Immunizing Adults: Gaps in Coverage, Updated Recommendations, & Standards of Practice

Missouri’s First Adult Immunization & Billing Summit
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Disclosure

• I have no conflict of interest

• Discussions on unlicensed products will be in the context of ACIP considerations

• Discussions on off-label uses of vaccines are per ACIP recommendations

• The use of trade names is for identification purposes only and does not imply endorsement

• Disclaimer – The opinions expressed in this presentation are solely those of the presenter and do not necessarily represent official positions of HHS
NVPO coordinates the National Vaccine Plan (NVP), the overall purpose of the plan is to guide and facilitate coordination and planning for federal vaccine and immunization system efforts.

- 17 federal agencies within and beyond HHS
- 10 non-federal organizations and stakeholder groups
- NVPO is responsible for coordinating stakeholders and monitoring NVP activities
- NVPO reports to the Assistant Secretary for Health (ASH) on achievements and areas for improvement
FROM VACCINE TO VACCINATION

- Surveillance
- Research
- Development “Translation”
- Licensing
- Recommendations & Use
- Measuring Impact
From Vaccine to Vaccination: A Systems View

Disease Surveillance

Vaccine Research

Vaccine Development

Vaccine Licensure

Translational research for diffusion of innovation

Vaccine Manufacture

Vaccine Sales/Purchase

Vaccine Distribution

Communication and Education Strategies

Develop vaccine recommendations

Attitudes about vaccination

Vaccine Acceptance

Access/ Payment for Vaccination / Reimbursement

Vaccination (Adult, Adolescent and Childhood)

Adverse Event Monitoring

Vaccine Coverage Surveillance

Vaccine Effectiveness

High Vaccination Rates

Population health protection against infectious disease in the U.S. and Globally

Reduced Morbidity and Mortality from infectious disease in the U.S. and Globally

Recognition of public health priorities

Vaccine Coverage Surveillance

Vaccine Injury Compensation

THE NATIONAL VACCINE PROGRAM OFFICE
Overview

• Burden of vaccine-preventable diseases among adults

• Impact of vaccination

• Updates in 2017 adult immunization schedule

• Gaps in vaccination coverage among adults

• Standards for Adult Immunization Practice
Vaccine-preventable diseases disproportionately affect adults, particularly older adults
Health and Economic Impact of Influenza

• Millions of cases per year, varies year to year

• 226,000 hospitalizations per year, >75% among adults\(^1\)

• 3,000–49,000 deaths per year, >90% among adults\(^2\)

• Direct medical cost – $10.4 billion\(^3\)

• With loss of work and life – $87 billion

Source:
Laboratory-confirmed Influenza Hospitalizations Cumulative, October 1, 2016 – April 15, 2017

Rates per 100,000 by season:
- 0-4 yr: 43.2
- 5-17 yr: 16.2
- 18-49 yr: 19.2
- 50-54 yr: 62.1
- 65+ yr: 281

Age Group:
- 0-4 yr
- 5-17 yr
- 18-49 yr
- 50-64 yr
- 65+ yr
Zoster and Post-herpetic Neuralgia on Health-related Quality Of Life

- 1 million cases per year, lifetime risk 32%\(^1\)
- 10–11/1,000 per year for adults ≥60y\(^1\)

**Figure 1:** Impact of herpes zoster on health-related quality of life. Shown are the percentages of participants (n = 261) who reported problems in the EuroQol EQ-5D domains at the time of recruitment (<14 days after rash onset) and after the pain stopped. Median duration of pain was 32.5 days. Error bars = 95% confidence intervals.

**Source:**
1. CDC. Prevention of Herpes Zoster. MMWR 2008;57(RR-5):1–30
2. Drolet M et al. CMAJ 2010
Incidence of Invasive Pneumococcal Disease Among Adults Aged 18-64 Years with Select Underlying Conditions, United States, 2009

- 33,900 cases, 3,700 deaths in 2013
- 89% cases, almost all deaths occur among adults

Source:
1. CDC. Active Bacterial Core Surveillance. Available at: http://www.cdc.gov/abcs/reports-findings/survreports/spneu13.pdf0000
Burden of Pertussis

• 21,000 cases in 2015
  – 22% among adults

• Most severe for infants

• Among hospitalized:
  • Apnea (61%)
  • Pneumonia (23%)
  • Death (1%)

Source:
Incidence of Acute Hepatitis B, By Age Group, United States, 2000–2013

- 3,050 cases in 2015
- Estimated 19,800 cases

Source:
1. CDC. Viral Hepatitis Surveillance United States, 2013. National Center for HIV/AIDS, Viral Hepatitis, STD & TB Prevention/Division of Viral Hepatitis
2. National Notifiable Diseases Surveillance System (NNDSS)
Numbers of U.S. Cancers and Genital Warts Attributed to HPV Infections

Source:
President’s Cancer Panel Annual Report 2012–2013
Vaccination is an important part in preventing serious diseases
Impact of Vaccination – Influenza

- Vaccine effectiveness varies depending on antigenic match, age and health
  - 60-70% in younger adults when good match
  - 30% in adults ≥65y for medically attended illness when good match

- 2016-2017 interim vaccine effectiveness estimate
  - 43% against A(H3N2), similar to years past
  - 61% against A(H1N1)pdm09

Source:
2. Presented at February 2017 ACIP meeting
Impact of Vaccination – Influenza

• Acute respiratory illness or influenza-like illness increases acute myocardial infarction (MI) risk 2x

• Influenza vaccination effectiveness: Meta-analyses\(^1\)–\(^2\)
  • 29% (95%CI 9,44) against acute MI in persons with existing CVD
  • 36% (95%CI 14,53) against major cardiac events with existing CVD

• Recommended by American College of Cardiology and American Heart Association
  • “On par or better than accepted preventive measures [as]:
    • Statins (36%),
    • Anti-hypertensives (15–18%), and
    • Smoking cessation (26%)”

Source:
Impact of Influenza Vaccination
Illnesses and Hospitalizations Prevented, 2011–2016

Source:
https://www.cdc.gov/flu/about/disease/2015-16.htm
Impact of Vaccination – Zoster

- 51% against shingles
- 66% against post-herpetic neuralgia (PHN)
- 80% against most prolonged and extreme cases of PHN

Inactivated adjuvantated herpes zoster subunit vaccine (HZ/su)
  - Not licensed
  - 17% vaccinated vs. 3% placebo with Grade 3 symptoms
  - 96% (95%CI 93,98) effectiveness among 50-, 60-, 70-year olds
  - Subsequent 90% (95%CI 84,94) effectiveness among ≥70y
  - Immunogenicity persisted through 9y post-vaccination

Source:
4. Presented at February 2017 ACIP meeting
Impact of Vaccination – Pneumococcal

- **23-valent pneumococcal polysaccharide vaccine (PPSV23)**
  - 74% (95%CI 55,86) in meta-analysis against IPD
  - Not effective against non-IPD pneumonia
  - 11 unique serotypes (12 common serotypes with PCV13) caused 38% of IPD among adults ≥65y

- **13-valent pneumococcal conjugate vaccine (PCV13) for adults ≥65y**
  - 45% against vaccine-type pneumococcal pneumonia
  - 75% against vaccine-type invasive pneumococcal disease (IPD)

*Source:*
## Impact of Vaccination – Tdap in Pregnancy

Vaccinating pregnant women is 90% effective in preventing pertussis in infants.

### Annual number of pertussis prevented among infants ≤12 months-old with maternal Tdap vaccination, United States, 2000–2011

<table>
<thead>
<tr>
<th>Pertussis</th>
<th>Prevented with Tdap after pregnancy</th>
<th>Prevented with Tdap during pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases (2746)</td>
<td>549</td>
<td>906</td>
</tr>
<tr>
<td>Hospitalizations (1217)</td>
<td>219</td>
<td>462</td>
</tr>
<tr>
<td>Deaths (18)</td>
<td>3</td>
<td>9</td>
</tr>
</tbody>
</table>

**Source:**
CDC. MMWR 2012;61:ND:719–32
CDC. MMWR 2013;62(07):131–135
Impact of Vaccination – Hepatitis B

- 90% effective after completing 3-dose series

- Effectiveness estimated lower in persons with diabetes and increasing age
  - 90% age <40y
  - 80% age 41–59y
  - 65% age 60–69y
  - <40% age ≥70y

Source: MMWR 2011;60:1709–1711
Vaccines are routinely recommended for adults based on age, medical conditions, and other indications.
General Best Practice Guidelines for Immunization

Best Practices Guidance of the Advisory Committee on Immunization Practices (ACIP)

Kroger AT, Duchin J, Vázquez M

1. Introduction

The Centers for Disease Control and Prevention (CDC) recommends routine vaccination to prevent 17 vaccine-preventable diseases that occur in infants, children, adolescents, or adults. This report provides information for clinicians and other health care providers about concerns that commonly arise when vaccinating persons of various ages.

Advisory Committee on Immunization Practices

- Established in 1964 by U.S. Surgeon General under the Public Health Service Act
- Mechanism to establish national immunization policy
- Composed of 15 voting members; also *ex officio* members, liaison representatives
- Rigorous screening for conflicts of interest
- Reviews evidence, develops and votes on recommendations; becomes policy when CDC Director signs off
Background – Adult Immunization Schedule

• **Updated each year:**
  - Represents current, approved ACIP policy
  - Designed for implementation of ACIP recommendations
  - Target audience: clinical care providers and pharmacists

• **Updates approved by:**
  - American College of Physicians
  - American Academy of Family Physicians
  - American College of Obstetricians and Gynecologists
  - American College of Nurse-Midwives

• **Published in:**
  - MMWR
  - Annals of Internal Medicine

• **Health insurance coverage** First Dollar Coverage
Updates – 2017 Adult Immunization Schedule

- **Influenza vaccination – Jun 2016**
  - Not use LAIV in 2016–2017
  - Modified language on egg allergy

- **Tdap vaccination – Oct 2016**
  - Updated guidance for use during pregnancy

- **HPV vaccination – Oct 2016**
  - Updated dosing schedule

- **Hepatitis B vaccination – Oct 2016**
  - Updated definition of chronic liver disease

- **Meningococcal vaccination – Jun and Oct 2016**
  - Use of MenACWY for adults with HIV infection
  - Updated dosing schedule for MenB-FHbp
Influenza Vaccination

• Annual influenza vaccination recommended for persons ≥6 months
  • Age-appropriate IIV standard dose
  • Options include high-dose IIV for ≥65y; adjuvanted IIV for ≥65y; intradermal IIV for 18–64y; cell culture-based IIV for ≥18y; RIV for ≥18y

• “Providers should offer vaccination by the end of October, if possible” (previously “by October”)


• Changes to egg allergy recommendations
  • If hives-only, use any licensed age-appropriate influenza vaccine (IIV or RIV)
  • If other than hives, may use any age-appropriate vaccine in medical setting

Source: MMWR 2016;65(RR-5):29-30
Tdap Vaccination

- Adults recommended to receive Tdap if not received before, then Td booster every 10 years

- Infants of mothers vaccinated with Tdap were born with significantly higher anti-pertussis antibodies compared to infants of unvaccinated mothers
  - If given within the 27–36 weeks administration window
  - Concentration of anti-pertussis antibodies in infant cord blood higher when mothers vaccinated earlier in this window
  - Longer exposure to vaccine allows higher vaccine-induced antibody levels produced by mother and transferred to infant

- Tdap should be given at every pregnancy preferably during early part of gestational weeks 27–36
HPV Vaccination

- Adult females through age 26 and adult males through age 21 should receive 3 doses of HPV vaccine at 0, 1–2, 6 mos, if not previously vaccinated; adult males 22–26 may be vaccinated.

- Noninferior immunogenicity with 2 doses (0, 6 or 12 mos) in girls and boys age 9–14 compared to 3 doses (0, 2, 6 mos) in females age 16–26.

- 2 doses of (0, 6–12 mos) if age <15, 3 doses (0, 1–2, 6 mos) if age ≥15.

- Young adults who did not complete HPV series before age 15:
  - Did not start – give 3 doses of HPV vaccine.
  - Received 1 dose – give 1 dose HPV vaccine.
  - Received 2 doses but <5 mos apart – give 1 dose HPV vaccine.
  - Received 2 doses ≥5 mos apart – considered adequately vaccinated.

*Source:* MMWR 2016;65(49):1405-1408
Hepatitis B Vaccination

• Adults who seek protection may receive HepB at 0, 1, 6 months (options for alternative dosing schedule)

• Recommended
  • At risk for sexual transmission or percutaneous/mucosal exposure
  • MSM
  • Chronic liver disease, end-stage kidney disease, HIV infection
  • Pregnant women at risk in last 6 months
  • Certain facility settings, international travel

• “Adults with chronic liver disease including, but not limited to, hepatitis C virus infection, cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, and an alanine aminotransferase (ALT) or aspartate aminotransferase (AST) level greater than twice the upper limit of normal should receive a HepB series”

Source:
MMWR 2006;55(RR16):1-25
Revised description of chronic liver disease is pending publication
Hepatitis A Vaccination

• Adults who seek protection from Hepatitis A

• Recommended
  • Chronic liver disease
  • Receive clotting factor concentrates
  • MSM
  • Use injection or non-injection drugs
  • Laboratory workers at risk
  • International travel to, adoptees from certain countries

Source: MMWR 2006;55(RR16):1-25
Meningococcal Vaccination

- **MenACWY**
  - Recommended for adults and adolescents at risk (asplenia, complement deficiencies, HIV infection, microbiologists, outbreak settings, international travel, first year college, other); booster if remain at risk

- **MenB**
  - Recommended for persons age $\geq 10$ at increased risk; healthy 16–23 (preferred age 16–18) may receive MenB (no preference between MenB-FHbp and MenB-4C)
  - MenB-4C – 2 doses $\geq 1$ mo apart
  - MenB-FHbp – 3 doses at 0, 1–2, 6 mos if increased risk; healthy 16–23y at no increased risk may receive 2 doses at 0, 6 months

*Source:* Publication pending
Table 1. Medical conditions or other indications for administration of PCV13 and PPSV23 for adults

<table>
<thead>
<tr>
<th>Medical indication</th>
<th>Underlying medical condition</th>
<th>PCV13 for ≥ 19 years Recommended</th>
<th>PPSV23* for 19 through 64 years Recommended</th>
<th>PCV13 at ≥ 65 years Recommended</th>
<th>PPSV23 at ≥ 65 years Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>None of the below</td>
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<tr>
<td>Immunocompetent persons</td>
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<tr>
<td>Alcoholism</td>
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<tr>
<td>Chronic heart disease†</td>
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<tr>
<td>Chronic liver disease</td>
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<tr>
<td>Chronic lung disease†</td>
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<tr>
<td>Cigarette smoking</td>
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<td>Diabetes mellitus</td>
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<td>Cochlear implants</td>
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<td>CSF leaks</td>
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<td>Persons with functional or anatomic asplenia</td>
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<tr>
<td>Congenital or acquired asplenia</td>
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<tr>
<td>Sickle cell disease/other hemoglobinopathies</td>
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<tr>
<td>Immunocompromised persons</td>
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<td>Chronic renal failure</td>
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<td>Congenital or acquired immunodeficiencies†</td>
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<tr>
<td>Generalized malignancy</td>
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<td>HIV infection</td>
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<td>Hodgkin disease</td>
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<tr>
<td>Iatrogenic immunosuppression§</td>
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<tr>
<td>Leukemia</td>
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<tr>
<td>Lymphoma</td>
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<tr>
<td>Multiple myeloma</td>
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<td>Nephrotic syndrome</td>
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<td>Solid organ transplant</td>
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</tbody>
</table>

*This PPSV23 column only refers to adults 19 through 64 years of age. All adults 65 years of age or older should receive one dose of PPSV23 5 or more years after any prior dose of PPSV23, regardless of previous history of vaccination with pneumococcal vaccine. No additional doses of PPSV23 should be administered following the dose administered at 65 years of age or older.

†Including chronic obstructive pulmonary disease, emphysema, and asthma
§Including B- (humoral) or T-lymphocyte deficiency, complement deficiencies (particularly C1, C2, C3, and C4 deficiencies), and phagocytes disorders (excluding chronic granulomatous disease)
§Including congestive heart failure and cardiomyopathies
Adult Pneumococcal Vaccination Recommendations… Distilled

- **Age ≥65**
  - Give PCV13, then PPSV23 in ≥1 year

- **Immunocompromised (20x risk)**
  - Give PCV13, then PPSV23 in ≥8 weeks
  - Give second PPSV23 ≥5 years after first PPSV23
  - Follow recommendations at age ≥65 as appropriate

- **Chronic disease, alcoholism, smoker (3-7x risk)**
  - Give PPSV23
  - Follow recommendations at age ≥65 as appropriate
Zoster Vaccination Recommendations

• 1 dose at age ≥60, regardless of past episodes of zoster

• Adults age ≥60 with chronic medical condition may receive vaccine unless contraindicated (pregnancy, severe immunodeficiency)
Millions of adults get diseases for which we have vaccines
Adult Vaccination Coverage, United States, 2015

- **Published May 2017 – data sources**
  - Non-influenza vaccination coverage: National Health Interview Survey (NHIS)
  - Influenza vaccination coverage: Behavioral Risk Factor Surveillance System (BRFSS)

- **Key findings**
  - Pneumococcal vaccination for 19–64y high risk: 23.0% (↑2.8%)
  - Tdap for ≥19y: 23.1% (↑3.1%); adults living with infants <1y: 41.9% (↑10.0%)
  - Shingles vaccination for ≥60y: 30.6% (↑2.7%)
  - Otherwise similar to 2014 estimates:
    - Pneumococcal vaccination for ≥65y: 63.6%
    - Hepatitis B vaccination for 19–59 years among persons with diabetes: 24.4%
  - Disparities by race and ethnicity, education, income, insurance

*Source:*
https://www.cdc.gov/vaccines/imz-managers/coverage/adultvaxview/coverage-estimates/2015.html
https://www.cdc.gov/flu/fluvaxview/coverage-1516estimates.htm
https://www.cdc.gov/mmwr/volumes/66/ss/pdfs/ss6611.pdf

* The Healthy People 2020 target for coverage is 90% for all vaccines with the exception of rotavirus (80%) and HepA (85%).
† DTP (3+) is not a Healthy People 2020 objective. DTaP (4+) is used to assess Healthy People 2020 objectives.
§ Reflects 3+ doses through 2008, and Full Series (3 or 4 doses depending on type of vaccine received) 2009 and later.

From 2010 to 2015, the percentage of adults aged 65+ who received influenza vaccine increased from 20% to 28%. Coverage for Tetanus increased slightly from 62% in 2010 to 65% in 2015. Pneumococcal vaccine coverage for ages 65+ remained relatively stable, with about 60% of those ages 65+ receiving the vaccine each year. Hepatitis B coverage increased from 20% in 2010 to 33% in 2015. Zoster vaccine coverage for ages 60+ increased from 14% in 2010 to 20% in 2015.
Seasonal Flu Vaccination Coverage by Age Group and Season, United States, 2009-2016

Error bars represent 95% confidence intervals around the estimates.
The 2009-10 estimates do not include the influenza A (H1N1) pdm09 monovalent vaccine.
Starting with the 2011-12 season, adult estimates reflect changes in BRFSS survey methods: the addition of cellular telephonesamples and a new weighting method.

Source: www.cdc.gov/flu
Influenza Vaccination Coverage Among Pregnant Women, 2010-11 through 2016-17 Influenza Seasons

* Beginning in the 2012-13 season, women vaccinated since July 1 were counted as vaccinated; in prior seasons, only women vaccinated since August 1 were counted as vaccinated

† 2016-17 estimate is preliminary
Health Insurance Status and Vaccination Coverage

- 87% reported some type of health insurance
- Vaccination coverage 2–5x higher with health insurance for influenza, Tdap, zoster, and HPV vaccinations
- Among insured persons with ≥10 physician contacts in past 12 months,
  - 24-89% missing recommended vaccine
  - 65% adults with diabetes missing hepatitis B vaccination
  - 61% adults 19–64y at high risk missing pneumococcal vaccine

Source:
Williams WW et al. MMWR 2016;65(1):1–36
## Adult Knowledge and Interest in Vaccination

<table>
<thead>
<tr>
<th>Which of the following best describes you...</th>
<th>Tdap (19+)</th>
<th>Pneumo (65+)</th>
<th>Zoster (60+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am not aware that I need this vaccine</td>
<td>52%</td>
<td>22%</td>
<td>18%</td>
</tr>
<tr>
<td>I am aware that I need this vaccine, but haven’t thought about getting it</td>
<td>6%</td>
<td>3%</td>
<td>6%</td>
</tr>
<tr>
<td>I am considering getting this vaccine, but have not yet decided</td>
<td>5%</td>
<td>3%</td>
<td>9%</td>
</tr>
<tr>
<td>I have decided to get this vaccine, but have not yet gotten vaccinated</td>
<td>3%</td>
<td>4%</td>
<td>8%</td>
</tr>
<tr>
<td>I have decided not to get this vaccine</td>
<td>13%</td>
<td>13%</td>
<td>19%</td>
</tr>
<tr>
<td>I have gotten this vaccine</td>
<td>22%</td>
<td>56%</td>
<td>39%</td>
</tr>
</tbody>
</table>

*Source:* Porter Novelli 2015. Consumerstyles (Fall) Unpublished
Standards for Adult Immunization Practice

- Developed in 1990 to improve vaccine delivery to adults, most recently updated in 2014 by National Vaccine Advisory Committee

- All HCPs, including those who do not provide vaccine services, have role in ensuring patients up-to-date on vaccines

- Call to action for HCPs for adults to:
  - **ASSESS** vaccination status of all patients at every clinical encounter
  - Strongly **RECOMMEND** vaccines that patients need
  - **ADMINISTER** needed vaccines or **REFER** to a vaccine service provider
  - **DOCUMENT** vaccines received by patients in state vaccine registries

- Promoted through National Adult and Influenza Immunization Summit (NAIIS)

*Source:* Public Health Reports 2014;129:115–123
Influenza vaccination coverage before and during pregnancy among women pregnant any time during October 1, 2016 – January 31, 2017 and who visited a health care provider at least once since July 2016, by provider recommendation or offer

Source:
CDC Internet Panel Survey 2017, preliminary
What can be done to Improve Adult Vaccination?

• Increase convenience and access to vaccines

• Incorporate vaccination into patient flow

• Use IIS to document vaccination
  • Tools to remind patients and providers
  • Consolidates patients vaccination records in one place

• Consider immunization data as quality measures of choice

Provide **strong recommendations** to patients
FORMAT OF acip ADULT SCHEDULE

EXTRA SLIDES
Recommended Immunization Schedule for Adults Aged 19 Years or Older, United States, 2017

In February 2017, the Recommended Immunization Schedule for Adults Aged 19 Years or Older, United States, 2017 became effective, as recommended by the Advisory Committee on Immunization Practices (ACIP) and approved by the Centers for Disease Control and Prevention (CDC). The 2017 adult immunization schedule was also reviewed and approved by the following professional medical organizations:

- American College of Physicians (www.acponline.org)
- American Academy of Family Physicians (www.aafp.org)
- American College of Obstetricians and Gynecologists (www.acog.org)
- American College of Nurse-Midwives (www.midwife.org)


The adult immunization schedule describes the age groups and medical conditions and other indications for which licensed vaccines are recommended. The 2017 adult immunization schedule consists of:

- Figure 1. Recommended immunization schedule for adults by age group
- Figure 2. Recommended immunization schedule for adults by medical condition and other indications
- Footnotes that accompany each vaccine containing important general information and considerations for special populations
- Table: Contraindications and precautions for vaccines routinely recommended for adults

Consider the following information when reviewing the adult immunization schedule:

- The figures in the adult immunization schedule should be read with the footnotes that contain important general information and information about vaccination of special populations.
- When indicated, administer recommended vaccines to adults whose vaccination history is incomplete or unknown.
- Increased interval between doses of a multi-dose vaccine does not diminish vaccine effectiveness; therefore, it is not necessary to restart the vaccine series or add doses to the series because of an extended interval between doses.
- Adults with immunocompromising conditions should generally avoid live vaccines, e.g., measles, mumps, and rubella vaccine. Inactivated vaccines, e.g., pneumococcal or inactivated influenza vaccines, are generally acceptable.
- Combination vaccines may be used when any component of the combination is indicated and when the other components of the combination vaccine are not contraindicated.
- The use of trade names in the adult immunization schedule is for identification purposes only and does not imply endorsement by the ACIP or CDC.

Details on vaccines recommended for adults and complete ACIP statements are available at www.cdc.gov/vaccines/hcp/acip-recs/index.html. Additional CDC resources include:

- A summary of information on vaccination recommendations, vaccination of persons with immunodeficiencies, preventing and managing adverse reactions, vaccination contraindications and precautions, and other information can be found in General Recommendations on Immunization at www.cdc.gov/mmwr/preview/mmwrhtml/rr5002a1.htm.
- Vaccine Information Statements that explain benefits and risks of vaccines are available at www.cdc.gov/vaccines/hcp/prof/index.html.
- Information and resources regarding vaccination of pregnant women are available at www.cdc.gov/vaccines/adults/rec-vac/pregnant.html.
- Information on travel vaccine requirements and recommendations is available at www.cdc.gov/travel/destinations/list.
- CDC Vaccine Schedules App for clinicians and other immunization service providers to download is available at www.cdc.gov/vaccines/schedules/hcp/schedule-app.html.
- Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger is available at www.cdc.gov/vaccines/schedules/hcp/index.html.

Report suspected cases of reportable vaccine-preventable diseases to the local or state health department.

Report all clinically significant post-vaccination reactions to the Vaccine Adverse Event Reporting System at www.vaers.hhs.gov or by telephone, 800-822-7967. All vaccines included in the 2017 adult immunization schedule except herpes zoster and 23-valent pneumococcal polysaccharide vaccines are covered by the Vaccine Injury Compensation Program. Information on how to file a vaccine injury claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382.

Submit questions and comments regarding the 2017 adult immunization schedule to CDC through www.cdc.gov/cdcinfo or by telephone, 800-CDC-INFO (800-232-4636), in English and Spanish, 8:00 am–8:00 pm ET, Monday–Friday, excluding holidays.

The following acronyms are used for vaccines recommended for adults:

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HepA</td>
<td>Hepatitis A virus</td>
</tr>
<tr>
<td>HepA-HepB</td>
<td>Hepatitis A and hepatitis B vaccines</td>
</tr>
<tr>
<td>HepB</td>
<td>Hepatitis B vaccine</td>
</tr>
<tr>
<td>Hib</td>
<td>Hemophilus influenzae type b conjugate vaccine</td>
</tr>
<tr>
<td>HPV-vaccine</td>
<td>Human papillomavirus vaccine</td>
</tr>
<tr>
<td>HZV</td>
<td>Herpes zoster vaccine</td>
</tr>
<tr>
<td>IPV</td>
<td>Inactivated influenza vaccine</td>
</tr>
<tr>
<td>LAIV</td>
<td>Live attenuated influenza vaccine</td>
</tr>
<tr>
<td>MenACWY</td>
<td>Meningococcal conjugate vaccine</td>
</tr>
<tr>
<td>MenB</td>
<td>Meninococcal vaccine</td>
</tr>
<tr>
<td>MMR</td>
<td>Measles, mumps, and rubella vaccine</td>
</tr>
<tr>
<td>MPSV4</td>
<td>Meningococcal polysaccharide vaccine</td>
</tr>
<tr>
<td>PCV13</td>
<td>13-valent pneumococcal conjugate vaccine</td>
</tr>
<tr>
<td>PPSV23</td>
<td>23-valent pneumococcal polysaccharide vaccine</td>
</tr>
<tr>
<td>RIV</td>
<td>Recombinant influenza vaccine</td>
</tr>
<tr>
<td>Td</td>
<td>Tetanus and diphtheria toxoids</td>
</tr>
<tr>
<td>Tdap</td>
<td>Tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine</td>
</tr>
<tr>
<td>VAR</td>
<td>Varicella vaccine</td>
</tr>
</tbody>
</table>

1MMWR Morb Mortal Wkly Rep. 2017;66(2). Available at www.cdc.gov/mmwr/volumes/66/wr/mm6602a2.htm?_cid=mm6602a2_w.
Figures 1 and 2 should be read with the footnotes that contain important general information and considerations for special populations.

**Figure 1. Recommended immunization schedule for adults aged 19 years or older by age group, United States, 2017**

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>19-21 years</th>
<th>22-26 years</th>
<th>27-59 years</th>
<th>60-64 years</th>
<th>≥ 65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza¹</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 dose annually</td>
</tr>
<tr>
<td>Td/Tdap²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Substitute Tdap for Td once, then Td booster every 10 yrs</td>
</tr>
<tr>
<td>MMR³</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 or 2 doses depending on indication</td>
</tr>
<tr>
<td>VAR⁴</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 doses</td>
</tr>
<tr>
<td>HZV⁵</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 dose</td>
</tr>
<tr>
<td>HPV-Female⁶</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 doses</td>
</tr>
<tr>
<td>HPV-Male⁶</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 doses</td>
</tr>
<tr>
<td>PCV13⁷</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 dose</td>
</tr>
<tr>
<td>PPSV23⁷</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 or 2 doses depending on indication</td>
</tr>
<tr>
<td>HepA⁸</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 or 3 doses depending on vaccine</td>
</tr>
<tr>
<td>HepB⁹</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 doses</td>
</tr>
<tr>
<td>MenACWY or MPSV⁴¹⁰</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 or more doses depending on indication</td>
</tr>
<tr>
<td>MenB⁹¹</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 or 3 doses depending on vaccine</td>
</tr>
<tr>
<td>Hib¹¹</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 or 3 doses depending on indication</td>
</tr>
</tbody>
</table>

- **Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection**
- **Recommended for adults with additional medical conditions or other indications**
- **No recommendation**
**Figure 2. Recommended immunization schedule for adults aged 19 years or older by medical condition and other indications, United States, 2017**

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Pregnancy / Excl. HIV</th>
<th>Immuno-compromised</th>
<th>HIV Infection CD4+ Count</th>
<th>Asplenia, Persistent Complement Deficiencies</th>
<th>Kidney Failure, End-Stage Renal Disease, on Hemodialysis</th>
<th>Heart or Lung Disease, Chronic Liver Disease</th>
<th>Chronic Kidney Disease</th>
<th>Diabetes</th>
<th>Healthcare Personnel</th>
<th>Men who have sex with men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Td/Tdap</td>
<td></td>
<td></td>
<td></td>
<td>Substitute Tdap for Td once, then Td booster every 10 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMR</td>
<td></td>
<td>contraindicated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAR</td>
<td></td>
<td>contraindicated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HZV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPV—Female</td>
<td></td>
<td></td>
<td></td>
<td>3 doses through age 26 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPV—Male</td>
<td></td>
<td></td>
<td></td>
<td>3 doses through age 21 yrs</td>
<td>3 doses through age 26 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCV13</td>
<td></td>
<td></td>
<td></td>
<td>1 dose</td>
<td>1, 2, or 3 doses depending on indication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPSV23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1, 2, or 3 doses depending on indication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HepA</td>
<td></td>
<td></td>
<td></td>
<td>2 or 3 doses depending on vaccine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HepB</td>
<td></td>
<td></td>
<td></td>
<td>3 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MenACWY or MPSV4</td>
<td></td>
<td></td>
<td></td>
<td>1 or more doses depending on indication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MenB</td>
<td></td>
<td></td>
<td></td>
<td>2 or 3 doses depending on vaccine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hib</td>
<td></td>
<td></td>
<td></td>
<td>3 doses post-HSCT recipients only</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection**
- **Recommended for adults with additional medical conditions or other indications**
- **Contraindicated**
- **No recommendation**
The National Vaccine Program Office

1. Influenza vaccination
   General information
   - All persons aged 6 months or older who do not have a contraindication should receive annual influenza vaccination with an age-appropriate formulation of inactivated influenza vaccine (IIV) or recombinant influenza vaccine (RIV).
   - Special populations
     - Pregnant women who do not have evidence of immunity to rubella should receive 1 dose of MMR upon completion of pregnancy.

2. Tetanus, diphtheria, and acellular pertussis vaccination
   General information
   - Adults who have not received tetanus and diphtheria toxoids and acellular pertussis vaccine (Tdap) or for whom pertussis vaccination status is unknown should receive 1 dose of Tdap followed by a tetanus and diphtheria toxoid (Td) booster every 10 years. Tdap should be administered regardless of when a tetanus or diphtheria toxoid-containing vaccine was last received.
   - Special populations
     - Pregnant women should receive 1 dose of Tdap during each pregnancy, preferably during the early part of gestational weeks 27–36, regardless of prior history of receiving Tdap.

3. Measles, mumps, and rubella vaccination
   General information
   - Adults born in 1957 or later without acceptable evidence of immunity to measles, mumps, or rubella (defined below) should receive 1 dose of measles, mumps, and rubella vaccine (MMR) unless they have a medical contraindication to the vaccine, e.g., pregnancy or severe immunodeficiency.
   - Special populations
     - Pregnant women should be assessed for evidence of rubella immunity.

4. Varicella vaccination
   General information
   - Adults without evidence of immunity to varicella (defined below) should receive 2 doses of single-antigen varicella vaccine (VAR) 4–6 weeks apart, or a second dose if they have received only 1 dose.
   - Special populations
     - Pregnant women should be assessed for evidence of immunity to varicella.

5. Herpes zoster vaccination
   General information
   - Special populations
     - Adults aged 60 years or older should receive 1 dose of herpes zoster vaccine (HZV), regardless of whether they had a prior episode of herpes zoster.

6. Human papillomavirus vaccination
   General information
   - Special populations
     - Pregnant women should be assessed for evidence of immunity to varicella.
7. Pneumococcal vaccination

General information
- Adults who are immunocompromised and aged 65 years or older should receive 13-valent pneumococcal conjugate vaccine (PCV13) followed by 2-valent pneumococcal polysaccharide vaccine (PPSV23) at least 1 year after PCV13.
- Notes: Adults are recommended to receive 1 dose of PCV13 and 2, or 3 doses of PPSV23 depending on indication. When both PCV13 and PPSV23 are indicated, PCV13 should be administered first; PCV13 and PPSV23 should not be administered during the same visit. PPSV23 has previously been administered, PCV13 should be administered at least 1 year after PPSV23. When two or more doses of PPSV23 are indicated, the interval between PPSV23 doses should be at least 5 years. Supplemental information on pneumococcal vaccine timing for adults aged 65 years or older and adults aged 19 years or older at risk for pneumococcal disease (described below) is available at www.cdc.gov/vaccines/pdfs/adult/agegroup.pdf. No additional doses of PPSV23 are indicated for adults who received PPSV23 at age 65 years or older. When indicated, PCV13 and PPSV23 should be administered to adults whose pneumococcal vaccination history is incomplete or unknown.

Special populations
- Adults aged 19 through 64 years with chronic heart disease (including congestive heart failure and cerebrovascular disease); chronic respiratory disease (including emphysema and chronic bronchitis, asthma); chronic liver disease; immune system disease; alcoholic liver disease; diabetes mellitus; or who smoke cigarettes should receive PPSV23. Any adults who are 65 years or older should receive PCV13 and another dose of PPSV23 at least 1 year after PCV13 and at least 5 years after the most recent dose of PPSV23.
- Adults aged 19 years or older with immunocompromising conditions or immunosuppression (as defined below) should receive PCV13 and another dose of PPSV23 at least 8 weeks after PCV13, followed by a second dose of PPSV23 at least 5 years after the first dose of PPSV23. If the most recent dose of PPSV23 was administered before age 65 years or older, administer another dose of PPSV23 at least 8 weeks after PCV13. If the most recent dose of PPSV23 was administered before age 65 years or older, administer another dose of PPSV23 at least 8 weeks after PCV13.

Notes: Immunocompromising conditions that are indications for pneumococcal vaccination are congenital or acquired immunodeficiency including B- or T-lymphocyte deficiency; complement deficiencies; and phagocytic disorders including chronic granulomatous disease; human immunodeficiency virus (HIV) infection; chronic renal failure and nephrotic syndrome; leukemia, lymphoma, Hodgkin disease, generalized malignancy, and multiple myeloma; solid organ transplant; and autoimmune immunosuppression including long-term systemic corticosteroid and radiation therapy. Anatomical or functional asplenia that are indications for pneumococcal vaccination are sickle cell disease and other hemoglobinopathies, congenital or acquired asplenia, splenic dysfunction, and splenectomy. Pneumococcal vaccines should be given at least 2 weeks before immunosuppressive therapy or an elective splenectomy, and as soon as possible to adults who are diagnosed with HPS infection.

8. Hepatitis A vaccination

General information
- Adults who seek protection from hepatitis A virus infection may receive a 2-dose series of single antigen hepatitis A vaccine (Havrix) at either 0 and 6-12 months (Havrix) or 0 and 12-18 months (Vaxaro). Adults may also receive a combination hepatitis A and hepatitis B vaccine (Havrix-IP) (T蹉ienos) as a 3-dose series at 0, 1, and 6 months. Acknowledgment of a specific risk factor by those who seek protection is not needed.

Special populations
- Adults with any of the following indications should receive a HepA series: have chronic liver disease, receive clotting factor concentrates, men who have sex with men, use injection or non-injection drugs, or work with hepatitis A virus infected primates or in a hepatitis A research laboratory setting.
- Adults who travel in countries with high or intermediate levels of endemic hepatitis A infection or anticipate close personal contact with an international adoptee, e.g., reside in the same household or regularly babysit, from a country with high or intermediate level of endemic hepatitis A infection within the first 60 days of arrival in the United States should receive a HepA series.

9. Hepatitis B vaccination

General information
- Adults who seek protection from hepatitis B virus infection may receive a 3-dose series of single-antigen hepatitis B vaccine (HepB) (Engerix-B, Recombivax HB) at 0, 1, and 6 months. Adults may also receive a combined hepatitis A and hepatitis B vaccine (HepA-Hepl) at 0, 1, and 6 months. Acknowledgment of a specific risk factor by those who seek protection is not needed.

Special populations
- Adults at risk for hepatitis B virus infection by sexual exposure should receive a HepA series, including sex partners of hepatitis B surface antigen (HBsAg)-positive persons, sexually active persons who are not in a monogamous monogamous relationship, persons seeking evaluation or treatment for sexually transmitted infection, and men who have sex with men (MSM).
- Adults at risk for hepatitis B virus infection by percutaneous or mucosal exposure to blood should receive a HepA series, including adults who are recent users of injection drugs, household contacts of HBsAg-positive persons, residents and staff of facilities for developmentally disabled persons, incarcerated patients, and public safety workers at risk for exposure to blood or blood-containing body fluids, younger than age 60 years with diabetes mellitus, and age 50 years or older with diabetes mellitus at the discretion of the treating clinician.
- Adults with chronic liver disease, including limited to, hepatitis C virus infection, cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, and alcoholic steatohepatitis (ASH) or a seronegative aminotransferase (ALT) level greater than twice the upper limit of normal should receive a HepA series.
- Adults with end-stage renal disease including those on pre-dialysis care, hemodialysis, peritoneal dialysis, and home dialysis should receive a HepA series. Adults on hemodialysis should receive a 3-dose series of 45 µg Recombivax HB at 0, 1, and 6 months or doses of 45 µg Engerix-B at 0, 1, 2, and 6 months.
- Adults with human immunodeficiency virus (HIV) infection should receive a HepA series.
- Pregnant women who are at risk for hepatitis B virus infection during pregnancy, e.g., having more than one sex partner during the previous 6 months, been evaluated or treated for a sexually transmitted infection, current or recent injection drug use, or had an HBsAg-positive sex partner, should receive vaccination.
- International travelers to regions with high or intermediate levels of endemic hepatitis B virus infection should receive a HepA series.
- Adults in the following settings are assumed to be at risk for hepatitis B virus infection and should receive a HepA series: sexually transmitted disease treatment facilities, HIV testing and treatment facilities, facilities providing drug abuse treatment and prevention services, healthcare settings targeting services to persons who inject drugs, correctional facilities, healthcare settings targeting services to MSM, hemodialysis facilities and end-stage renal disease programs, and institutions and nonresidential day care facilities for developmentally disabled persons.

10. Meningococcal vaccine

General information
- Adults with anatomic or functional asplenia or persistent complement component deficiencies should receive a 2-dose primary series of serogroups A, C, W, and Y meningococcal conjugate vaccine (MenACWY) at least 2 months apart and revaccinate every 5 years. They should also receive a series of serogroup B meningococcal vaccine (MenB) with either a 2-dose series of MenB-4C (Bexsero) at least 1 month apart or a 3-dose series of MenB-Penta (Trumedia) at 0, 1-2, and 6 months.
- Adults with human immunodeficiency virus (HIV) infection who have not been previously vaccinated should receive a 2-dose primary series of MenB-4C at least 2 months apart and revaccinate every 5 years. Those who previously received 1 dose of MenACWY should receive a second dose at least 2 months after the first dose. Adults with HIV infection are not routinely recommended to receive MenB because meningococcal disease in this population is caused primarily by serogroups C, W, and Y.
- Microbiologists who are routinely exposed to isolates of Neisseria meningitidis should receive a 1 dose of MenACWY at least 2 months apart and revaccinate every 5 years if the risk for infection remains, and either a 2-dose series of MenB-4C at least 1 month apart or a 3-dose series of MenB-Penta at 0, 1-2, and 6 months.
- Adults at risk because of a meningococcal disease outbreak should receive 1 dose of MenACWY of the outbreak attributable to serogroup A, C, W, Y, or either a 2-dose series of MenB-4C at least 1 month apart or a 3-dose series of MenB-Penta at 0, 1-2, and 6 months if the outbreak is attributable to serogroup B.
- Adults who travel to or live in countries with epidemics or endemic meningococcal disease should receive 1 dose of MenACWY and revaccinate every 5 years if the risk for infection remains. MenB is not routinely indicated because meningococcal disease in these countries is generally not caused by serogroup B.
- Military recruits should receive 1 dose of MenACWY and revaccinate every 5 years if the risk for infection remains.
- First-year college students aged 19 years or younger who live in residence halls should receive 1 dose of MenACWY if they have not received MenACWY at age 16 years or older.
- Young adults aged 16 through 23 years (preferred age range is 16 through 18 years) who are healthy and not at increased risk for serogroup B meningococcal disease (described above) may receive either a 2-dose series of MenB-4C at least 1 month apart or a 3-dose series of MenB-Penta at 0 and 6 months for short-term protection against most strains of serogroup B meningococcal disease.
- For adults aged 56 years or older who have not previously received serogroups A, C, W, and Y meningococcal vaccine and need only 1 dose, meningococcal polysaccharide vaccine A, C, W, and Y (MCPS4) is preferred. For adults who previously received MenACWY and anticipate receiving multiple doses of serogroups A, C, W, and Y meningococcal vaccine, MenACWY is preferred.
- Notes: MenB-4C and MenB-Penta are not interchangeable, i.e., the same vaccine should be used for all doses to complete the series. There is no recommendation for MenB revaccination at this time.

11. Haemophilus influenzae type b vaccination

Special populations
- Adults who have anatomic or functional asplenia or sickle cell disease, or are undergoing elective splenectomy should receive 1 dose of Haemophilus influenzae Ig conjugate vaccines if they have not previously received Hib. Hib should be administered at least 14 days before splenectomy.
- Adults with a hematopoietic stem cell transplant (HSCT) should receive 4 doses of Hib at least 4 weeks intervals 6-12 months after transplant regardless of their Hib history.
- Notes: Hib is not routinely recommended for adults with human immunodeficiency virus infection because their risk for Haemophilus influenzae type b infection is low.
Table. Contraindications and precautions for vaccines recommended for adults aged 19 years or older

The Advisory Committee on Immunization Practices (ACIP) recommendations and package inserts for vaccines provide information on contraindications and precautions related to vaccines. Contraindications are conditions that increase chances of a serious adverse reaction in vaccine recipients and the vaccine should not be administered when a contraindication is present. Precautions should be reviewed for potential risks and benefits for vaccine recipient. For a person with a severe allergy to latex, e.g., anaphylaxis, vaccines supplied in vials or syringes that contain natural rubber latex should not be administered unless the benefit of vaccination clearly outweighs the risk for a potential allergic reaction. For latex allergies other than anaphylaxis, vaccines supplied in vials or syringes that contain dry, natural rubber or natural rubber latex may be administered.

Contraindications and precautions for vaccines routinely recommended for adults

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Contraindications</th>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>All vaccines routinely recommended for adults</td>
<td>• Severe reaction, e.g., anaphylaxis, after a previous dose or to a vaccine component</td>
<td>• Moderate or severe acute illness with or without fever</td>
</tr>
</tbody>
</table>

**Additional contraindications and precautions for vaccines routinely recommended for adults**

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Additional Contraindications</th>
<th>Additional Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV†</td>
<td>• History of Guillain-Barre Syndrome within 6 weeks after previous influenza vaccination</td>
<td>• Egg allergy other than hives, e.g., angioedema, respiratory distress, lightheadedness, or recurrent emesis, limited airway or required epinephrine or another emergency medical intervention (IFR may be administered in an inpatient or outpatient medical setting and under the supervision of a healthcare provider who is able to recognize and manage severe allergic conditions)</td>
</tr>
<tr>
<td>RIV†</td>
<td>• History of Guillain-Barre Syndrome within 6 weeks after previous influenza vaccination</td>
<td>• LAIV should not be used during 2016–2017 influenza season</td>
</tr>
<tr>
<td>LAIV†</td>
<td>• LAIV should not be used during 2016–2017 influenza season</td>
<td>• Guillain-Barre Syndrome within 6 weeks after a previous dose of tetanus toxoid-containing vaccine</td>
</tr>
<tr>
<td>Tdap/Td</td>
<td>• For pertussis-containing vaccines: encephalopathy, e.g., coma, decreased level of consciousness, or prolonged seizures, not attributable to another identifiable cause within 7 days of administration of a previous dose of a vaccine containing tetanus or diphtheria toxoid or acellular pertussis</td>
<td>• Guillain-Barré Syndrome within 6 weeks after a previous dose of tetanus toxoid-containing vaccine</td>
</tr>
<tr>
<td>MMR</td>
<td>• Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy, human immunodeficiency virus (HIV) infection with severe immunosuppression or transplant rejection</td>
<td>• Recent (within 11 months) receipt of antibody-containing blood product (specific interval depends on product†)</td>
</tr>
<tr>
<td>VAR</td>
<td>• Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy, HIV infection with severe immunosuppression or transplant rejection</td>
<td>• Recent (within 11 months) receipt of antibody-containing blood product (specific interval depends on product†)</td>
</tr>
<tr>
<td>HZV</td>
<td>• Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy, HIV infection with severe immunosuppression or transplant rejection</td>
<td>• Receipt of specific antiviral drugs (acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination (avoid use of these antiviral drugs for 14 days after vaccination)</td>
</tr>
<tr>
<td>HPV vaccine</td>
<td></td>
<td>• Receipt of specific antiviral drugs (acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination (avoid use of these antiviral drugs for 14 days after vaccination)</td>
</tr>
<tr>
<td>PCV13</td>
<td>• Severe allergy reaction to any vaccine containing diphtheria toxoid</td>
<td>• Pregnancy</td>
</tr>
</tbody>
</table>

2. MMR may be administered together with VAR or HZV on the same day. If not administered on the same day, separate live vaccines by at least 28 days.
3. Immun suppressive steroid dose is considered to be daily receipt of 20 mg or more prednisone or equivalent for two or more weeks. Vaccination should be deferred for at least 1 month after discontinuation of immunosuppressive steroid therapy. Providers should consult ACIP recommendations for complete information on the use of specific live vaccines among persons on immune-suppressing medications or with immune suppression because of other reasons.
4. Vaccine should be deferred for the appropriate interval if replacement immune globulin products are being administered. See CDC General recommendations on immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP), MMWR 2011;60(RR-2):1. Available at www.cdc.gov/mmwr/preview/mmwrhtml/rr6002a1.htm.
5. Measles vaccination may temporarily suppress tuberculin reactivity. Measles-containing vaccine may be administered on the same day as tuberculin skin testing, but should not be administered for at least 4 weeks after vaccination.


**Acronyms of vaccines recommended for adults**

- HepA: hepatitis A vaccine
- HepA-Hepl: hepatitis A and hepatitis B vaccines
- HepB: hepatitis B vaccine
- Hib: Hemophilus influenza type b conjugate vaccine
- HPV: human papillomavirus vaccine
- HZV: herpes zoster vaccine
- INF: inactivated influenza vaccine
- LAIV: live attenuated influenza vaccine
- MenACWY: serogroups A, C, W, and Y meningococcal conjugate vaccine
- MenB: serogroup B meningococcal vaccine
- MMR: measles, mumps, and rubella vaccine
- MPSV4: serogroups A, C, W, and Y meningococcal polysaccharide vaccine
- PCV13: 13-valent pneumococcal conjugate vaccine
- PPSV23: 23-valent pneumococcal polysaccharide vaccine
- RV: recombinant influenza vaccine
- Td: tetanus and diphtheria toxoids
- Tdap: tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine
- VAR: varicella vaccine
Standards for Adult Immunization Practices: Strategies and Resources for Implementation
Standards for Adult Immunization Practice

• First published in 2003 by the National Vaccine Advisory Committee

• Changes in immunization practice led to need to update standards
  • More vaccinators and vaccination locations (e.g. pharmacies, workplaces, OB-GYN practices)
  • Increased use of electronic health records and immunization registries (and social media!)
  • Changes in healthcare system (e.g. Affordable Care Act)
Standards for Adult Immunization Practice

• Update published in 2014
  – https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3904889/

• Based on key impact of provider recommendation for patient vaccination

• Call to action for healthcare providers seeing adult patients to:
  • **ASSESS** vaccination status of all patients at every clinical encounter
  • Strongly **RECOMMEND** vaccines that patients need
  • **ADMINISTER** needed vaccines or **REFER** to a vaccine service provider
  • **DOCUMENT** vaccines received by patients in state vaccine registries
Standards for Adult Immunization Practice

- ‘Big tent’ approach
  - Includes public and private providers, immunizing and non-immunizing providers, primary care and specialists
  - All staff in practice can promote patient vaccination

- Emphasis on avoiding missed opportunities for vaccination
  - Incorporate vaccination status assessment into routine care
  - Assess vaccination needs of adult patients at every visit
  - All providers who can vaccinate are encouraged to do so
Implementing the Standards for Adult Immunization Practice: Current Status
Tools for Implementing Adult Immunization Practice Standards
Components of Successful Vaccination Programs

- Use combination of approaches

- Strategies shown to improve coverage:
  - Use of standing orders
  - Use of reminder-recall systems
  - Efforts to remove administrative barriers
  - Provider and practice assessment of vaccination and feedback
  - Use of immunization registries
  - Education of both providers and public (component)

www.thecommunityguide.org/vaccines/index.html
## Meta-analysis of Interventions to Increase Adult Vaccine Uptake

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Odds Ratio*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational change (e.g., standing orders, separate clinics devoted to prevention)</td>
<td>16.0</td>
</tr>
<tr>
<td>Provider reminder</td>
<td>3.8</td>
</tr>
<tr>
<td>Patient financial incentive</td>
<td>3.4</td>
</tr>
<tr>
<td>Provider education</td>
<td>3.2</td>
</tr>
<tr>
<td>Patient reminder</td>
<td>2.5</td>
</tr>
<tr>
<td>Patient education</td>
<td>1.3</td>
</tr>
</tbody>
</table>

*Compared to usual care or control group, adjusted for all remaining interventions.

Source:
Strategies for Assessment

• Incorporate vaccination status assessment into routine care
  • Use vaccination questionnaire or verbal assessment at check-in
  • Check IIS or patient medical record at every encounter
  • Self-reported influenza (and pneumococcal) vaccination status for adults is acceptable

• Stay informed about the latest CDC recommendations for adult vaccination

• Use evidence-based strategies like standing orders, assessment and feedback, and reminders for providers and patients
Resources For Assessment

- Patient check-in vaccine questionnaire

- CDC patient on-line quiz generates tailored list of recommended vaccines to discuss with provider
  www.cdc.gov/vaccines/adultquiz

- CDC adult vaccine schedule app
  www.cdc.gov/vaccines/schedules/hcp/schedule-app.html
Consider:
Health, Age, Lifestyle and Occupation/Other Factors

### H-A-L-O

**Examples Of Assessment Tools**

Patient vaccine needs-assessment form from Immunization Action Coalition at immunize.org.

---

**Before you vaccinate adults, consider their “H-A-L-O”!**

**What is H-A-L-O?** As shown above, it's a simple chart that can help you make an initial assessment about vaccinating a patient based on four factors—**Health**, **Age**, **Lifestyle**, and **Occupation/Other Factors**. In some situations, you may need to vaccinate a patient without considering these factors. For example, all adults need a dose of Tdap as well as an annual vaccine against influenza, and any adult who wishes to receive hepatitis A or hepatitis B can be vaccinated. However, not all patients who receive one or more H-A-L-O factors will need to be vaccinated. Before making a definitive decision, consider the patient’s individual needs and consult the Immunization Action Coalition’s "Summary of Recommendations for Adult Immunizations" for the complete vaccine recommendations of the Centers for Disease Control and Prevention’s Advisory Committee on Immunization Practices (ACIP) at [www.cdc.gov/vaccines/advisory/acip.html](http://www.cdc.gov/vaccines/advisory/acip.html).

**How do I use H-A-L-O?** Though some H-A-L-O factors can be easily determined (e.g., age, pregnancy), you will need to ask your patient about the presence or absence of others. Once you determine which of the factors apply, scan down each column of the chart to see if a sign which indicates a possible need for adult vaccination.

---

**H-A-L-O checklist of factors that indicate a possible need for adult vaccination**

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Health factors</th>
<th>Age factors</th>
<th>Lifestyle factors</th>
<th>Occupational or other factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>HepA, HepB, HB</td>
<td>✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>HPV (booster only)</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>Pneumococcal</td>
<td>✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>MMR</td>
<td>✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>Tdap</td>
<td>✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>Influenza Annual vaccination is recommended for all adults</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
</tbody>
</table>

---

### Notes

- All vaccines may be indicated depending on age, degree of exposure, and medical considerations.

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**Immunization Action Coalition**

1675 Selby Avenue, St. Paul, MN 55104 • 651-647-8900 • [www.immunize.org](http://www.immunize.org) • [www.vaccineinformation.org](http://www.vaccineinformation.org)
Recommendation
Strategies for Recommendation

- Ensure practice providers and staff are up-to-date on recommended vaccinations (walk the walk)
- Share personal story about vaccination or vaccine-preventable disease with hesitant patients
- Encourage consistent vaccination message from all practice staff
- Strongly recommend vaccines to your patients, whether your office stocks them or not
Strengthening Vaccine Recommendations

- **Share the tailored reasons** why the recommended vaccine is right for the patient given age, health status, lifestyle, job, or other risk factors.

- **Highlight positive experiences** with vaccines to reinforce benefits and strengthen confidence in vaccination.

- **Address patient questions and any concerns** about vaccines, including side effects, safety, and vaccine effectiveness, in plain and understandable language.

- **Remind patients that vaccines protect them and their loved ones** from many common and serious diseases.

- **Explain the potential costs of getting VPDs**, including serious health effects, time lost (such as missing work or family obligations), and financial costs.
• Case Presentations/Videos
  – Use of SHARE in different patient scenarios

Addressing FAQs about Adult Vaccines

Hepatitis B Vaccine

Influenza (Flu) Vaccines

Hepatitis A Vaccine

Pneumococcal Vaccines (PCV13 and PPSV23)

What diseases does the vaccine protect against?

Hepatitis B vaccine protects against the hepatitis B virus, which causes inflammation of the liver. The vaccine is crucial for preventing serious liver disease and liver cancer.

How effective is the vaccine?

The hepatitis B vaccine is highly effective, with over 95% of vaccinated individuals developing antibodies against the virus. Booster shots are recommended every 10 years for lifelong protection.

Who should get this vaccine?

The hepatitis B vaccine is recommended for all newborns, babies, children, and adults. It is especially important for healthcare workers, newborns of infected mothers, travelers to high-risk areas, and anyone who may come into close contact with someone who has hepatitis B.

What should one do if they think they have been exposed to liver disease?

If you think you may have been exposed to the hepatitis B virus, contact your healthcare provider immediately. They can provide guidance on whether you need to receive post-exposure prophylaxis and what precautions you should take.

What are the side effects of hepatitis B vaccine?

Common side effects include soreness, redness, and tenderness at the injection site. Less common side effects may include fever, headache, chills, or muscle pain.

When can children begin to receive the vaccine?

The hepatitis B vaccine is recommended for all newborns and is usually given as part of a series of shots starting at birth. The series is typically completed by 24 months of age.

When should adults receive their first dose of hepatitis B vaccine?

Adults should receive their first dose of the vaccine as early as possible, ideally at the time of entry into healthcare risk groups and before exposure to the virus.

What is the importance of hepatitis B vaccine

The hepatitis B vaccine is critical for preventing serious liver disease and liver cancer. It is recommended for all newborns and is important for healthcare workers, newborns of infected mothers, travelers to high-risk areas, and anyone who may come into close contact with someone who has hepatitis B.

What happens if someone already has hepatitis B?

If someone already has hepatitis B, they will not develop immunity from the vaccine. The vaccine should not be given to someone who already has hepatitis B. It is important to test for hepatitis B before receiving the vaccine.

Tdap/Td Vaccines

Zoster (Shingles) Vaccine

What is shingles?

Shingles is a painful skin rash that is caused by the same virus that causes chickenpox. It typically affects one side of the body and can affect the face, eyes, and ears. Shingles can cause extreme pain, blisters, and scarring.

Who is at risk for shingles?

Anyone over the age of 50 is at increased risk for shingles. Other risk factors include weakened immune systems, previous chickenpox, and certain medical conditions.

What is the vaccine for shingles?

The zoster vaccine is a purified live-attenuated virus vaccine (Zostavax) that is given intradermally. It is recommended for all adults over the age of 50 who do not have immunity to varicella-zoster virus.

How effective is the vaccine?

The zoster vaccine is highly effective, with over 80% of vaccinated individuals developing protective immunity. The vaccine can reduce the risk of developing shingles by up to 90%.

When should the vaccine be given?

The zoster vaccine is recommended for all adults over the age of 50 who do not have immunity to varicella-zoster virus. It is important to discuss the vaccine with your healthcare provider to determine the best time for you to receive it.

What are the side effects of the zoster vaccine?

Common side effects include soreness, swelling, and tenderness at the injection site. More serious side effects, such as fever, rash, and injection site reaction, are rare but possible.

For more information on adult vaccines, visit www.cdc.gov/vaccines/

Don't wait. vaccinate!
CDC Adult Patient Education Resources

- Patient Education Portal: [www.cdc.gov/vaccines/AdultPatientEd](http://www.cdc.gov/vaccines/AdultPatientEd)
  - Posters and Flyers
  - Educational factsheets and easy to read schedule
  - Matte articles and web features
  - Radio PSAs
  - Web buttons and banners

- Vaccine Quiz: [www.cdc.gov/vaccines/adultquiz](http://www.cdc.gov/vaccines/adultquiz)

- Website: [www.cdc.gov/vaccines/adults](http://www.cdc.gov/vaccines/adults)
General Fact Sheets for Adults

Vaccines

Know What You Need

All adults need to protect their health against diseases that can affect their body. Each adult should consider getting vaccinated and recommended vaccine:

1. Vaccines every adult needs:
   - Tetanus/Diphtheria (Td) and Pertussis (Whooping Cough) (Tdap)
   - Hepatitis B
   - Influenza (Flu)
   - Pneumococcal (Pneumonia)

2. Vaccines you may need based on your age:
   - Herpes simplex virus (HSV) type 2
   - Meningococcal vaccine
   - Varicella vaccine
   - Human papillomavirus (HPV)

Tdap/Td Vaccines

Addressing Common Questions about Tdap/Td Vaccination for Adults

What diseases do these vaccines protect against?

- Tdap/Td vaccines protect against:
  - Tetanus
  - Diphtheria
  - Pertussis (Whooping Cough)

Who is at risk for tetanus disease?

- It affects people of all ages and is caused by bacteria that enter the body through wounds or openings in the skin. It can cause serious illness and even death.

What would happen if you get tetanus disease?

- Symptoms of tetanus include muscle stiffness, painful cramps, and difficulty breathing.

How are these diseases spread?

- Tdap/Td vaccines protect against:
  - Tetanus
  - Diphtheria
  - Pertussis (Whooping Cough)

For more information on this and other vaccines for adults, visit www.cdc.gov/vaccines/adults.
Real Stories, Real People: Jacob Ryan Schmidt

“A Son’s Life Cut Short by Influenza”

- Jacob was strong as a bull and enjoying life.
- In 2010, at the age of 27, he succumbed to complications from H1N1 influenza.
- His lungs collapsed; he developed an infection. His organs were shutting down. After about five weeks of influenza ravaging his body, Jacob died.

For Jacob’s full story, visit: http://www.nfid.org/real-stories-real-people/jacob-influenza.html#sthash.qbrBJ6AE.dpuf

“Jacob was not someone you’d expect to fall ill to influenza. He was healthy and athletic, and built like a freight train.”
Administration or Referral
Strategies for Administration or Referral

- Develop standing orders or protocols for vaccine administration
- Train and educate staff on vaccine administration
- Ensure your practice is up-to-date with vaccine storage and handling best practices
- Recommend and offer vaccines at the same visit
- Develop relationships with pharmacies, health departments, and other vaccination providers to refer your patients for vaccines you don’t stock
Vaccine Administration Resources

- CDC General Immunization Training
  www.cdc.gov/vaccines/ed/courses.htm

- Immunization Skills Self-Assessment
  www.immunize.org/catg.d/p7010.pdf

- Storage and Handling
  www.cdc.gov/vaccines/recs/storage

- Dose and Route Chart
  www.immunize.org/catg.d/p3084.pdf

- Vaccine Information Statements
  www.cdc.gov/vaccines/hcp/vis

- Guide to Infection Prevention for Outpatient Care

- Chart of Medical Management of Vaccine Reactions in Patients
  www.immunize.org/catg.d/p3082.pdf
Skills Checklist for Immunization

The Skills Checklist is a self-assessment tool for health care staff who administer immunizations. To complete it, review the competency areas below and the clinical skills, techniques, and procedures outlined for each of them. Score yourself in the Self-Assessment column. If you check Need to Improve, you indicate further study, practice, or change is needed. When you check Meets or Exceeds, you indicate you believe you are performing at the expected level of competence, or higher.

Supervisors: Use the Skills Checklist to clarify responsibilities and expectations for staff who administer vaccines. When you use it for performance reviews, give staff the opportunity to score themselves in advance. Next, observe their performance as they provide immunizations to several patients and score in the Supervisor Review column. If improvement is needed, meet with them to develop a Plan of Action (p. 2) that will help them achieve the level of competence you expect, circle dated actions or write new ones.

The DVD “Immunization Techniques: Best Practices with Infants, Children, and Adults” creates that staff administer vaccines correctly. Order online at www.immunize.org/dvd

<table>
<thead>
<tr>
<th>Competency</th>
<th>Clinical Skills, Techniques, and Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Patient/Parent Education</td>
<td>1. Welcomes family/patient, establishes rapport, and answers any questions.</td>
</tr>
<tr>
<td></td>
<td>2. Explains what vaccine will be given and which type(s) of injection will be done.</td>
</tr>
<tr>
<td></td>
<td>3. Accommodates language or literacy barriers and special needs of patients or parents to help them feel comfortable and informed about the procedure.</td>
</tr>
<tr>
<td></td>
<td>4. Verifies patients or parents received the Vaccine Information Statements for indicated vaccines, and had time to read them and ask questions.</td>
</tr>
<tr>
<td></td>
<td>5. Screens for contraindications (e.g., score NA—not applicable of this is NO function).</td>
</tr>
<tr>
<td></td>
<td>6. Reviews comfort measures and alternative instructions with patients or parents, asking questions.</td>
</tr>
<tr>
<td>B. Medical Protocols</td>
<td>1. Identifies the location of the medical protocol (i.e., immunization protocol, emergency protocol, reference material).</td>
</tr>
<tr>
<td></td>
<td>2. Determines the location of the document, in administration technique, and clinical situations where its use would be indicated.</td>
</tr>
<tr>
<td></td>
<td>3. Maintains up-to-date CPR certification.</td>
</tr>
<tr>
<td></td>
<td>4. Understands the need to report any needlestick injury and to maintain a sharp injury log.</td>
</tr>
<tr>
<td>C. Vaccine Handling</td>
<td>1. Checks expiration date. Double-checks vial label and contents prior to drawing up.</td>
</tr>
<tr>
<td></td>
<td>2. Maintains aseptic technique throughout.</td>
</tr>
<tr>
<td></td>
<td>3. Selects the correct needle size for IV and SC.</td>
</tr>
<tr>
<td></td>
<td>4. Stirs vaccine vial and/or reconstitutes and mixes using the vial supplied, and draws up correct dose of vaccine. Use label.</td>
</tr>
<tr>
<td></td>
<td>5. Labels each vial clearly with patient’s name, date, provider’s name, and expiration date.</td>
</tr>
<tr>
<td></td>
<td>6. Demonstrates knowledge of proper vaccine handling, e.g., protects MMRI from light, keeps refrigerated temperature.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Route</th>
<th>Dose</th>
<th>Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis A (HepA)</td>
<td>IM</td>
<td>0.5 mL</td>
<td>IM</td>
</tr>
<tr>
<td>Hepatitis B (HepB)</td>
<td>IM</td>
<td>10 mL</td>
<td>IM</td>
</tr>
<tr>
<td>Human papillomavirus (HPV)</td>
<td>IM</td>
<td>0.5 mL</td>
<td>IM</td>
</tr>
<tr>
<td>Influenza, live attenuated (LAIV)</td>
<td>Intranasal</td>
<td>0.2 mL</td>
<td>0.2 mL</td>
</tr>
<tr>
<td>Influenza, inactivated (IV) and inactivated (IV)</td>
<td>IM</td>
<td>0.5 mL</td>
<td>IM</td>
</tr>
<tr>
<td>Influenza (IV) Vaccine Intradermal, for ages 18 through 64 years</td>
<td>0.5 mL</td>
<td>10 mL</td>
<td></td>
</tr>
<tr>
<td>Meningococcal conglutinin (MenC)</td>
<td>IM</td>
<td>0.5 mL</td>
<td>IM</td>
</tr>
<tr>
<td>Meningococcal polysaccharide (MenB)</td>
<td>IM</td>
<td>0.5 mL</td>
<td>IM</td>
</tr>
<tr>
<td>Meningococcal polysaccharide (MenB)</td>
<td>IM</td>
<td>0.5 mL</td>
<td>IM</td>
</tr>
<tr>
<td>Meningococcal polysaccharide (MenB)</td>
<td>IM</td>
<td>0.5 mL</td>
<td>SubCut</td>
</tr>
<tr>
<td>Meningococcal polysaccharide (MenB)</td>
<td>IM</td>
<td>0.5 mL</td>
<td>SubCut</td>
</tr>
<tr>
<td>Poliomyelitis</td>
<td>IM</td>
<td>0.5 mL</td>
<td>IM</td>
</tr>
<tr>
<td>Poliovirus polysaccharide (Polio)</td>
<td>IM</td>
<td>0.5 mL</td>
<td>IM</td>
</tr>
<tr>
<td>Tetanus and Diphtheria (Td) with Pertussis</td>
<td>IM</td>
<td>0.5 mL</td>
<td>IM</td>
</tr>
<tr>
<td>Varicella (VAR)</td>
<td>IM</td>
<td>0.5 mL</td>
<td>IM</td>
</tr>
<tr>
<td>Zoster (HZV)</td>
<td>IM</td>
<td>0.5 mL</td>
<td>SubCut</td>
</tr>
</tbody>
</table>

Intramuscular (IM) injection – Use a 1” needle suitable for injection of muscle.

Intradermal (ID) injection – Use a 0.5” needle suitable for injection of skin.

Injection Site and Needle Size

<table>
<thead>
<tr>
<th>Gender/Weight</th>
<th>Needle Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female or male less than 100 lbs</td>
<td>1”</td>
</tr>
<tr>
<td>Female or male 100-150 lbs</td>
<td>1”</td>
</tr>
<tr>
<td>Female or male 150-200 lbs</td>
<td>1.5”</td>
</tr>
<tr>
<td>Female or male 200 lbs</td>
<td>1.5”</td>
</tr>
<tr>
<td>Female or male 200 lbs</td>
<td>1”</td>
</tr>
<tr>
<td>Female or male 250 lbs</td>
<td>1”</td>
</tr>
<tr>
<td>Female or male 300 lbs</td>
<td>1”</td>
</tr>
</tbody>
</table>

www.immunize.org

THE NATIONAL VACCINE PROGRAM OFFICE
Vaccine Referral Options

- **Pharmacies**

- **HealthMap Vaccine Finder** [vaccine.healthmap.org](http://vaccine.healthmap.org)
  Free online service where users can search by zip code for providers who offer vaccines.

- **Health Departments** [www.vaccines.gov/getting/where/](http://www.vaccines.gov/getting/where/)
  Check your state to see if they provide routine vaccinations or can help you identify other local vaccine providers.

- **Travel Clinics** [wwwnc.cdc.gov/travel/page/find-clinic](http://wwwnc.cdc.gov/travel/page/find-clinic)

Remind patients to check with their insurance plans regarding which providers their insurance covers for vaccination services.
Vaccine Finder

Providers and patients can find vaccine providers in their area at [http://vaccine.healthmap.org](http://vaccine.healthmap.org)
Strategies for Documentation

• Document vaccination in patients’ medical records

• Provide patients with vaccine documentation for their personal medical records, e.g. shot card

• Follow-up with patient or referring provider to document the vaccine given

• Enter immunization into city or state immunization registry
Immunization Information Systems (IIS)

- Consolidate vaccination records for your patients
- Help you assess your patients’ immunization status
- Make sure your patients have completed necessary vaccine series
- Reduce chances for unnecessary doses of vaccine or missed opportunities to provide vaccines
- Facilitate use of reminder and recall notifications to send to patients
- Make calculation of your office’s immunization coverage rates easier

www.cdc.gov/vaccines/programs/iis
Percentage of Adults Aged ≥19 Years Participating* in an Immunization Information System (IIS) – United States, Five Cities*, and the District of Columbia, 2015

National adult participation: 39%

* Participation is defined as having one or more vaccinations administered during adulthood recorded in the IIS.
Acknowledgements

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• Amy Parker-Fiebelkorn, MSN, MPH

• National Adult and Influenza Immunization Summit
Addressing Challenges in Vaccine and Vaccination Financing

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Objectives

I. Provide an Overview of Vaccine Financing in the United States

II. Review Some Challenges Facing Providers of Adult Immunization

III. Share Some Efforts to Address Barriers and Available Resources
Public & Private Sector

I. Overview of Vaccine Financing in the United States
Vaccine Financing in the United States

• Vaccines for Children (VFC, ~45% of children)
  • Entitlement for children up to age 19 served by:
    • Medicaid
    • Without health insurance
    • American Indians and Alaska Natives

• Underinsured children can receive VFC vaccines in Federally Qualified Health Centers (FQHCs) or Rural Health Clinics (RHCs)
Vaccine Financing in the United States

• Federal Government provides the vaccine and providers are paid an administration fee, based on a fee schedule.

• For children on Medicaid, the State Medicaid program pays the administration fee. The state sets the rate, based on the fee schedule.

• Section 317
  • Discretionary funding that has been stagnant
  • Has objective to improve adult IZ
Vaccine Financing in the United States

• Medicare
  • Federal health insurance for those age 65 years and older, disability, permanent kidney failure

• Coverage under:
  • Part B (named by statute) – influenza, pneumococcal, hepatitis B for high risk
  • Part D – All other vaccines (e.g. zoster)
Vaccine Financing in the United States

- Medicaid (non-VFC)
  - No cost-sharing for adults in expansion population

- State Medicaid program reimburses providers for both vaccine and administration fee.

- Reimbursement rate for administration fee is set by states

- State receives Federal match for both the vaccine and administration fee at the state’s regular match rate
Vaccine Financing in the United States

• Private sector (~50% of children)
  • Price of vaccine negotiated with purchaser (distributor/manufacturers)

• Payment negotiated with various payers

• Providers responsible for administering vaccine then seeking payment (compare with pharmaceuticals where patient fills the prescription)
II. Some Challenges Facing Adult Providers
First Dollar Coverage

• Applies to the patient perspective

• FDC means:
  – ACIP-recommended vaccines at no cost-sharing to the patient (no copays, co-insurance, deductibles)

• What does financing mean for the provider?
Managing The Business Of Vaccination: Providers

- Purchase of vaccines
- Manage inventory and associated supplies
- Payment for vaccine and vaccination services

Vaccination event
Actually More Complex

- **A.B.** Forecast demand & Purchase of vaccines
- **C.D.** Storage & management of inventory and associated supplies
- **E.** Billing of and payment for vaccine and vaccination services
- **G.** Quality improvement activities
  To improve vaccination coverage

**Providers**

**Vaccination event**

**Input data**

**EHR/IIS**

**Manufacturers**

**Payors**


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THE NATIONAL VACCINE PROGRAM OFFICE
# CDC Vaccine Price List

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Brandname/ Tradename</th>
<th>NDC</th>
<th>Packaging</th>
<th>CDC Cost/ Dose</th>
<th>Private Sector Cost/ Dose</th>
<th>Contract End Date</th>
<th>Manufacturer</th>
<th>Contract Number</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>00006-4841-41</td>
<td>10 pack – 1 dose vial</td>
<td>$25.73</td>
<td>$64.21</td>
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<td></td>
<td></td>
<td>58160-0826-52</td>
<td>10 pack - 1 dose syringe</td>
<td>$27.68</td>
<td>$63.10</td>
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</tbody>
</table>

Source:
III. Efforts to Address Challenges

National Vaccine Advisory Committee (NVAC)
National Adult Immunization Plan (NAIP)
National Adult and Influenza Immunization Summit (NAIIS)
Implementing NVAC Recommendations: Building on NVAC Work

• NVAC Pediatric Financing Working Group (March 2009)
  – “Assuring Vaccination of Children and Adolescents Without Financial Barriers”

• NVAC Adult Working Group (February 2012)
  – “A Pathway to Leadership for Adult Immunization”
The Pediatric Experience

- **Payor education:** AAP business case
- **Provider education:** Coding, reimbursement, strategies lower cost (e.g. VPG), improve practice efficiency
Focus on Providers

- **Patients**: May be unaware of recommended ACIP vaccines (not know they are fully covered under the ACA)

- **Providers**: May be learning the “business” of vaccination (not know coverage for payment and how to code)

- **Payors**: Payment for vaccine (product) and administration (services)
The (First Ever) National Adult Immunization Plan
Four Overarching Goals

**INFRASTRUCTURE**

**GOAL 1:**
Strengthen the adult immunization infrastructure

**ACCESS**

**GOAL 2:**
Improve access to adult vaccines

**DEMAND**

**GOAL 3:**
Increase community demand for adult immunizations

**INNOVATE**

**GOAL 4:**
Foster innovation in adult vaccine development and vaccination related technologies
National Adult And Influenza Immunization Summit

• **Our charge:** Determine what we can do as the NAIIS *and* as individual organizations to improve adult and influenza vaccination rates:
  – Identifying data gaps and filling them
  – Identifying barriers and addressing them

• **Working Groups**
  – Provider and Access
  – Influenza
  – Quality Measures
    • Maternal, Adult composite, ESRD

[www.izsummitpartners.org](http://www.izsummitpartners.org)
Reminder

- Coverage with no cost-sharing

- Actual dollar payments often vary by insurer and individual insurance plans

- Each claim submission requires appropriate Current Procedural Terminology (CPT®) and ICD-10-CM codes even if the insurer considers immunization a routine service
Coding and Billing for Adult Vaccinations

A common problem that has been expressed by providers of adult vaccinations has been the intricacies and complexities associated with coding and billing for those services. Much discussion at meetings of the National Adult and Influenza Immunization Summit ("Summit") has focused on opportunities to provide information to providers to reduce the errors and confusion associated with coding and billing for adult vaccines. The Summit's Access and Provider Workgroup has developed this website in response to this identified need.

At this one web location, you will find the top questions identified with coding and/or billing for adult vaccinations, scenarios that detail how to go about coding and billing for adult vaccines.

Source:
https://www.izsummitpartners.org/naiis-workgroups/access-provider-workgroup/coding-and-billing/
Manufacturers Provide Hotlines

- Many manufacturers provide hotlines to assist coders; these may also offer guidance for claims preparation, appeals, and specific payers’ vaccine coverage and reimbursement policies

- Contact your vaccine representative to learn more about their reimbursement support services
Visit IAC Resources

• **Read publications**
  • http://www.immunize.org/publications/

• **Visit websites**
  • www.immunize.org
  • www.vaccineinformation.org
  • www.izcoalitions.org
  • www.preventinfluenza.org

• **Stay ahead of the game & subscribe to updates**
  • http://www.immunize.org/subscribe/
More Information

• **Join the National Adult Immunization and Influenza Summit**
  http://www.izsummitpartners.org/

• **Attend our upcoming NVAC meeting**
  In-person or via live webcast
  http://www.hhs.gov/nvpo/nvac/meetings/upcomingmeetings/index.html

• **Visit our NVPO webpage and download the National Vaccine Plan or the National Adult Immunization Plan:**
  http://www.hhs.gov/nvpo/index.html
Many Thanks

• Mary Beth Hance, CMS

• Jeff Kelman, CMS

• Carolyn Bridges, CDC

• La Dora Woods, CDC

• LJ Tan, Immunization Action Coalition
Barriers, Examples

EXTRA SLIDES
NVAC – 9 Barriers to Adult Immunization

1. Lack of coordination of adult immunization activities
2. Lack of public knowledge
3. Lack of provider recommendations for immunization
4. Financial impediments to vaccinations
5. Lack of access to, and utilization of, health care services by adults
6. Lack of utilization of reminder or assessment systems
7. Racial/ethnic disparities
8. Health literacy
9. Concern about adverse events
Good Habits To Know…

• Document the work done in a permanent record or log:
  • Name of the vaccine and the manufacturer
  • Lot number and expiration date
  • Date of administration
  • Name, address, title and signature (electronic is acceptable) of the person administering the vaccine
  • Edition date of the Vaccine Information Statement (VIS) and date the patient or parent receives the VIS
Good Habits To Know…

• Know your payor and its rules:
  • Private payor
  • Medicare Part B
  • Medicare Part D

• Look around for the most favorable vaccine pricing, seek out group purchasing agreements to take advantage of volume discounts, and buy direct from the manufacturer

• Steps to take…
Select the Correct CPT Code for the Vaccine Administered

- Codes should accurately reflect the documentation in the patient’s medical record

- Vaccine product codes are listed in the “Medicine” section of the CPT manual

- Represented by CPT codes 90476 through 90749
  - E.g., 90736 for zoster vaccine
  - Exception for 90568 for influenza and Medicare
Add the Proper Immunization Administration CPT Code

- Every vaccine administered and billed should have a related vaccine administration service code
  - These appear in the “Medicine” section of the CPT manual

- Represented by CPT codes 90460 through 90474. Codes account for:
  - Age of the patient
  - Order and route of administration

- If Medicare, use proper G code for Part B vaccines – influenza (G0008), pneumo (G0009), hep B (G0010)
Link The Appropriate Diagnosis (ICD-10-CM) Code, Z23

- To each CPT code for the vaccine; and
- To the code for administration service
- ICD-10-CM code is now Z23 for all vaccines and vaccine services
Add Other CPT Codes…

• For any evaluation and management (E/M) services

• Other services provided during the visit. E.g., include:
  • Laboratory services
  • X-rays
  • Make sure to couple the service with the appropriate ICD-10-CM code describing why each service was performed
If Applicable, Attach the “-25” Modifier for the Outpatient Office E/M Code

• The “-25” modifier identifies a service unrelated to others performed during a patient visit. E.g.,
  • If an adolescent receives a meningococcal vaccination while seeking treatment for an injured ankle

• If the preventive medicine services codes 99381 through 99395 were used, the “-25” modifier is usually not necessary
What About Medicare Part D Vaccines?

- Payment for Part D vaccines and their administration are made solely by the participating Prescription Drug Plan.
- Physicians are considered out-of-network providers.
- Charge the patient for the vaccine and its administration and then…
- Provide patient with CMS-1500 claim form for the vaccine and administration service for patient to file.
- Enroll in TransactRx Vaccine Manager.
- Brown bagging vaccine from network pharmacy to be administered by MD; collaborative agreement between MD and pharmacy whereby vaccine given directly in the pharmacy and billed directly.
Example with Shingles in a Physician’s Office

• If patient is 60 – 64 years of age, seek coverage under patient’s private insurance

• If patient is 65 years of age and older with secondary insurance to Medicare, seek coverage under patient’s private insurance

• If patient is 65 years of age and older who have enrolled in Medicare Part D, charge patient and provide CMS-1500 form

• Use CPT code 90736 for vaccine, CPT code 90471 for the administration fee, and ICD-10 code Z23