Immunization Update 2019

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Disclosures

- The speaker is a federal government employee with no financial interest in or conflict with the manufacturer of any product named in this presentation
- The speaker will not discuss a vaccine not currently licensed by the FDA
- The speaker will discuss the off-label use of hepatitis A vaccine
Disclosures

- The recommendations to be discussed are primarily those of the Advisory Committee on Immunization Practices (ACIP):
  - Composed of 15 nongovernment 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
- Watch the live webcast
  - https://www.cdc.gov/vaccines/acip/meetings/webcast-instructions.html

CDC ACIP meeting website: http://www.cdc.gov/vaccines/acip/meetings/upcoming-dates.html

Overview

- Vaccination coverage rates
- Vaccine Product Updates
  - HPV
  - Recombivax HB
  - Shingrix
- 2019 Immunization Schedules
- Measles Update
- Influenza
- ACIP Updates
  - Hepatitis A
  - Hepatitis B
  - Tdap
- Zoster vaccination
- Resources

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Vaccination Rates

Vaccine Products Updates

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Since the introduction of the HPV vaccines (4- and 9-types), there has been a significant decrease in the covered strains infection rates.

Prevalence of these same types have also decreased in women who were not vaccinated:
- Prevalence of vaccine types decreased by 40 percent in women who were not vaccinated—implying a herd immunity.
**Pediatric Vaccine Supply: Recombivax HB**

- Merck anticipates having a limited supply of pediatric monovalent hepatitis B vaccine through 2019
- GSK can address the gap in pediatric hepatitis B vaccine using a mix of single-component hepatitis B vaccine and DTaP-HepB-IPV (Pediarix)

**Adult Vaccine Supply: Recombivax HB**

- Merck is not currently distributing its adult hepatitis B vaccine and does not expect to be distributing adult hepatitis B vaccine throughout 2019
- GSK has sufficient supplies of adult hepatitis B vaccines to address the anticipated gap in Merck’s supply of adult hepatitis B vaccine during this period
- In addition, Dynavax makes an adult hepatitis B vaccine (Heplisav-B) that is available for use
Adult Vaccine Supply: Shingrix

- Due to high levels of demand for GSK’s Shingrix vaccine, GSK has implemented order limits and providers have experienced shipping delays
- Order limits and shipping delays will continue throughout 2019
- GSK has increased the U.S. supply available and plans to release more doses on a consistent and reliable basis in 2019

ACIP Immunization Schedule Updates

2019 Immunization Schedules
Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger

Table 1

Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger

United States, 2019

These recommendations must be used with the notes that follow. For those who fall behind in startlists, provide catch-up vaccines at the earliest opportunity as indicated by the green box in Table 1. A detailed course of action can be found on thecdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html. The red boxes indicate additional vaccines that are recommended for those starting 2 years behind. The recommended ages are for those starting on or before their first birthday. For those starting after their first birthday, the recommended ages are available on the cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html.

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### Table 2: Catch-up Immunization Schedule for Persons Aged 4 Months—18 Years who Start Late or Who Are More than 1 Month Behind, United States, 2019

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Age Range</th>
<th>Doses</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphtheria, Tetanus, and Haemophilus Bacterium (DTaP)</td>
<td>4 months</td>
<td>5</td>
<td>1 dose before 16 weeks; additional doses as recommended based on previous immunization history</td>
</tr>
<tr>
<td>Polio</td>
<td>4 months</td>
<td>3</td>
<td>1 dose before 4 months; additional doses as recommended based on previous immunization history</td>
</tr>
<tr>
<td>Haemophilus Bacterium (Hib)</td>
<td>4 months</td>
<td>3</td>
<td>1 dose before 11 months; additional doses as recommended based on previous immunization history</td>
</tr>
<tr>
<td>Measles, Mumps, and Rubella (MMR)</td>
<td>4 months</td>
<td>1</td>
<td>1 dose before 12 months; additional doses as recommended based on previous immunization history</td>
</tr>
<tr>
<td>Varicella</td>
<td>12 months</td>
<td>1</td>
<td>1 dose before 12 months; additional doses as recommended based on previous immunization history</td>
</tr>
</tbody>
</table>

Accessed: 3/31/2019

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### Table 3: Recommended Immunization Schedule for Medical Indication, United States, 2019

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Age Range</th>
<th>Doses</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphtheria, Tetanus, and Haemophilus Bacterium (DTaP)</td>
<td>4 months</td>
<td>5</td>
<td>1 dose before 16 weeks; additional doses as recommended based on previous immunization history</td>
</tr>
<tr>
<td>Polio</td>
<td>4 months</td>
<td>3</td>
<td>1 dose before 4 months; additional doses as recommended based on previous immunization history</td>
</tr>
<tr>
<td>Haemophilus Bacterium (Hib)</td>
<td>4 months</td>
<td>3</td>
<td>1 dose before 11 months; additional doses as recommended based on previous immunization history</td>
</tr>
<tr>
<td>Measles, Mumps, and Rubella (MMR)</td>
<td>4 months</td>
<td>1</td>
<td>1 dose before 12 months; additional doses as recommended based on previous immunization history</td>
</tr>
<tr>
<td>Varicella</td>
<td>12 months</td>
<td>1</td>
<td>1 dose before 12 months; additional doses as recommended based on previous immunization history</td>
</tr>
</tbody>
</table>

Accessed: 3/31/2019

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Recommended Adult Immunization Schedule for ages 19 years or older

**How to use the adult immunization schedule**

1. **Determine the recommended vaccinations by age**
   - Ages 19 to 64 years
   - Ages 65 years or older

2. **Assess need for additional vaccinations for medical conditions or other indications (Table 2)**

3. **Review vaccine types, indications, and contraindications for special situations (Notet)**

**Vacation in the Adult Immunization Schedule**

- **Influenza**
  - Inactivated influenza vaccine (IIV)
    - High-dose
    - Standard dose
  - Live influenza vaccine (LIFV)

- **Pneumococcal**
  - 23-valent polysaccharide vaccine (PCV23)
  - 7-valent pneumococcal conjugate vaccine (PCV7)
  - Pneumococcal conjugate vaccine

- **Hepatitis**
  - Hepatitis A (HepA)
    - Recombinant Hepatitis A (RHA)
  - Hepatitis B (HepB)

- **Meningococcal**
  - Meningococcal A, C, W, Y (MCWY)
  - Meningococcal B
  - Meningococcal type B (MenB)

**Recommended for adults**

- **Recommended for all adults over 19 years of age**
- **Recommended for adults with additional risk factors or another indication**

**Injury issues**

- **Influenza**
  - For individuals 65 years or older
  - For all adults in health care settings

- **Pneumococcal**
  - For adults with chronic health conditions
  - For all adults 65 years or older

- **Hepatitis**
  - For adults with chronic liver disease or cirrhosis

- **Meningococcal**
  - For adults with chronic health conditions

**Helpful information**

- **Checklist for ACIP recommendations**
- **Recommended Adult Immunization Schedule**
- **Pneumococcal conjugate vaccine (PCV13)**
- **Pneumococcal polysaccharide vaccine (PPV23)**
- **Inactivated influenza vaccine**
- **Live influenza vaccine**
- **Hepatitis A**
- **Hepatitis B**
- **Meningococcal A, C, W, Y**
- **Meningococcal B**
- **Meningococcal type B**

**Recommended Adult Immunization Schedule for ages 19 years or older**

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Table 3: Recommended Adult Immunization Schedule by Medical Condition and Other Indications

United States, 2019

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Pregnancy</th>
<th>Interventions (excluding special situations)</th>
<th>Hepatitis B, Hepatitis C, and HIV Infection Treatment and Prevention</th>
<th>Diabetes</th>
<th>Health Care Personnel</th>
<th>Men who have sex with men</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV or RV</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAV</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMR</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAR</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCV13</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPV Female</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPV Male</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MenACWY</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MenB</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPV</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HepA</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HepB</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td>CONTRAINDED</td>
<td>1 dose annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommended vaccination for adults with additional medical conditions or exposure to communicable diseases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:

- Recommended Adult Immunization Schedule United States, 2019

- Recommended Adult Immunization Schedule for ages 19 years or Older

www.cdc.gov/vaccines/schedules/hcp/immunization.html

Accessed 3/31/2019
New Mobile App: PneumoRecs VaxAdvisor

- Quickly and easily see which pneumococcal vaccines a patient needs and when
  - Enter a patient’s age (works for all ages)
  - Note any underlying medical conditions and prior vaccines
  - Get patient-specific guidance consistent with U.S. schedule

- iOS and Android devices
- [cdc.gov/vaccines/pneumoapp](https://www.cdc.gov/vaccines/pneumoapp)

Measles Update
Be vigilant about measles

Consider measles in patients with febrile rash illness and clinically compatible measles symptoms—cough, coryza, and conjunctivitis

Ask patients about:
- Recent international travel
- 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
MMR Vaccination Recommendations*

- Ensure all patients are up to date or have acceptable evidence of immunity
  - Routine recommendations:
    - Children: Dose 1 at 12-15 months; Dose 2 at 4-6 years of age
    - Adults: Health care personnel, college and other students need 2 doses, separated by at least 4 weeks, and all other adults need 1 dose
  - International travel:
    - Infants 6 through 11 months should receive 1 dose of MMR**
    - Previously vaccinated children 1 through 3 years can receive a second dose of MMR at least 4 weeks after the first dose
    - Persons 4 years of age and older should receive 2 doses, separated by at least 4 weeks
- People who received 2 doses of MMR vaccine as children according to the U.S. vaccination schedule are considered protected for life.

*Without evidence of immunity
**ACIP off-label recommendation
MMWR 2013;62(RR-4)

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, mumps, or rubella immunity or laboratory confirmation of disease, facilities should consider vaccinating with 2 doses of MMR at the appropriate interval (for measles and mumps) or 1 dose of MMR (for rubella)

MMWR 2013;62(RR-4)
2018–19 Influenza Season

2018–19 Influenza Season and Disease Burden Estimates

- 34.9 million – 40.1 million flu illnesses
- 16.1 million – 18.8 million flu medical visits
- 482,000 – 585,000 flu hospitalizations
- 32,900 – 54,800 flu deaths


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Influenza activity continues to decrease but remains elevated in the United States.

Influenza A(H1N1)pdm09 viruses predominated October to mid-February, and influenza A(H3N2) viruses more commonly identified since late February. Small numbers of influenza B viruses also reported.

86 influenza-associated pediatric deaths have been reported

Continue to vaccinate—don’t stop!
Interim Estimates of 2018–19 Seasonal Influenza Vaccine Effectiveness — United States, February 2019

<table>
<thead>
<tr>
<th>Influenza A and B</th>
<th>Vaccine effectiveness* Adjusted % (95% CI)†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>47 (34 to 57)§</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
</tr>
<tr>
<td>6 mos–17 yrs</td>
<td>61 (44 to 73)§</td>
</tr>
<tr>
<td>18–49 yrs</td>
<td>37 (9 to 56)§</td>
</tr>
<tr>
<td>≥50 yrs</td>
<td>24 (-15 to 51)</td>
</tr>
</tbody>
</table>

* Vaccine effectiveness was estimated as 100% x (1 – odds ratio [ratio of odds of being vaccinated among outpatients with influenza-positive test results to the odds of being vaccinated among outpatients with influenza-negative test results]); odds ratios were estimated using logistic regression.
† Adjusted for study site, age group, sex, race/ethnicity, self-rated general health, number of days from illness onset to enrollment, and month of illness (4-week intervals) using logistic regression.
§ Statistically significant at p<0.05.

Looking Ahead

- ACIP to vote on recommendations in June
- Many products will be available—IIIV3, IIIV4, and LAIV
  - Indications vary by product, including age, formulation, and type
  - More than one product may be appropriate for any given person
- ACIP/CDC express no preferences for any one type of influenza vaccine product if more than one is appropriate and available
- FDA approved 0.5 mL dose of Fluzone® in children as young as 6 months of age
Dosages (Volume) of Pediatric Flu Vaccine Products for Children

<table>
<thead>
<tr>
<th>Age</th>
<th>Product</th>
<th>Dosage (Amount)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 through 35 months</td>
<td>Afluria</td>
<td>0.25 mL</td>
</tr>
<tr>
<td></td>
<td>Fluzone</td>
<td>0.25 mL or 0.5 mL</td>
</tr>
<tr>
<td></td>
<td>Fluarix</td>
<td>0.5 mL</td>
</tr>
<tr>
<td></td>
<td>FluLaval</td>
<td>0.5 mL</td>
</tr>
<tr>
<td>3 years and older*</td>
<td>All products</td>
<td>0.5 mL</td>
</tr>
</tbody>
</table>

FDA approved 0.5 mL dose of Fluzone in children as young as 6 months of age

*Product eligibility may vary based on the FDA approved age indications

World Health Organization
2019–2020 Northern Hemisphere Vaccine Strains

- For 2019–2020, trivalent (three-component) vaccines are recommended to contain:
  - A/Brisbane/02/2018 (H1N1)pdm09-like virus*
  - A/Kansas/14/2017 (H3N2)-like virus*
  - B/Colorado/06/2017-like virus (Victoria lineage)

- Quadrivalent (four-component) vaccines, which protect against a second lineage of B viruses, include:
  - B/Phuket/3073/2013-like virus (Yamagata lineage)

*New
Advisory Committee on Immunization Practices (ACIP) Updates and *MMWR* Publications

**Updates in ACIP Recommendations for Adults**

**Policy Statements Published 2018/2019**

- **Hepatitis A (Oct 2018)**
  - Added homelessness as indication for HepA
  - Nelson et al. *MMWR* Nov 2018; 67(43):1216–1220
  - Recommendations for postexposure prophylaxis and preexposure prophylaxis for international travel

- **Hepatitis B (Feb 2018 ACIP Meeting)**
  - Schillie et al. *MMWR* Apr 2018;67(15):455–458
  - Recommended use of CpG-adjuvanted HepB

- **Tdap (Summary)**
  - Liang et al. *MMWR* Apr 2018;67(2):1–44

- **Influenza (Jun 2018)**
  - Updated use of LAIV as option for 2018–2019
ACIP Recommendations: Hepatitis A Vaccine

Hepatitis A Virus Infection

- Causes liver disease
- Easily spreads
- Preventable with a vaccine

Spreading Person-to-Person

Among persons reporting drug use or homelessness

- 1,521 cases
- 4 states
- 2017

- 71% hospitalized
- 3% died

- >7,000 cases
- 12 states
- 2016 - 2018

Increase Vaccination

- People who use drugs
- People experiencing homelessness
- Other at-risk groups*

*CDC hepatitis A vaccine recommendations: bit.ly/CDChepA

Data from 2017 outbreaks as reported to CDC from California, Michigan, Kentucky and Utah and published in Fosler et al, MMWR 2018;67(No.43): 1208–1210

www.cdc.gov

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Updated Hepatitis A Recommendations

- The Advisory Committee on Immunization Practices updated hepatitis A recommendations for children and adults during the recent meetings.
- Updated recommendations were published in the *MMWR* on 11/2/2018.

Hepatitis A Immunization Recommendations

- ACIP updated recommendations to add homelessness as an indication for routine hepatitis A vaccination during the October meeting.
- Increasing vaccination coverage among all at-risk groups recommended.
Updated Hepatitis A Immunization Recommendations: Children and Adults

- Recommended for adults who have a specific risk or lack a risk factor but want protection
  - Homelessness
  - Travel to or work in countries with high or intermediate hepatitis A endemicity
  - Men who have sex with men
  - Injection or noninjection drug use
  - Clotting factor disorders
  - Chronic liver disease
  - Close, personal contact with an international adoptee
  - Healthy adults through age 40 years who have recently been exposed to hepatitis A virus
  - Work with hepatitis A virus in a research laboratory or with nonhuman primates infected with hepatitis A virus

Updated Hepatitis A Immunization Recommendations: Children

- Routinely recommended for children 12 through 23 months of age
  - 2-dose schedule (0, 6 months)

- Vaccination should be integrated into the routine vaccination schedule

- Children who are not vaccinated by 2 years of age can be vaccinated at subsequent visits
International Travel and Infants: 6 Through 11 Months of Age

- International travel recommendations* for children 6 through 11 months of age:
  - Hepatitis A: IG (previous)
  - Measles, mumps, rubella: MMR vaccine

- Problematic if both are indicated as IG and live, attenuated vaccines cannot be administered simultaneously

*Countries with high or intermediate hepatitis A endemicity
MMWR 2018;(No.43):1216–20

Hepatitis A Vaccine for International Travelers: Infants

- Administer a single dose of HepA vaccine to infants 6–11 months of age

- Infants should restart the 2-dose series of HepA vaccine at 12 months of age or older as recommended

MMWR 2018;(No.43):1216–20

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Summary: Hepatitis A Vaccine Recommendations and International Travel

<table>
<thead>
<tr>
<th>Age</th>
<th>Vaccine/IG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants 5 months of age or younger</td>
<td>IG</td>
</tr>
<tr>
<td>Infants 6 through 11 months of age</td>
<td>Vaccine (or IG¹)</td>
</tr>
<tr>
<td>Healthy persons 1 year of age or older</td>
<td>Vaccine</td>
</tr>
</tbody>
</table>

**Special Populations**

| Persons with a vaccine contraindication                       | IG         |
| Immunocompromised persons                                     | Vaccine with addition of IG² |
| Persons with chronic liver disease                             | Vaccine    |
| Pregnant women                                                  | Vaccine    |

¹Based on provider risk assessment and availability of vaccine or IG
²If measles is not endemic in the destination area

MMWR 2018;(No.43):1216–20

What Do You Think?

- Achal is 13 months old. A dose of hepatitis A vaccine was administered at 10 months of age due to international travel. When should the next dose of vaccine be administered?
  - 15 months of age
  - 18 months of age
  - Now
ACIP Recommendations: Hepatitis B Vaccine

### Heplisav-B (HepB-CpG)

<table>
<thead>
<tr>
<th><strong>Storage</strong></th>
<th>Store in the refrigerator between 2°C and 8°C (36°F and 46°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ages</strong></td>
<td>18 years of age and older</td>
</tr>
<tr>
<td><strong>Schedule</strong></td>
<td>Administer 2 doses separated by 4 weeks</td>
</tr>
<tr>
<td><strong>Administration</strong></td>
<td>Intramuscular (IM) injection in the deltoid</td>
</tr>
<tr>
<td></td>
<td>Can be administered at the same clinical visit as other</td>
</tr>
<tr>
<td></td>
<td>vaccines. Administer in separate injection sites, 1 inch</td>
</tr>
<tr>
<td></td>
<td>apart (if possible)</td>
</tr>
<tr>
<td><strong>Contraindication</strong></td>
<td>History of severe allergic reaction (e.g., anaphylaxis)</td>
</tr>
<tr>
<td></td>
<td>after a previous dose of any hepatitis B vaccine or to any</td>
</tr>
<tr>
<td></td>
<td>component of Heplisav-B, including yeast</td>
</tr>
</tbody>
</table>

Additional Heplisav-B Considerations

- 2-dose HepB series only applies when BOTH doses are Heplisav-B, administered at least 4 weeks apart
  • Any 2 doses of Heplisav-B separated by 4 weeks is considered complete, even if the patient has had other HepB vaccine products

- Until safety data are available for Heplisav-B, providers should vaccinate pregnant women needing HepB vaccination with Engerix-B or Recombivax HB

Scenarios

1.
HepB
Engerix-B or RecombivaxHB
01/01/2018
HepB-CpG
Heplisav-B
01/02/2018
HepB-CpG
Heplisav-B
02/02/2018
Completed series
No additional doses are needed

2.
HepB
Engerix-B or RecombivaxHB
01/01/2018
HepB-CpG
Heplisav-B
02/01/2018
HepB
Engerix-B or RecombivaxHB
05/01/2018
Completed series
No additional doses are needed
ACIP Recommendations: Tdap Vaccine

ACIP Recommendations: DTaP and Tdap

- DTaP/Tdap recommendations were published on April 27, 2018
- Compiles and summarizes all previously published ACIP recommendations regarding prevention and control of pertussis, tetanus, and diphtheria, specifically after the introduction of acellular pertussis vaccines, DTaP and Tdap vaccines

Note: These slides may differ from those used in the presentation.
ACIP Adolescent Recommendations: Tdap

- Routinely recommended at 11–12 years of age
  - Don’t forget MenACWY, too!

- Catch-up adolescents 13 years of age and older who were not vaccinated

- Adolescents who received Tdap inadvertently or as part of the catch-up series between 7–10 years of age should be given the routine adolescent Tdap dose at 11–12 years of age

MMWR 67(2):1–44

Adolescents and Catch-Up

- Strategies:
  - Use the IIS
    - Assess at every encounter
    - Check for needed vaccines in the IIS BEFORE determining vaccine to administer
  - Use standing orders
  - Have resources and printable guidance available for staff

Immunization Action Coalition standing orders templates www.immunize.org/standing-orders/ Accessed 4/1/2019

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ACIP Adult Recommendations: Tdap

- Administer Tdap vaccine to persons 11 years of age and older who were NOT previously vaccinated and to those with unknown vaccination status
  - Persons who were vaccinated with Tdap during adolescence (or at another time) = previously vaccinated, including:
    - Health care personnel
    - New fathers
    - Close contacts of newborns
    - Day care workers or babysitters
  - No additional doses are recommended

No Additional Doses of Tdap for the General Population

- ACIP recognizes the increasing burden of pertussis and the need for an effective strategy to reduce this burden
- A study evaluating additional doses of Tdap administered at either a 5- or 10-year interval suggested that the reduction in pertussis disease burden would be limited
- ACIP concluded that the data do not support a general recommendation for a routine second dose of Tdap, and that the public health impact of routinely recommending a second dose of Tdap would be limited

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ACIP Recommendations for Pregnant Women

- **Pregnant women:**
  - Administer Tdap during each pregnancy, preferably at 27 through 36 weeks’ gestation
  - If not administered during pregnancy, Tdap should be administered immediately postpartum to women **not previously vaccinated** with Tdap
  - Additional doses of Tdap are not indicated for previously vaccinated postpartum women
    - History of an adolescent dose (or Tdap given at another time) = previously vaccinated

MMWR 67(2):1–44

Tdap and Pregnant Women

- **Vaccination coverage for pregnant women:**
  - 2010 and earlier <1%
  - 2013 28%
  - 2015 53%

- **96% of Tdap vaccinations were administered in physicians’ offices or clinics**

MMWR 66(41):1105–1108
CDC Clinical Resources for Health Care Personnel: Tdap

- Pink Book webinar series with free CE
  www.cdc.gov/vaccines/ed/webinar-epv/index.html
- Updated ACIP recommendations
  www.cdc.gov/mmwr/volumes/67/rr/pdfs/rr6702a1-H.pdf
- Catch-up guidance for children 7 through 18 years of age
- HCP materials on vaccinating pregnant women
  www.cdc.gov/vaccines/pregnancy/hcp/index.html

What Do You Think?

- Lauren (age 24) and her new baby are being discharged today. She was not vaccinated with Tdap vaccine during the pregnancy. Her immunization history includes Tdap at age 16
- Should you administer Tdap prior to discharge?
  a) Yes
  b) No
vco848 3rd bullet--It looks strange for all key words to be capitalized here when they are not capitalized in the other bullets. I would lowercase "up," "guidance," "children," "years," and "age."

Redmon, Ginger (CDC/OID/NCIRD), 3/26/2019
Vaccines for Prevention of Zoster (Shingles)

<table>
<thead>
<tr>
<th>Product (ACIP Abbreviation)</th>
<th>Type</th>
<th>ACIP Age Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zostavax (ZVL)</td>
<td>Live, attenuated</td>
<td>60 years of age and older*</td>
</tr>
<tr>
<td>Shingrix (RZV)</td>
<td>Inactivated, adjuvanted</td>
<td>50 years of age and older</td>
</tr>
</tbody>
</table>

*Zostavax is FDA approved for persons 50 years of age and older*
RZV Zoster Vaccine: Shingrix

- **Storage:** Store vaccine AND diluent between 2°C and 8°C (36°F and 46°F)
- **Preparation:** Use the adjuvanted diluent supplied by the manufacturer to reconstitute the vaccine just before administering
- **Schedule:** 2 doses, 2 to 6 months apart
- **Route:** IM injection
  - Site: Deltoid or the thigh may be used if necessary
  - Needle gauge: 22–25 gauge
  - Needle length: Varies by weight and injection technique
- **May administer during the same clinical visit as other needed vaccines**
  - Administer in a separate limb from other vaccines, if possible

---

Vaccine Efficacy and Effectiveness against HZ for HZ/su and ZVL, by Age Group, During the First 4 Years Following Vaccination

- **HZ/su (ZOE 50/70)**
- **ZVL (RCTs)**
- **ZVL (Baxter 2017)**
- **ZVL (Izurieta 2017)**

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*Median follow-up may be less than 3 yrs: Schmader 2012= 1.3 yrs


*RCTs= 50–59 yrs: Schmader 2012, 60-69 and 70+ yrs: Oxman 2005

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ACIP Zoster Recommendations

- Persons 50 years of age and older should be vaccinated with zoster vaccine
- Shingrix is preferred to Zostavax for persons 60 years and older
- Administer 2 doses of Shingrix to immunocompetent persons
  - Regardless of previous history of vaccination with varicella-containing vaccines—Varivax or Zostavax
  - Separate Shingrix and varicella-containing vaccines by at least 8 weeks

Ensure Your Patients Get Both Doses!

- There are currently ordering limits and intermittent shipping delays for Glaxo Shingrix vaccine
- Use proven strategies to help patients complete the series, including:
  - Use a reminder and recall system to contact patients when you have Shingrix
    - Give first consideration to patients due for their second dose of Shingrix
  - If you are out of Shingrix and a patient needs a second dose, refer the patient to another provider in the community that has Shingrix
  - Be sure to enter your patients’ current vaccination information into your state’s immunization information system (IIS)
  - As supply becomes less constrained, notify eligible patients so they can come in to get their first dose of Shingrix
RZV (Shingrix) Adverse Reactions

<table>
<thead>
<tr>
<th>Local reactions</th>
<th>49%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local reactions – Grade 3</td>
<td>9.4%</td>
</tr>
<tr>
<td>Systemic reactions (headache, malaise, fatigue)</td>
<td>45–78%</td>
</tr>
<tr>
<td>Systemic reactions (headache, malaise, fatigue) – Grade 3</td>
<td>11%</td>
</tr>
</tbody>
</table>

Adverse Reactions after Shingrix

- **Educate patients regarding:**
  - Potential adverse reactions, including injection site and systemic reactions
  - The need for a second dose—even if s/he has an adverse reaction

- **Offer comfort measures and strategies**

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CDC unpublished photo. Used with the permission of the patient.
CDC Clinical Resources for Health Care Personnel: Zoster

- Pink Book webinar series with free CE
- Shingles (Herpes Zoster) vaccination information for health care providers
  [www.cdc.gov/vaccines/vpd/shingles/hcp/index.html](http://www.cdc.gov/vaccines/vpd/shingles/hcp/index.html)
- Shingrix fact sheet
- FAQs on Shingrix
  [www.cdc.gov/vaccines/vpd/shingles/hcp/shingrix/faqs.html](http://www.cdc.gov/vaccines/vpd/shingles/hcp/shingrix/faqs.html)
- Everything you need to know about Shingrix video

What Do You Think?

- There are 2 zoster vaccines. Shingrix is administered as a 2-dose series. Can a documented dose of Zostavax count toward completion of the series if proper spacing is followed?
  a) Yes
  b) No
### New Design for Schedule Web Pages

**Table 1. Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2019**

<table>
<thead>
<tr>
<th>Table 1: Birth Immunizations</th>
<th>Table 2: Catch-up schedule</th>
<th>Table 3: Medical considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Recommended</em></td>
<td><em>Recommended</em></td>
<td><em>Recommended</em></td>
</tr>
<tr>
<td>Vaccines for infant care</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Legend**

- Range of recommended ages for all children
- Range of recommended ages for catch-up immunization
- Range of recommended ages for certain high-risk groups
- Range of recommended ages for certain high-risk groups
- No recommendation

Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger [www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html](http://www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html) Accessed 3/31/2019

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Table 2. Catch-up immunization schedule for persons aged 4 months–18 years who start late or who are more than 1 month behind, United States, 2019

Always make recommendations by determining needed vaccines based on age (Table 1), determining appropriate intervals for catch-up, if needed (Table 2), assessing for medical indications (Table 3), and reviewing special situations (Notes).

The tables below provide 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.

Vaccine Catch-Up Guidance

CDC has developed catch-up guidance job aids to assist health care providers in interpreting Table 2 in the childhood and adolescent immunization schedule.

- Hemophiliac Influenza Type B-Containing Vaccines Catch-Up Guidance for Children 4 Months Through 4 Years of Age
  - Hib vaccine products: Acellular, Peracel, Hibrix, or unknown: [3 pages]
  - Hib vaccine products: PedvaxHIB vaccine only: [2 pages]

- Diphtheria, Tetanus, and Pertussis-Containing Vaccines Catch-Up Guidance for Children 4 Months Through 5 Years of Age
  - Diphtheria, Tetanus, and Pertussis-Containing Vaccines Catch-Up Guidance for Children 4 Months Through 18 Years of Age

https://www.cdc.gov/vaccines/schedules/hcp/imz/catchup.html
## Catch-Up Guidance for Healthy* Children
### 4 Months through 4 Years of Age

#### Pneumococcal Conjugate Vaccine: PCV

The table below provides guidance for children whose vaccinations have been delayed. Start with the current age and information on previous doses/vaccine doses must be documented and must meet minimum age requirements and minimum intervals between doses. Use this table in conjunction with Table 2 of the Recommended Child and Adolescent Immunization Schedule for Ages 0-18 Years or Younger, Healthy People 2020, and www.cdc.gov/vaccines

<table>
<thead>
<tr>
<th>Age (in months)</th>
<th>AND</th>
<th>TIME</th>
<th>DOSE</th>
<th>TOTAL DOSES</th>
<th>NEXT Dose</th>
<th>INTERVAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 through 6</td>
<td>1</td>
<td>After 8 weeks</td>
<td>2</td>
<td>2</td>
<td>2 Do Not Give</td>
<td>8 weeks</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>After 8 weeks</td>
<td>2</td>
<td>2</td>
<td>2 Do Not Give</td>
<td>8 weeks</td>
</tr>
<tr>
<td>6 through 11</td>
<td>1</td>
<td>After 8 weeks</td>
<td>2</td>
<td>2</td>
<td>2 Do Not Give</td>
<td>8 weeks</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>After 8 weeks</td>
<td>2</td>
<td>2</td>
<td>2 Do Not Give</td>
<td>8 weeks</td>
</tr>
<tr>
<td>12 through 23</td>
<td>1</td>
<td>After 8 weeks</td>
<td>2</td>
<td>2</td>
<td>2 Do Not Give</td>
<td>8 weeks</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>After 8 weeks</td>
<td>2</td>
<td>2</td>
<td>2 Do Not Give</td>
<td>8 weeks</td>
</tr>
</tbody>
</table>

*Whereas, Recommended Child and Adolescent Immunization Schedule for Ages 0-18 Years or Younger, Healthy People 2020, and www.cdc.gov/vaccines

### Haemophilus influenzae type b Vaccines: HIB, Pentacel, Hibrix, or Unknown

The table below provides guidance for children whose vaccinations have been delayed. Start with the current age and information on previous doses/vaccine doses must be documented and must meet minimum age requirements and minimum intervals between doses. Use this table in conjunction with Table 2 of the Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger, Healthy People 2020, and www.cdc.gov/vaccines

<table>
<thead>
<tr>
<th>Age (in months)</th>
<th>AND</th>
<th>TIME</th>
<th>DOSE</th>
<th>TOTAL DOSES</th>
<th>NEXT Dose</th>
<th>INTERVAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 through 11</td>
<td>1</td>
<td>After 8 weeks</td>
<td>2</td>
<td>2</td>
<td>2 Do Not Give</td>
<td>8 weeks</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>After 8 weeks</td>
<td>2</td>
<td>2</td>
<td>2 Do Not Give</td>
<td>8 weeks</td>
</tr>
<tr>
<td>12 through 23</td>
<td>1</td>
<td>After 8 weeks</td>
<td>2</td>
<td>2</td>
<td>2 Do Not Give</td>
<td>8 weeks</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>After 8 weeks</td>
<td>2</td>
<td>2</td>
<td>2 Do Not Give</td>
<td>8 weeks</td>
</tr>
<tr>
<td>24 through 35</td>
<td>1</td>
<td>After 8 weeks</td>
<td>2</td>
<td>2</td>
<td>2 Do Not Give</td>
<td>8 weeks</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>After 8 weeks</td>
<td>2</td>
<td>2</td>
<td>2 Do Not Give</td>
<td>8 weeks</td>
</tr>
</tbody>
</table>

*Whereas, Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger, Healthy People 2020, and www.cdc.gov/vaccines

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CDC Resources for Staff Education

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

https://www.cdc.gov/vaccines/schedules/hcp/imz/catchup.html
Current Issues in Immunization Netconferences (CIINC) and 2019 EpiVac Pink Book Webinars

- Provide clinicians with the most up-to-date information on immunizations
- Archived versions available
- Sign up for e-mail alerts at
  - www.cdc.gov/vaccines/ed/ciinc/index.html
  - www.cdc.gov/vaccines/ed/webinar-epv/index.html

Immunization Questions?

- Questions? E-mail CDC nipinfo@cdc.gov or www.cdc.gov/cdcinfo
- Vaccines and Immunizations website www.cdc.gov/vaccines
- HCP education www.cdc.gov/vaccines/hcp.htm
- Twitter @DrNancyM_CDC
- Influenza www.cdc.gov/flu
- Vaccine safety www.cdc.gov/vaccinesafety
CDC Immunization Apps for Health Care Personnel

Childhood and adult immunization schedules
www.cdc.gov/vaccines/schedules/hcp/schedule-app.html

Influenza information
www.cdc.gov/flu/apps/cdc-i-flue-za-hcp.html

Morbidity and Mortality Weekly Report (MMWR)
www.cdc.gov/mobile/applications/mobileframework/mmwrpromo.html

PneumoRecs VaxAdvisor
www.cdc.gov/vaccines/vpd/pneumo/hcp/pneumoapp.html

Additional Slides
FYG – PEP for Hepatitis A

- PEP with HepA or IG is effective when administered within 2 weeks of exposure
- Persons 1–40y should receive HepA, persons >40y may also receive IG depending on risk
- Persons ≥1y with immunocompromising conditions or chronic liver disease should receive HepA and IG at same time
- Completing 2-dose series HepA not necessary for PEP; however, for long-term immunity, second dose HepA should be administered ≥6 mos

Nelson et al. MMWR 2018;67(43)