicians and Other Immunization Providers

Note: If you previously downloaded the tool, check that you have version 2.0.1 with 2015 schedules and footnotes.

Healthcare professionals who recommend or administer vaccines can immediately access all CDC recommended immunization schedules and footnotes using the CDC Vaccine Schedules app. Optimized for tablets and useful on smartphones, the app provides up-to-date and comprehensive information for all ages.

The app visually mimics the print and published annually. Users can access and timing with 2 or 3 clicks. Any updates through app updates. This allows access to a collection of applications from CDC, each optimized for your mobile device.

Download the App
Note: If you previously downloaded the tool, check that you have version 2.0.1 with 2015 schedules and footnotes.

Download "CDC Vaccine Schedules" free for iOS and Android devices.

Product Specs
Version: 2.0.1
Requirements: Requires iOS 5.0 or later and Android 2.1 or later; optimized for tablets and useful on smartphones.
Updates: Changes in the app are released through app updates.

Download app free for iOS

Download app free for Android

www.cdc.gov/vaccines/schedules/hcp/schedule-app.html#download
Immunization Coverage
## Estimated Vaccine Coverage Among Children Aged 19-35 Months, NIS 2014

<table>
<thead>
<tr>
<th>State/Area</th>
<th>Vaccine Series*</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>4:3:1:3:3:1:4</td>
<td>71.6%</td>
</tr>
<tr>
<td>Georgia</td>
<td></td>
<td>74.0%</td>
</tr>
</tbody>
</table>

*Includes ≥4 doses DTaP/DT/DTP, ≥ 3 doses polio, ≥ 1 dose MMR, full series Hib, ≥ 3 doses Hep B, ≥ 1 dose varicella, and ≥ 4 doses PCV.

*MMWR 2015; 64(33): 889-896*
Vaccination Coverage Among Children in Kindergarten — United States, 2014–15 School Year

<table>
<thead>
<tr>
<th>State/Area</th>
<th>Vaccine Series</th>
<th>MMR</th>
<th>DTaP</th>
<th>Varicella</th>
</tr>
</thead>
<tbody>
<tr>
<td>Georgia</td>
<td></td>
<td>&gt;94%</td>
<td>&gt;94%</td>
<td>&gt;94%</td>
</tr>
</tbody>
</table>

*MMWR 2015; 64(33): 897-904*
Estimated percentage of children enrolled in kindergarten who have been exempted from receiving one or more vaccines, by state — United States, 2014–15 school year

<table>
<thead>
<tr>
<th>State</th>
<th>Medical</th>
<th>Nonmedical</th>
<th>Any exemption</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Religious</td>
<td>Philosophic</td>
<td>2013-14</td>
<td>2014-15</td>
</tr>
<tr>
<td>Georgia</td>
<td>138 = 0.1%</td>
<td>2,729 = 2%</td>
<td>1.8%</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

*MMWR 2015; 64(33): 897-904*
National Estimated Vaccination Coverage Levels Among Adolescents 13-17 Years
National Immunization Survey-Teen, 2006-2014

US 89.8  
GA 87.5  

US 79.3  
GA 74.9  

US 60.0  
GA 65.4  

US 39.7  
GA 47.1  

US 41.7  
GA 41.2  

US 21.6  
GA 21.0  

MMWR: July 25, 2014 / 63(29);625-33
Influenza Vaccination Coverage Among U.S. Adults: 2011-12, 2012-13, and 2013-14 Seasons

<table>
<thead>
<tr>
<th>Group</th>
<th>2011-12 (%)</th>
<th>2012-13 (%)</th>
<th>2013-14 (%)</th>
<th>Difference (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persons ≥ 18 yrs</td>
<td>38.8</td>
<td>41.5</td>
<td>42.4</td>
<td>3.6</td>
</tr>
<tr>
<td>Persons 18-49 yrs, all</td>
<td>28.6</td>
<td>31.1</td>
<td>32.3</td>
<td>3.7</td>
</tr>
<tr>
<td>Persons 18-49 yrs, high risk</td>
<td>36.8</td>
<td>39.8</td>
<td>38.7</td>
<td>1.9</td>
</tr>
<tr>
<td>Persons 50-64 yrs</td>
<td>42.7</td>
<td>45.1</td>
<td>45.3</td>
<td>2.6</td>
</tr>
<tr>
<td>Persons ≥ 65 yrs</td>
<td>64.9</td>
<td>66.2</td>
<td>65.0</td>
<td>0.1</td>
</tr>
</tbody>
</table>

*Estimates of the percentage of people vaccinated are based on interviews conducted beginning September (BRFSS) or October (NIS) 2013 through June 2014 and reported vaccinations from July 2013 through May 2014. For California, BRFSS interview data were only available for September-December 2013 and thus estimates for persons ≥18 years only reflect vaccinations during July-November 2013. For Mississippi, sample size was insufficient from interviews conducted April-June 2014 to estimate vaccinations past the end of February, 2014 for persons ≥18 years.*
Adult Immunization Coverage, Selected Vaccines by Age and High-risk Status, United States

- Pneumococcal, HR 19-64yrs: 2013 vs. 2012
- Pneumococcal, ≥65 yrs: 2013 vs. 2012
- Zoster, ≥60 yrs: 2013 vs. 2012

HP2020 Targets: 90% PPV ≥65 yrs, 60% PPV HR 19-64 yrs, 30% zoster ≥60 yrs

Data Source: 2012 and 2013 NHIS
Non-influenza Adult Vaccination Coverage
Vaccines with Increases from 2011 to 2013

- Zoster, ≥60 yrs
  - 2013
  - 2012
  - 2011

- HPV (≥1 dose) Men 19-26 yrs
  - 2013
  - 2012
  - 2011

- HPV Men 19-26 yrs <6% 2013

- Tdap, 19-64 yrs
  - 2013
  - 2012
  - 2011

- Tdap, HCP 19-64 yrs
  - 2013
  - 2012
  - 2011

- Hep B, HCP 62% 2013
  - 2020 Target 90%

Data Source: NHIS 2011-2013
Vaccine Information Statements (VISs)
Updated VIS
Multi-vaccines
RV
Hib
Tdap
Td
HPV9
Flu (Live, Intranasal)
Flu (Inactivated or Recombinant)
PPSV23
MenB

www.cdc.gov/vaccines/hcp/vis/index.html
www.cdc.gov/vaccines/hcp/vis/current-vis.html
Measles Update
Measles Cases and Outbreaks

From January 1 to August 21, 2015, 188 people from 24 states and the District of Columbia were reported to have measles (AK, AZ, CA, CO, DC, DE, FL, GA, IL, MA, MI, MN, MO, NE, NJ, NY, NV, OH, OK, PA, SD TX, UT, VA, WA). Most of these cases [117 cases (62%)] were part of a large multi-state outbreak linked to an amusement park in California.

2015 Measles Cases in the U.S.
January 1 to August 21, 2015

Cases*:
- 0
- 1-4
- 5-9
- 10-19
- 20+

*Provisional data reported to CDC’s National Center for Immunization and Respiratory Diseases

www.cdc.gov/measles/cases-outbreaks.html
Investigation revealed both patients had traveled through an airport and used the same gate for their respective flights. Domestic flights board 30–45 minutes before departure, and families with children typically board first. The child's family likely would have been preparing to board near the front of the gate area when the arriving adult exited his aircraft and passed through the area.
Measles anywhere is a threat everywhere.

Since measles is still common in many countries, unvaccinated travelers continue to bring the disease to the United States and spread it to others.

Get Vaccinated: Passport

Make sure you and your family members are up to date on your measles-mumps-rubella (MMR) vaccine, including before traveling internationally. Ask your doctor if you have received all recommended doses of MMR for best protection against measles.

www.cdc.gov/Features/MeaslesInternationalTravel/
Guidance for Healthcare Personnel

- Be vigilant about measles.
- Ensure all patients are up-to-date on measles-mumps-rubella vaccination.
- Consider measles in patients with febrile rash illness and clinically compatible measles symptoms (cough, coryza, and conjunctivitis).

Ask patients about:
- Recent travel internationally.
- Recent travel to domestic venues frequented by international travelers.
- Recent contact with international travelers.
- History of measles in the community.

- Promptly isolate patients with suspected measles.

www.cdc.gov/measles/hcp/index.html
Evidence of Measles Immunity

- Evidence of measles immunity:
  - 2 appropriately spaced and documented doses of MMR vaccine,
  - Laboratory evidence of immunity, or
  - Laboratory confirmation of disease.

- No additional doses are indicated or recommended.

- No serologic testing is recommended.

- For unvaccinated personnel born before 1957 who lack laboratory evidence of measles, rubella, or mumps immunity or laboratory confirmation of disease, healthcare facilities should consider vaccinating personnel with 2 doses of MMR vaccine at the appropriate interval (for measles and mumps) and 1 dose of MMR vaccine (for rubella).
MMR Vaccine

- First dose at 12-15 months, second dose routinely at 4-6 years of age (minimum interval between doses is 4 weeks).
- Infants as young as 6 months should receive MMR before international travel.*
- Infants older than 12 months of age can receive a second dose of MMR before international travel (minimum interval between doses is 4 weeks).
- Unless they have evidence of measles immunity, college and other students, healthcare personnel, and international travelers need 2 appropriately spaced doses and other adults need 1 dose.
- People who received 2 doses of MMR vaccine as children according to the U.S. vaccination schedule are considered protected for life.

*ACIP off-label recommendation; MMWR 2013;62(RR-4)
Medscape Vaccine Acceptance Report: Where Do We Stand?

Have Recent Measles Outbreaks Had Any Impact on Parents' Attitudes Toward Vaccines?
Seasonal Influenza Update

Prevention and Control of Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices, United States, 2015-16 Influenza Season

Weekly
August 7, 2015 / 64(30):818-825

Lisa A. Grohskopf, MD; Leslie Z. Sackler, MSc, MPH;2; Sonja J. Olsen, PhD;1 Joseph S. Bresee, MD; Karen R. Broder, MD; Ruth A. Karron, MD*

This report updates the 2014 recommendations of the Advisory Committee on Immunization Practices (ACIP) regarding the use of seasonal influenza vaccines (1). Updated information for the 2015-16 season includes 1) antigenic composition of U.S. seasonal influenza vaccines; 2) information on influenza vaccine products expected to be available for the 2015-16 season; 3) an updated algorithm for determining the appropriate number of doses for children aged 6 months through 8 years; and 4) recommendations for the use of live attenuated influenza vaccine (LAIV) and inactivated influenza vaccine (IIV) when either is available, including removal of the 2014-15 preferential recommendation for IIV for healthy children aged 2 through 8 years. Information regarding topics related to influenza vaccination that are not addressed in this report is available in the 2013 ACIP seasonal influenza recommendations (2).

Information in this report reflects discussions during public meetings of ACIP held on February 26 and June 24, 2015. Subsequent modifications were made during CDC clearance review to update information, clarify content, and add new data. Meeting minutes, information on ACIP membership, and information on conflicts of interest are available at http://www.cdc.gov/vaccines/acip/committee/members.html. Any updates will be posted at http://www.cdc.gov/flu.

Groups Recommended for Vaccination and Timing of Vaccination
Routine annual influenza vaccination is recommended for all persons aged ≥26 months who do not have contraindications. Optimal vaccination should occur before onset of influenza activity in the community. Health care providers should offer vaccination by October, if possible. Vaccination should continue to be offered as long as influenza viruses are circulating. Children aged 6 months through 8 years who require 2 doses (see "Vaccine Dose Considerations for Children Aged 6 Months through 8 Years") should receive their first dose as soon as possible after vaccine becomes available, and the second dose ≥4 weeks later. To avoid missed opportunities for vaccination, providers should offer vaccination to unvaccinated persons aged ≥26 months during routine health care visits and hospitalizations when vaccine is available.

Antibody levels induced by vaccine decline after vaccination (2–5). Although a 2008 literature review found no clear evidence of more rapid decline among older adults (5), a 2010 study noted a statistically significant decline in antibody titers 6 months after vaccination among persons aged ≥65 years (5). A case-control study conducted in Navarre, Spain, during the 2011-12 influenza season revealed a decline in vaccine effectiveness, primarily affecting persons aged ≥65 years (7). While delaying vaccination might permit greater immunity later in the season, deferral might result in missed opportunities to vaccinate, as well as difficulties in vaccinating a population within a more constrained time period. Vaccination programs should balance maximizing the likelihood of persistence of vaccine-induced protection through the season with avoiding missed opportunities to vaccinate or vaccinating after influenza virus circulation begins.

Influenza Vaccine Composition for the 2015-16 Season
For 2015-16, U.S.-licensed trivalent influenza vaccines will contain hemagglutinin (HA) derived from an A/California/7/2009 (H1N1)-like virus, an A/Switzerland/9715293/2013 (H3N2)-like virus, and a B/Phuket/3073/2013-like (Yamagata lineage) virus. This represents changes in the influenza A (H3N2) virus and the influenza B virus as compared with the 2014-15 season. Quadrivalent influenza vaccines will contain these vaccine viruses, and a B/Brisbane/60/2008-like (Victoria lineage) virus, which is the same Victoria lineage virus recommended for quadrivalent formulations in 2013-14 and 2014-15 (8).

Available Vaccine Products and Indications
Various influenza vaccine products are anticipated to be available during the 2015-16 season (Table). These recommendations apply to all licensed influenza vaccines used within Food and Drug Administration (FDA)-licensed indications. Differences between ACIP recommendations and labeled indications are noted in the table. For persons for whom more than one type of vaccine is appropriate and available, ACIP does not express a preference for use of any particular product over another.

www.cdc.gov/mmwr/preview/mmwrhtml/mm6430a3.htm?s_cid=mm6430a3_e
What Has Changed for 2015-16 Influenza Season?

- All 2015-16 influenza trivalent (three-component) vaccines are made to protect against the following three viruses:
  - A/California/7/2009 (H1N1)pdm09-like virus
  - A/Switzerland/9715293/2013 (H3N2)-like virus
  - B/Phuket/3073/2013-like virus. (This is a B/Yamagata lineage virus)

- In addition, quadrivalent vaccine also protects against B/Brisbane/60/2008-like (Victoria lineage) virus component.
What Has Changed for 2015-16 Influenza Season?

- Healthy children 2 years and older may receive either inactivated or live influenza vaccine – there is no preferential recommendation this season.

- The dosing algorithm for children 6 months through 8 years of age has been adjusted.

www.cdc.gov/mmwr/preview/mmwrhtml/mm6430a3.htm#Fig
### Influenza Vaccines — U.S., 2015–16

<table>
<thead>
<tr>
<th>Trade name</th>
<th>Manufacturer</th>
<th>Presentation</th>
<th>Quadrivalent</th>
<th>Trivalent</th>
<th>Age indications</th>
<th>Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluarix</td>
<td>GSK</td>
<td>0.5 mL MFS</td>
<td>X</td>
<td></td>
<td>≥3 yrs</td>
<td>IM</td>
</tr>
<tr>
<td>FluLaval</td>
<td>ID Biomed Corp.(dist. GSK)</td>
<td>5 mL MDV</td>
<td>X</td>
<td></td>
<td>≥3 yrs</td>
<td>IM</td>
</tr>
<tr>
<td>Fluzone</td>
<td>Sanofi Pasteur</td>
<td>0.25 mL MFS,</td>
<td>X</td>
<td></td>
<td>6 thru 35 mos</td>
<td>IM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5 mL MFS,</td>
<td></td>
<td></td>
<td>≥36 mos</td>
<td>IM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5 mL SDV</td>
<td></td>
<td></td>
<td>≥36 mos</td>
<td>IM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 mL MDV</td>
<td></td>
<td></td>
<td>&gt;6 mos</td>
<td>IM</td>
</tr>
<tr>
<td>Fluzone ID</td>
<td>Sanofi Pasteur</td>
<td>0.1 mL MFS</td>
<td>X</td>
<td></td>
<td>18 thru 64 yrs</td>
<td>ID</td>
</tr>
<tr>
<td>Afluria</td>
<td>bioCSL</td>
<td>0.5 mL MFS</td>
<td>X</td>
<td></td>
<td>≥9 yrs</td>
<td>IM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 mL MDV</td>
<td>X</td>
<td></td>
<td>≥9 yrs via needle; 18 thru 64 yrs via jet injector</td>
<td>IM</td>
</tr>
<tr>
<td>Fluvirin</td>
<td>Novartis</td>
<td>0.5 mL MFS</td>
<td>X</td>
<td></td>
<td>≥4 yrs</td>
<td>IM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 mL MDV</td>
<td>X</td>
<td></td>
<td>≥4 yrs</td>
<td>IM</td>
</tr>
<tr>
<td>Fluzone</td>
<td>Sanofi Pasteur</td>
<td>5 mL MDV</td>
<td>X</td>
<td></td>
<td>≥6 mos</td>
<td>IM</td>
</tr>
<tr>
<td>Flucelvax</td>
<td>Novartis</td>
<td>0.5 mL MFS</td>
<td>X</td>
<td></td>
<td>&gt;18 yrs</td>
<td>IM</td>
</tr>
<tr>
<td>Fluzone HD</td>
<td>Sanofi Pasteur</td>
<td>0.5 mL MFS</td>
<td>X</td>
<td></td>
<td>≥65 yrs</td>
<td>IM</td>
</tr>
<tr>
<td>Flublok</td>
<td>Protein Sciences</td>
<td>0.5 mL SDV</td>
<td>X</td>
<td></td>
<td>≥18 yrs</td>
<td>IM</td>
</tr>
<tr>
<td>FluMist</td>
<td>MedImmune</td>
<td>0.2 mL Intranasal sprayer</td>
<td>X</td>
<td></td>
<td>2 thru 49 yrs</td>
<td>NAS</td>
</tr>
</tbody>
</table>
ACIP Recommendations
Human Papillomavirus (HPV) Vaccination Recommendations of the Advisory Committee on Immunization Practices (ACIP)

During its February 2015 meeting, the ACIP recommended 9-valent human papillomavirus (HPV) vaccine (HPV 9v-HPV; Gardasil® 9, Merck & Co., Inc.) for routine HPV vaccination for girls aged 11 or 12 years (1). HPV vaccine is recommended for routine vaccination at age 11 or 12 years (1). ACIP also recommended vaccination for boys aged 13 through 18 years and males aged 11 through 21 years not vaccinated previously. Vaccination is also recommended through age 26 years for men who have sex with men and for immunocompromised persons (including those who have HIV infection) if not vaccinated previously (1). 9v-HPV is a non-adjuvanted, virus-like particle (VLP) vaccine. Similar to quadrivalent HPV vaccine (4v-HPV), 9v-HPV contains HPV 6, 11, 16, and 18 VLPs. In addition, 9v-HPV contains HPV 31, 33, 45, 52, and 58 VLPs. 9v-HPV was approved by the Food and Drug Administration (FDA) on December 10, 2014, for use in females aged 9 through 18 years and males aged 9 through 15 years (2). For these recommendations, ACIP reviewed 9valent HPV vaccine (HPV 9v-HPV) in males aged 16 through 26 years (4, 5); 9v-HPV is licensed for use in females and males. Evidence for HPV vaccines (24-HPV), which contains HPV 16, 18 VLPs, is licensed for use in females (1). This report summarizes evidence supporting ACIP’s recommendation of 9v-HPV as one of three HPV vaccines that can be used for vaccination and provides recommendations for vaccine use.

Methods

From October 2013 to February 2015, the ACIP HPV Vaccine Work Group reviewed clinical trial data assessing the efficacy, immunogenicity, and safety of 9v-HPV, including data on case-effectiveness of 9v-HPV, and data on burden of type-specific HPV-associated disease in the United States. A summary of evidence and Work Group discussions were presented at ACIP before recommendations were proposed. Recommendations were approved by ACIP at its February 2015 meeting. Evidence supporting 9v-HPV was evaluated using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) framework (3) and determined to be type-2 (moderate level of evidence) among females and 3 (low level of evidence) among males; the recommendation was categorized in a Category A recommendation (for all persons in an age or risk-factor-based group) (4).

HPV-Associated Disease

HPV associated with cervical, vulvar, and vaginal cancer in females, penile cancer in males, and anal and oropharyngeal cancer in both females and males (1, 2, 5, 6, 7, 8). The burden of HPV infection also includes cervical precancers, including cervical intraepithelial neoplasia grades 1 or 2 or 3 and adenocarcinoma in situ (CIN2+) (9). The majority of all HPV-associated cancers are caused by HPV 16 and 18, types targeted by 24v-HPV and HPV 6 and 11 (CIN2+), in the United States (10). Approximately 90% of invasive HPV-associated cancers are attributable to HPV 16 and 18 for females (9). For males, approximately 21,300 cases annually and 10% are attributable to the five additional types of HPV (HPV 31, 33, 45, 52, and 58) for females, 4% for males (approximately 3,400 cases annually) (11, 12, 13). 9v-HPV (4) is associated with 60% for 6v-HPV and the additional types for about 19% of cervical cancers (14, 15, 16, 17). Approximately 50% of CIN2+ are caused by HPV 16 or 18.
<table>
<thead>
<tr>
<th>HPV Vaccines</th>
<th>Bivalent 2vHPV (Cervarix)</th>
<th>Quadrivalent 4vHPV (Gardasil)</th>
<th>9-Valent 9vHPV (Gardasil9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1 VLP types</td>
<td>16, 18</td>
<td>6, 11, 16, 18,</td>
<td>6, 11, 16, 18, 31, 33, 45, 52, 58</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>GSK</td>
<td>Merck</td>
<td>Merck</td>
</tr>
<tr>
<td>FDA Indications</td>
<td>Females (9-25 yrs): Cervical precancer and cancer</td>
<td>Females (9-26 yrs): Anal, cervical, vaginal, and vulvar precancer and cancer; genital warts</td>
<td>Females (9-26 yrs): Anal, cervical, vaginal, and vulvar precancer and cancer; genital warts</td>
</tr>
<tr>
<td></td>
<td>Males: Not approved for use in males</td>
<td>Males (9-26 yrs): Anal precancer and cancer; genital warts</td>
<td>Males (9-15 yrs): Anal precancer and cancer; genital warts</td>
</tr>
</tbody>
</table>
Updated ACIP Recommendations

- Routine vaccination at age 11 or 12 years.*
- Vaccination recommended through age 26 for females and through age 21 for males not previously vaccinated.
- Vaccination recommended for men who have sex with men and immunocompromised men (including persons HIV-infected) through age 26.
- Females: Vaccinate with 2vHPV, 4vHPV (as long as this formulation is available), or 9vHPV.
- Males: Vaccinate with 4vHPV (as long as this formulation is available) or 9vHPV.**

*Vaccination series can be started at 9 years of age
**ACIP off-label recommendation
MMWR 2015;64:300-4
Updated ACIP Recommendations
Interchangeability*

- If vaccination providers do not know or do not have available the HPV vaccine product previously administered, or are in settings transitioning to 9vHPV, for protection against HPV 16 and 18:
  - **Females**: Any HPV vaccine product may be used to continue or complete the series.
  - **Males**: 4vHPV or 9vHPV* may be used to continue or complete the series for males.

*ACIP off-label recommendation
MMWR 2015;64(29):300-4
Updated ACIP Recommendations
Administration

- Administer in a 3-dose schedule*:
  - Dose #2: Administer at least 1 to 2 months after the first dose.
  - Dose #3: Administer at least:
    • 12 weeks after dose 2 AND:
    • 6 months (24 weeks) after dose 1.
  - If the vaccination schedule is interrupted, the series does not need to be restarted.

- IM injection.

*ACIP off-label recommendation
MMWR 2015;64(29):300-4
Updated ACIP Recommendations
HPV Vaccination During Pregnancy

- No change in recommendations.
- HPV vaccine not recommended for use in pregnancy.
- Information on vaccine in pregnancy registries updated:
  - A new vaccine in pregnancy registry has been established for 9vHPV. Exposure during pregnancy can be reported to the respective manufacturer.
  - Registries for 4vHPV and 2vHPV have been closed with concurrence from FDA.
- Patients and healthcare providers can report an exposure to HPV vaccine during pregnancy to the Vaccine Adverse Event Reporting System (VAERS).

www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/ucm426445.htm
CDC HPV Vaccination Resources

- ACIP website with slides, minutes, and recommendations:
  - [www.cdc.gov/vaccines/acip/index.html](http://www.cdc.gov/vaccines/acip/index.html)

- Additional resources for providers/patients/clients:
  - [www.cdc.gov/vaccines/vpd-vac/hpv/](http://www.cdc.gov/vaccines/vpd-vac/hpv/)
  - [www.cdc.gov/vaccines/YouAreTheKey](http://www.cdc.gov/vaccines/YouAreTheKey)
  - [www.cdc.gov/hpv/](http://www.cdc.gov/hpv/)
Use of 13-Valent Pneumococcal Conjugate Vaccine and 23-Valent Pneumococcal Polysaccharide Vaccine Among Adults Aged ≥65 Years: Recommendations of the Advisory Committee on Immunization Practices (ACIP)

Weekly
September 19, 2014 / 63(37):822-825

Sara Tomczyk, MSc2, Nancy M. Bennett, MD1,4, Charles Steecker, PhD2, Ryan Gierke, MPH2, Matthew R. Moore, MD2, Cynthia G. Whitney, MD2, Stephen Hadler, MD2, Tamara Pitlik, MPH1 (author affiliations at end of text)

On August 13, 2014, the Advisory Committee on Immunization Practices (ACIP) recommended routine use of 13-valent pneumococcal conjugate vaccine (PCV13 [Prevnar 13, Wyeth Pharmaceuticals, Inc., a subsidiary of Pfizer Inc.]) among adults aged ≥65 years. PCV13 should be administered in series with the 23-valent pneumococcal polysaccharide vaccine (PPSV23 [Pneumovax 23, Merck & Co., Inc.]); the vaccine currently recommended for adults aged ≥65 years. PCV13 was approved by the Food and Drug Administration (FDA) in late 2011 for use among adults aged ≥50 years. In June 2014, the results of a randomized placebo-controlled trial evaluating efficacy of PCV13 for preventing community-acquired pneumonia among approximately 85,000 adults aged ≥65 years with no prior pneumococcal vaccination history (CAPTIA trial) became available and were presented to ACIP (1). The evidence supporting PCV13 vaccination of adults was evaluated using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) framework and determined to be type 2 (moderate level of evidence); the recommendation was categorized as a Category A recommendation (2). This report outlines the new recommendations for PCV13 use, provides guidance for use of PCV13 and PPSV23 among adults aged ≥65 years, and summarizes the evidence considered by ACIP to make this recommendation.

Epidemiology of Pneumococcal Disease Among Adults Aged ≥65 Years

PCV13 has been used for children since 2006 when it replaced an earlier vaccine, PCV7. The routine use of PCV7 in infants and young children resulted in significant indirect effects in adults. Rates of IPD caused by vaccine serotypes included in PCV7 and a nonvaccine serotype included in PCV13 increased in adults in these groups. In general, children infected with serotypes in PCV13 may have less severe disease and be less likely to cause bacteremia, compared with children infected with vaccine serotypes in PCV7. Therefore, the indirect protection provided by PCV7 is expected to be reduced.

PCV13 was expected to have a similar level of indirect protection for adults as that demonstrated for children. However, additional studies are needed to determine the extent of indirect protection for adults and the potential impact of PCV13 on rates of IPD in adults.

www.cdc.gov/vaccines/pubs/ACIP-list.htm#pcv
ACIP Recommendations for PCV13 and PPSV23

Age 19 Years and Older – Underlying Conditions

• Prior doses count towards doses recommended below and do not need to be repeated.
• If PPSV23 given previously – wait one year before giving PCV13
  – when dose indicated, wait at least five years before giving a second dose of PPSV23.
• No more than two doses of PPSV23 recommended before 65th birthday, and a final third dose thereafter.

Smoker,
Long-term facility resident, or
Chronic conditions:
• heart disease (excluding hypertension)
• lung disease (including asthma)
• liver disease (including cirrhosis)
  • diabetes
  • alcoholism

Immunocompromised
(including HIV infection),
Chronic renal failure,
Nephrotic syndrome, or
Asplenia

PCV13 8 week interval PPSV23 5 year interval PPSV23

CSF leaks or Cochlear implants

PCV13 8 week interval PPSV23

• DO NOT administer PCV13 and PPSV23 at the same visit.
• Medicare reimbursement may depend upon appropriate intervals between doses – check current CMS policy.

For further details, see: www.cdc.gov/vaccines/hcp/acf-recs/vacc-specific/pneumo.html
California Department of Public Health, Immunization Branch www.EZIZ.org
This publication was supported by Grant Number H23/CCH922507 from the Centers for Disease Control and Prevention (CDC)
IMM-1152 (5/15)
ACIP Recommendations for PCV13 and PPSV23 for All Adults 65 Years and Older

- If PCV13 was given before age 65 years, no additional PCV13 is needed.

No history of pneumococcal vaccine

- PCV13 (Prevnar 13®) 6-12 month interval
- PPSV23 (Pneumovax® 23)

Received PPSV23 before age 65

- 1 year interval
- PCV13
- 6-12 month interval (and at least 5 years after prior dose of PPSV23)
- PPSV23

Received PPSV23 at age 65 or older

- 1 year interval
- PCV13

*Minimum interval = 8 weeks
ACIP Recommendations for PCV13 and PPSV23 for All Adults 65 Years and Older

- If PCV13 was given before age 65 years, no additional PCV13 is needed.

- Minimum interval = 8 weeks
# Pneumococcal Disease: Hard to say it; easy to get vaccinated

## Adult Pneumococcal Vaccination Guide for HCPs

Two types of pneumococcal vaccine are recommended for use in US adults: a 13-valent pneumococcal conjugate vaccine (PCV13) and a 23-valent pneumococcal polysaccharide vaccine (PPSV23). Recommendations for their use vary by age and risk factors. Every adult age 65 years and older should receive both PCV13 and PPSV23. The table below will aid in determining when adults age 65 to 64 years need pneumococcal vaccination. Details on sequence and timing of doses for adults in both age groups can be found on page 2 of this document. Additional information and clinical guidance regarding the use of PCV13 and PPSV23 can be found at cdc.gov/vaccines/pcv13/sequence.

## Indications for PCV13 and PPSV23 Administration for Adults Age 19 to 64 Years by Risk Group

*Source: Centers for Disease Control and Prevention (CDC)*

<table>
<thead>
<tr>
<th>Risk Group</th>
<th>Underlying Medical Condition</th>
<th>PCV13 Recommended</th>
<th>PCV13 Recommended</th>
<th>PPSV23 Recommended</th>
<th>PPSV23 Recommended</th>
<th>PCV13 Recommended</th>
<th>PPSV23 Recommended</th>
<th>PCV13 Recommended</th>
<th>PPSV23 Recommended</th>
<th>PCV13 Recommended</th>
<th>PPSV23 Recommended</th>
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<tr>
<td>Immunocompromised persons*</td>
<td>Congenital or acquired</td>
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<td>Renal transplants</td>
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<td>Multiple myeloma</td>
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*See Table 3 and 4 of this document for Risk Group and Underlying Medical Condition details as well as PCV13 and PPSV23 recommendations for adults 65 years and older not routinely vaccinated.*

---

**Additional Facts about Pneumococcal Vaccination**

- **Mild side effects include redness or pain at the injection site. In rare cases fever, muscle aches, or more severe injection site reactions may develop.**
- **Vaccination can be administered any time of year and one pneumococcal vaccine can be given at the same time as influenza vaccine.**
Modifications to Medicare Part B Coverage of Pneumococcal Vaccinations

- Medicare Part B now covers full cost of 2\textsuperscript{nd} pneumococcal vaccination for Medicare enrollees, provided 2\textsuperscript{nd} pneumococcal vaccine is:
  - Different from 1\textsuperscript{st} (e.g., first PCV13 then PPSV23)
  - Administered no less than 11 months after the 1\textsuperscript{st}

Use of Serogroup B Meningococcal Vaccines in Persons Aged ≥10 Years at Increased Risk for Serogroup B Meningococcal Disease: Recommendations of the Advisory Committee on Immunization Practices, 2015

Timothy J. Shedd, MD, MPH; Larry Falwell, MDFP; Stacy W. Martin, MD; Mark J. Stern, MD; Martha Palm, MD; Janice R. MacNeil, MDFP

Methods

The ACIP Meningococcal Vaccines Work Group reviewed safety and immunogenicity data from seven clinical trials of MenB-4C (Trumenba, Pfizer, Inc.) and MenB-024 (Bexsero, Novartis Vaccines) in a 3-dose series. In January 2015, FDA licensed a nonformaldehyde MenB vaccine (MenB-FHbp [Tevaramune, Wyeth Pharmaceuticals, Inc.]) as a 2-dose series. Both vaccines were approved for use in persons aged 10-25 years. Following outbreaks of serogroup B meningococcal disease on two college campuses in 2013, both MenB vaccines were granted Breakthrough Therapy designations, which expedite drug development and review by FDA, and were licensed on an accelerated approval regulation (1). On February 26, 2015, the Advisory Committee on Immunization Practices (ACIP) recommended use of MenB vaccine among certain groups of persons aged ≥10 years who are at increased risk for serogroup B meningococcal disease. This report summarizes information on MenB administration and provides recommendations and guidance for use of these vaccines among persons aged ≥10 years in certain groups who are at increased risk for serogroup B meningococcal disease, and reviews the evidence considered by ACIP to make these recommendations. Recommendations for broader use of MenB vaccine in adolescent and college students will be considered separately by ACIP.

PERSONS AT INCREASED RISK FOR Meningococcal Disease

Persons who have persistent deficiencies (e.g., genetic deficiencies) in the complement pathway (e.g., C3 deficiency, factor D, factor H, or C3-C9) have up to a 10,000-fold increased risk for meningococcal disease and can experience recurrent disease (16-17). Persons receiving immunosupressant (Sotradecol, Merion Pharmaceuticals) for treatment of aspergillosis hematologic syrnx-axis syndrome or prophylactic amphotericin B therapy also are at increased risk because the drug binds to C5 and inhibits the terminal complement pathway (information available at http://astarinet.org/sites/default/files/immunosuppressants.pdf). Similarly, persons with functional or anatomic asplenia (including persons with sickle cell disease) appear to be at increased risk for meningococcal disease, and have a higher mortality rate (40%-70%) from the disease than healthy
## Meningococcal B Vaccines

<table>
<thead>
<tr>
<th>Product Name</th>
<th>FDA Age Indications</th>
<th>Dosage/Route/Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trumenba ® (Pfizer)</td>
<td>10 through 25 years of age</td>
<td>• 3 doses – 0.5 mL each</td>
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<tr>
<td>MenB-FHbp</td>
<td></td>
<td>• IM injection</td>
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<td></td>
<td></td>
<td>• 0-, 2-, and 6-month</td>
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<tr>
<td>Bexsero® (Novartis)</td>
<td>10 through 25 years of age</td>
<td>• 2 doses – 0.5 mL each</td>
</tr>
<tr>
<td>MenB-4C</td>
<td></td>
<td>• IM injection</td>
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<tr>
<td></td>
<td></td>
<td>• 0, 1–6 month</td>
</tr>
</tbody>
</table>
ACIP MenB Recommendations

- Certain persons aged ≥10 years* who are at increased risk for meningococcal disease should receive MenB vaccine. These persons include:
  - Persons with persistent complement component deficiencies.
  - Persons with anatomic or functional asplenia.**
  - Microbiologists routinely exposed to isolates of *Neisseria meningitides*.
  - Persons identified as at increased risk because of a serogroup B meningococcal disease outbreak.

*ACIP off-label recommendation
**Including sickle cell disease

www.cdc.gov/mmwr/preview/mmwrhtml/mm6422a3.htm?s_cid=mm6422a3_w
ACIP MenB Recommendations

- Certain other groups are included in MenACWY (MCV4) recommendations for persons at increased risk, but not in this recommendation.

- **MenB – NOT currently recommended for:**
  - Children aged 2 months – 9 years of age.
  - Persons who travel to or reside in countries where meningococcal disease is hyperendemic or epidemic because risk is generally not caused by serogroup B.
  - Routine use in first-year college students living in residence halls, military recruits, or all adolescents.

www.cdc.gov/mmwr/preview/mmwrhtml/mm6422a3.htm?s_cid=mm6422a3_w
MenB vaccine series may be administered to adolescents and young adults 16 through 23 years of age to provide short-term protection against most strains of serogroup B meningococcal disease. The preferred age for MenB vaccination is 16 through 18 years of age.*

* Permissive recommendation (Category B)

Pending CDC Director’s approval and publication of ACIP recommendations.
ACIP MenB Recommendations

- MenB should be administered as either a 2-dose series of MenB-4C or a 3-dose series of MenB-FHbp.
- The same vaccine product should be used for all doses.
- Based on available data and expert opinion, MenB-4C and MenB-FHbp may be administered concomitantly with other vaccines indicated for this age, but at a different anatomic site, if feasible.
- No product preference to be stated.
New Combination Vaccine
Quadracel

- DTaP-IPV
- Manufacturer: sanofi pasteur
- FDA approved for use in children who received Pentacel or Daptacel:
  - 4 through 6 years of age,
  - 5th dose in the diphtheria, tetanus, pertussis (DTaP) vaccination series, and
  - 4th or 5th dose in the inactivated poliovirus (IPV) vaccination series.

[Link to FDA approval information](https://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM439903.pdf)
Vaccine Storage and Handling
Vaccine Administration
Don’t let this happen!

- “Prosecutor reviewing cases of kids getting wrong medicines. . .” (Salem County, NJ 07/06/15)
- “1,900 doses of flu vaccine spoil in hospital’s faulty fridge” (West Allis, WI; 11/3/04)
- “Kaiser mishandles flu vaccine” (Fresno, CA; 12/15/04)
- “Storage errors cause thousands to be vaccinated again” (Knoxville, TN; 1/21/05)
- “U.S. doctor accused of giving last year’s flu vaccine” (Bellingham, WA; 11/6/04)
- “Frozen vaccine could cost state more than $30,000” (Arkansas; 11/19/04)
S&H and Administration Best Practices

- Store vaccines according to manufacturer guidelines.
- Adhere to “Rights of Medication Administration.”
- Involve staff in selection of products to be used in your facility.
- Provide ongoing staff training and education.
- Keep current reference materials available for staff.
S&H and Administration Resources

Vaccines and Immunizations

Vaccine Administration

Guidelines
- Vaccine Administration
- Immunization Schedules
- Recommendations and Guidelines
- Advisory Committee on Immunization Practices (ACIP)
- Vaccine Storage & Handling

Resources
www.cdc.gov/vaccines/recs/vac-admin/default.htm

Injection Safety

Safe Injection Practices to Prevent Transmission of Infections to Patients

Download the complete 2007 Guideline for Injection Practices - Preventing Transmission of Infections in Healthcare Settings (PEP - 365K PDF)

III.A.1.b. Safe Injection Practices

The investigation of four large outbreaks of H1N1 and H5N1 among patients in ambulatory care facilities in the United States identified a need to define and reinforce safe injection practices. The first outbreak occurred in a private medical practice, a pain clinic, an endoscopy clinic, and a hematologic/oncology clinic. The primary breach in injection control practices that contributed to these outbreaks were: 1) the use of reused needles in a multiple-dose vial/ syringe container (e.g., saline bag) and 2) the use of a single needle/syringe to administer intravenous medication to multiple patients. In one of these outbreaks, preparation of medications in the same vial/ bag or multiple-dose vial/syringe container may have been a contributing factor. These and other outbreaks of viral hepatitis could have been prevented by adherence to basic principles of aseptic technique for the preparation and administration of parenteral medications 343-345. These include the use of a sterile, single-use, disposable needle and syringe for each injection given and prevention of contamination of equipment and medications.

III.A.1.c. Injection Control Practices for Special Procedures

In 2004, CDC investigated eight cases of post-vaccination hepatitis that later were reported to CDC or identified through a review of the 2003-2004 Measles, Mumps, and Rubella (MMR) vaccine surveillance reports. These outbreaks were related to failure to follow CDC’s recommended injection control practices for special procedures. Therefore, it is important that all healthcare workers understand and adhere to recommended practices, principles of injection control and aseptic technique. The use of aseptic technique and injection control practices to prevent transmission of infections is an essential component of basic infection control.

www.cdc.gov/injectionsafety/IP07_standardPrecaution.html
Strategies to Prevent Errors

- Take immediate action if there is a temperature excursion.
- Rotate stock and promptly remove expired vaccines.
- Color code and label vaccines with type, age, and gender (if applicable).
- Store pediatric and adult formulations on separate shelves.
- Store sound-alike and look-alike vaccines on separate shelves.
- Only administer vaccines you have prepared and triple checked.
- Use standardized ACIP vaccine abbreviations.
  - www.cdc.gov/vaccines/acip/committee/guidance/vac-abbrev.html
- Consider using standing orders.
  - www.immunize.org/standing-orders/
- Establish an environment that values reporting and investigating errors as part of risk management and quality improvement.
What if a Vaccine Error Occurs?

- **Inform the patient/parent of the error**
  - Determine the status of the patient
  - Explain any needed next steps

- **Make sure you know how to “correct” the error**
  - Contact your local health department, vaccine manufacturer, or nipinfo@cdc.gov for guidance

- **Record the vaccine as it was given on the vaccine administration record (VAR) and in ASIIS**
Reporting Vaccination Errors to Vaccine Adverse Event Reporting System (VAERS)

- VAERS accepts all reports
- VAERS encourages reports of clinically significant adverse health events
- Providers are encouraged to report vaccination errors without health events if they believe the error may pose a safety risk

https://vaers.hhs.gov/esub/index
REPORTING A MEDICATION OR VACCINE ERROR OR HAZARD TO ISMP

Thank you for your willingness to report a medication or vaccine error or hazard to ISMP.

If you are a CONSUMER, please click on the orange button below if you are ready to report an error or hazard.

FOR CONSUMERS: Report a Medication Error

If you are a HEALTHCARE PRACTITIONER, you can report the error or hazard to ISMP using one of two secure methods:

1) Report to the ISMP National Medication Errors Reporting Program (MERP) or the ISMP National Vaccine Errors Reporting Program (VERP)

These are confidential, voluntary reporting programs operated by ISMP to learn about the causes of medication and vaccine errors. After you submit a report, ISMP staff will follow up with you to ask additional questions to clarify what went wrong and to identify the causes and factors that contributed to the reported event. The report will also be forwarded in confidence to the US Food and Drug Administration (FDA) and, when applicable, to product vendors to inform them about pharmaceutical labeling, packaging, and nomenclature issues that may cause errors by their design. Your name, contact information, and location will NOT be submitted to FDA or product vendors without your permission, and identifiable information will NOT be disclosed outside of ISMP.

Click on the appropriate button below if you are ready to report an error or hazard to the ISMP MERP or ISMP VERP.

https://www.ismp.org/errorReporting/reportErrortoISMP.aspx
Immunization Resources
CDC Resources for Staff Education

- Competency-based education for staff is critical.

- Multiple education products available free through the CDC website:
  - Immunization courses (webcasts and online self-study)
  - Netconferences
  - You Call the Shots self-study modules

- Continuing education credits available.

www.cdc.gov/vaccines/ed/default.htm
Now Available

www.cdc.gov/vaccines/pubs/pinkbook/index.html
www.cdc.gov/vaccines/ed/webinar-epv/index.html
CDC Immunization Resources

- **Questions? E-mail CDC**
  - Providers: nipinfo@cdc.gov
  - Parents and patients: www.cdc.gov/cdcinfo

- **Website**: www.cdc.gov/vaccines

- **Influenza**: www.cdc.gov/flu

- **Vaccine Safety**: www.cdc.gov/vaccinesafety
Immunization Twitter Just for You

@CDCIZlearn is a leading source for healthcare providers on immunization training, recommendations, and information across the lifespan.
Additional Resources

- State Immunization Program
  - www.dhhr.wv.gov/oeps/immunization/providers/Pages/provider_info.aspx
  - And local public health immunization programs, too!

- Immunization Action Coalition www.immunize.org

- Vaccine Education Center www.chop.edu

- American Academy of Pediatrics (AAP) www.aap.org/immunize

- National Foundation for Infectious Diseases (NFID) www.nfid.org
Thank You!

Donna L. Weaver, RN, MN
DWeaver1@cdc.gov