



Adult Immunization and Standards for Immunization Practice

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Disclosures

- JoEllen Wolicki 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 the off-label use of any vaccine
- The speaker will not discuss a vaccine not currently licensed by the FDA

Overview

- Disease burden
- Standards for adult immunization practice
- Recommended Immunization Schedule for Adults
Aged 19 Years or Older, United States, 2018
- Strategies to improve vaccination coverage



Adults and Vaccine-Preventable Diseases

Adults are Vulnerable, Too!

- Invasive pneumococcal disease:
 - About 900,000 adults get pneumococcal pneumonia every year, leading to as many as 400,000 hospitalizations and 19,000 deaths
- Hepatitis B disease:
 - 700,000 to 1.4 million people suffer from chronic hepatitis B, with complications such as liver cancer
- Human papillomavirus disease:
 - HPV causes over 27,000 cancers in women and men each year
 - About 4,000 women die each year from cervical cancer

Human Papillomavirus

- HPV is a common virus, especially among young adults in their teens and early 20s.
- Human papillomavirus is the major cause of cervical cancer in women, as well as anal cancer and genital warts in both women and men. Some types of HPV can cause cancers of the penis, anus, or oropharynx (back of the throat, including base of the tongue and tonsils).
- Often people don't know they have this for years until cancer appears.

Adults and Vaccine-Preventable Diseases

- Pertussis (whooping cough):
 - ~21,000 cases reported in 2015, 22% in adults
 - Complications include pneumonia (2%), weight loss (33%), urinary incontinence (28%), syncope (6%), and rib fractures from severe coughing (4%)
- Zoster (shingles):
 - About 1 million cases of zoster annually U.S.; 10-11/1000 per year in persons 60 years of age and older¹
 - Lifetime risk 32%¹
- Influenza:
 - Disease burden varies year to year but averages millions of cases and 226,000 hospitalizations annually with >75% among adults²
 - 3,000-56,000 deaths annually, >90% among adults^{3,4}

¹Prevention of Herpes Zoster. *MMWR* 2008;57(RR-5): 1-3

²Thompson WW, et al. Influenza-Associated Hospitalizations in the United States. *JAMA* 2004;292: 1333-1340

³Estimates of deaths associated with seasonal influenza – United States, 1976-2007. *MMWR* 2010;59(33):1057-1062

⁴CDC influenza website www.cdc.gov/flu

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

Age	Averted Illnesses	Averted Medical Visits	Averted Hospitalizations
18–49 years	1,591,114	588,712	8,931
50–64 years	743,725	319,802	7,887
65 years and older	487,473	272,985	44,316

CDC website: Estimated Influenza Illnesses, Medical Visits, Hospitalizations, and Deaths Averted by Vaccination in the United States
www.cdc.gov/flu/about/disease/2015-16.htm

Flu Vaccine and Chronic Conditions

- High-risk medical conditions¹
 - 78% reduction in deaths attributable to any cause
 - 87% reduction in hospitalization attributable to acute respiratory or cardiovascular disease
- Diabetes²
 - 56% reduction in any complication, 54% reduction in hospitalizations, 58% reduction in deaths
- Chronic obstructive lung disease (COPD)^{3–4}
 - Reduced COPD exacerbation

¹Hak E. *Arch Intern Med* 2005;165:274–80. <http://dx.doi.org/10.1001/archinte.165.3.274>

²Looijmans-Van den Akkerl. *Diabetes Care* 2006;29:1771–6. <http://dx.doi.org/10.2337/dc05-2517>

³Wongsurakiat P. *Chest* 2004;125:2011–20. <http://dx.doi.org/10.1378/chest.125.6.2011>

⁴Poole PJ. *Cochrane Database SystRev* 2006;(1):CD002733

Flu Vaccine is Good for the Heart

- Acute respiratory illness or influenza-like illness increases acute MI risk 2x
- Influenza vaccine decreased cardiac events
 - 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%)”

¹Barnes M, et al. Acute myocardial infarction and influenza: a meta-analysis of case-control studies. *Heart* 2015;101:1738–1747

²Udell JA, et al. Association between influenza vaccination and cardiovascular outcomes in high-risk patients: a meta-analysis. *JAMA* 2013;310:1711–20

Real People, Real Stories—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”



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

For Health Care Professionals



2018 Immunization Schedules and Resources

Recommended Immunization Schedule for Adults Aged 19 Years or Older, 2018

Recommended Immunization Schedule for Adults Aged 19 Years or Older, United States, 2018

In February 2018, the *Recommended Immunization Schedule for Adults Aged 19 Years or Older, United States, 2018* became effective, as recommended by the Advisory Committee on Immunization Practices (ACIP) and approved by the Centers for Disease Control and Prevention (CDC). The adult immunization schedule was also approved by the American College of Physicians, the American Academy of Family Physicians, the American College of Obstetricians and Gynecologists, and the American College of Nurse-Midwives.

CDC announced the availability of the 2018 adult immunization schedule in the *Morbidity and Mortality Weekly Report (MMWR)*.¹ The schedule is published in its entirety in the *Annals of Internal Medicine*.²

The adult immunization schedule consists of figures that summarize routinely recommended vaccines for adults by age groups and medical conditions and other indications, footnotes for the figures, and a table of vaccine contraindications and precautions. Note the following when reviewing the adult immunization schedule:

- The figures in the adult immunization schedule should be reviewed with the accompanying footnotes.
- The figures and footnotes display indications for which vaccines, if not previously administered, should be administered unless noted otherwise.
- The table of contraindications and precautions identifies populations and situations for which vaccines should not be used or should be used with caution.
- When indicated, administer recommended vaccines to adults whose vaccination history is incomplete or unknown.
- Increased interval between doses of a multidose vaccine series does not diminish vaccine effectiveness; it is not necessary to restart the vaccine series or add doses to the series because of an extended interval between doses.
- Combination vaccines may be used when any component of the combination is indicated and when the other components of the combination 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.

Special populations that need additional considerations include:

- Pregnant women. Pregnant women should receive the tetanus, diphtheria, and acellular pertussis vaccine (Tdap) during pregnancy and the influenza vaccine during or before pregnancy. Live vaccines (e.g., measles, mumps, and rubella vaccine [MMR]) are contraindicated.
- Asplenia. Adults with asplenia have specific vaccination recommendations because of their increased risk for infection by encapsulated bacteria. Anatomical or functional asplenia includes congenital or acquired asplenia, splenic dysfunction, sickle cell disease and other hemoglobinopathies, and splenectomy.
- Immunocompromising conditions. Adults with immunosuppression should generally avoid live vaccines. Inactivated vaccines (e.g., pneumococcal vaccines) are generally acceptable. High-level immunosuppression includes HIV infection with a CD4 cell count <200 cells/ μ L, receipt of daily corticosteroid therapy with ≥ 20 mg of prednisone or equivalent for ≥ 14 days, primary immunodeficiency disorder (e.g., severe combined immunodeficiency or complement component deficiency), and receipt of cancer chemotherapy. Other immunocompromising conditions and immunosuppressive medications to consider when vaccinating adults can be found in *IDSA Clinical Practice Guideline for Vaccination of the Immunocompromised Host*.³ Additional information on vaccinating immunocompromised adults is in *General Best Practice Guidelines for Immunization*.⁴

Additional resources for health care providers include:

- Details on vaccines recommended for adults and complete ACIP statements at www.cdc.gov/vaccines/hcp/acip-recs/index.html
- Vaccine Information Statements that explain benefits and risks of vaccines at www.cdc.gov/vaccines/hcp/vis/index.html
- Information and resources on vaccinating pregnant women at www.cdc.gov/vaccines/adults/rec-vac/pregnant.html
- Information on travel vaccine requirements and recommendations at www.cdc.gov/travel/destinations/list
- CDC Vaccine Schedules App for immunization service providers to download at www.cdc.gov/vaccines/schedules/hcp/schedule-app.html
- Adult Vaccination Quiz for self-assessment of vaccination needs based on age, health conditions, and other indications at www2.cdc.gov/nip/adultimmsched/default.asp
- *Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger* at www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html

Report suspected cases of reportable vaccine-preventable diseases to the local or state health department, and report all clinically significant postvaccination events to the Vaccine Adverse Event Reporting System at www.vaers.hhs.gov or by telephone, 800-822-7967. All vaccines included in the adult immunization schedule except 23-valent pneumococcal polysaccharide and zoster 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 to CDC through www.cdc.gov/cdc-info or by telephone, 800-CDC-INFO (800-232-4636), in English and Spanish, 8:00am–8:00pm ET, Monday–Friday, excluding holidays.

The following abbreviations are used for vaccines in the adult immunization schedule (in the order of their appearance):

IIV	inactivated influenza vaccine
RIV	recombinant influenza vaccine
Tdap	tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine
Td	tetanus and diphtheria toxoids
MMR	measles, mumps, and rubella vaccine
VAR	varicella vaccine
RZV	recombinant zoster vaccine
ZVL	zoster vaccine live
HPV vaccine	human papillomavirus vaccine
PCV13	13-valent pneumococcal conjugate vaccine
PPSV23	23-valent pneumococcal polysaccharide vaccine
HepA	hepatitis A vaccine
HepA-HepB	hepatitis A vaccine and hepatitis B vaccine
HepB	hepatitis B vaccine
MenACWY	serogroups A, C, W, and Y meningococcal vaccine
MenB	serogroup B meningococcal vaccine
Hib	<i>Haemophilus influenzae</i> type b vaccine

1. MMWR Morb Mortal Wkly Rep. 2018;66(5):xx–xx. Available at www.cdc.gov/mmwr/volumes/67/xxxxxxx.

2. Ann Intern Med. 2018;168:xxx–xxx. Available at annals.org/aim/article/doi/10.7326/M17-3439.

3. Clin Infect Dis. 2014;58:e44–100. Available at www.idsociety.org/Templates/Content.aspx?id=32212256011.

4. Kroger et al. Available at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html.



U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Figure 1. Recommended immunization schedule for adults aged 19 years or older by age group, United States, 2018

This figure should be reviewed with the accompanying footnotes. This figure and the footnotes describe indications for which vaccines, if not previously administered, should be administered unless noted otherwise.

Vaccine	19–21 years	22–26 years	27–49 years	50–64 years	≥65 years
Influenza¹	1 dose annually				
Tdap² or Td²	1 dose Tdap, then Td booster every 10 yrs				
MMR³	1 or 2 doses depending on indication (If born in 1957 or later)				
VAR⁴	2 doses				
RZV⁵ (preferred) or ZVL⁵				2 doses RZV (preferred) or 1 dose ZVL	
HPV—Female⁶	2 or 3 doses depending on age at series initiation				
HPV—Male⁶	2 or 3 doses depending on age at series initiation				
PCV13⁷	1 dose				
PPSV23⁷	1 or 2 doses depending on indication				
HepA⁸	2 or 3 doses depending on vaccine				
HepB⁹	3 doses				
MenACWY¹⁰	1 or 2 doses depending on indication, then booster every 5 yrs if risk remains				
MenB¹⁰	2 or 3 doses depending on vaccine				
Hib¹¹	1 or 3 doses depending on indication				



Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection



Recommended for adults with other indications



No recommendation

Figure 2. Recommended immunization schedule for adults aged 19 years or older by medical condition and other indications, United States, 2018

This figure should be reviewed with the accompanying footnotes. This figure and the footnotes describe indications for which vaccines, if not previously administered, should be administered unless noted otherwise.

Vaccine	Pregnancy ¹⁻⁶	Immuno-compromised (excluding HIV infection) ^{3-7,11}	HIV infection CD4+ count (cells/ μ L) ^{3-7,9-10}		Asplenia, complement deficiencies ^{7,10,11}	End-stage renal disease, on hemodialysis ^{7,9}	Heart or lung disease, alcoholism ⁷	Chronic liver disease ⁷⁻⁹	Diabetes ^{7,9}	Health care personnel ^{3,4,9}	Men who have sex with men ^{6,8,9}																	
			<200	≥ 200																								
Influenza ¹			1 dose annually																									
Tdap ² or Td ²	1 dose Tdap each pregnancy		1 dose Tdap, then Td booster every 10 yrs																									
MMR ³	contraindicated			1 or 2 doses depending on indication																								
VAR ⁴	contraindicated			2 doses																								
RZV ⁵ (preferred) or ZVL ⁵					2 doses RZV at age ≥ 50 yrs (preferred) or 1 dose ZVL at age ≥ 60 yrs																							
HPV–Female ⁶		3 doses through age 26 yrs			2 or 3 doses through age 26 yrs																							
HPV–Male ⁶		3 doses through age 26 yrs			2 or 3 doses through age 21 yrs								2 or 3 doses through age 26 yrs															
PCV13 ⁷		1 dose																										
PPSV23 ⁷		1, 2, or 3 doses depending on indication																										
HepA ⁸	2 or 3 doses depending on vaccine																											
HepB ⁹	3 doses																											
MenACWY ¹⁰				1 or 2 doses depending on indication, then booster every 5 yrs if risk remains																								
MenB ¹⁰		2 or 3 doses depending on vaccine																										
Hib ¹¹		3 doses HSCT recipients only			1 dose																							

Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection
 Recommended for adults with other indications
 Contraindicated
 No recommendation

Footnotes. Recommended immunization schedule for adults aged 19 years or older, United States, 2018

1. Influenza vaccination

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/flu.html

General information

- Administer 1 dose of age-appropriate inactivated influenza vaccine (IIV) or recombinant influenza vaccine (RIV) annually
- Live attenuated influenza vaccine (LAIV) is not recommended for the 2017–2018 influenza season
- A list of currently available influenza vaccines is available at www.cdc.gov/flu/protect/vaccine/vaccines.htm

Special populations

- Administer age-appropriate IIV or RIV to:
 - **Pregnant women**
 - Adults with **hives-only egg allergy**
 - Adults with **egg allergy other than hives** (e.g., angioedema or respiratory distress): Administer IIV or RIV in a medical setting under supervision of a health care provider who can recognize and manage severe allergic conditions

2. Tetanus, diphtheria, and pertussis vaccination

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/tdap-td.html

General information

- Administer to adults who previously did not receive a dose of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) as an adult or child (routinely recommended at age 11–12 years) 1 dose of Tdap, followed by a dose of tetanus and diphtheria toxoids (Td) booster every 10 years
- Information on the use of Tdap or Td as tetanus prophylaxis in wound management is available at www.cdc.gov/mmwr/preview/mmwrhtml/rr5517a1.htm

Special populations

- **Pregnant women:** Administer 1 dose of Tdap during each pregnancy, preferably in the early part of gestational weeks 27–36

3. Measles, mumps, and rubella vaccination

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mmr.html

General information

- Administer 1 dose of measles, mumps, and rubella vaccine (MMR) to adults with no evidence of immunity to measles, mumps, or rubella
- Evidence of immunity is:
 - Born before 1957 (except for health care personnel, see below)
 - Documentation of receipt of MMR
 - Laboratory evidence of immunity or disease
- Documentation of a health care provider-diagnosed disease without laboratory confirmation is not considered evidence of immunity

Special populations

- **Pregnant women and nonpregnant women of childbearing age** with no evidence of immunity to rubella: Administer 1 dose of MMR (if pregnant, administer MMR after pregnancy and before discharge from health care facility)

- **HIV infection and CD4 cell count ≥ 200 cells/ μ L for at least 6 months** and no evidence of immunity to measles, mumps, or rubella: Administer 2 doses of MMR at least 28 days apart
- **Students in postsecondary educational institutions, international travelers, and household contacts of immunocompromised persons:** Administer 2 doses of MMR at least 28 days apart (or 1 dose of MMR if previously administered 1 dose of MMR)
- **Health care personnel born in 1957 or later** with no evidence of immunity: Administer 2 doses of MMR at least 28 days apart for measles or mumps, or 1 dose of MMR for rubella (if born before 1957, consider MMR vaccination)
- **Adults who previously received ≤ 2 doses of mumps-containing vaccine and are identified by public health authority to be at increased risk for mumps in an outbreak:** Administer 1 dose of MMR
- MMR is contraindicated for pregnant women and adults with severe immunodeficiency

4. Varicella vaccination

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/varicella.html

General information

- Administer to adults without evidence of immunity to varicella 2 doses of varicella vaccine (VAR) 4–8 weeks apart if previously received no varicella-containing vaccine (if previously received 1 dose of varicella-containing vaccine, administer 1 dose of VAR at least 4 weeks after the first dose)
- Evidence of immunity to varicella is:
 - U.S.-born before 1980 (except for pregnant women and health care personnel, see below)
 - Documentation of receipt of 2 doses of varicella or varicella-containing vaccine at least 4 weeks apart
 - Diagnosis or verification of history of varicella or herpes zoster by a health care provider
 - Laboratory evidence of immunity or disease

Special populations

- Administer 2 doses of VAR 4–8 weeks apart if previously received no varicella-containing vaccine (if previously received 1 dose of varicella-containing vaccine, administer 1 dose of VAR at least 4 weeks after the first dose) to:
 - **Pregnant women without evidence of immunity:** Administer the first of the 2 doses or the second dose after pregnancy and before discharge from health care facility
 - **Health care personnel without evidence of immunity**
- **Adults with HIV infection and CD4 cell count ≥ 200 cells/ μ L:** May administer, based on individual clinical decision, 2 doses of VAR 3 months apart
- VAR is contraindicated for pregnant women and adults with severe immunodeficiency

5. Zoster vaccination

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/shingles.html

General information

- Administer 2 doses of recombinant zoster vaccine (RZV) 2–6 months apart to adults aged 50 years or older regardless of past episode of herpes zoster or receipt of zoster vaccine live (ZVL)

- Administer 2 doses of RZV 2–6 months apart to adults who previously received ZVL at least 2 months after ZVL
- For adults aged 60 years or older, administer either RZV or ZVL (RZV is preferred)

Special populations

- ZVL is contraindicated for pregnant women and adults with severe immunodeficiency

6. Human papillomavirus vaccination

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/hpv.html

General information

- Administer human papillomavirus (HPV) vaccine to **females through age 26 years and males through age 21 years** (males aged 22 through 26 years may be vaccinated based on individual clinical decision)
- The number of doses of HPV vaccine to be administered depends on age at initial HPV vaccination
 - **No previous dose of HPV vaccine:** Administer 3-dose series at 0, 1–2, and 6 months (minimum intervals: 4 weeks between doses 1 and 2, 12 weeks between doses 2 and 3, and 5 months between doses 1 and 3; repeat doses if given too soon)
 - **Aged 9–14 years at HPV vaccine series initiation and received 1 dose or 2 doses less than 5 months apart:** Administer 1 dose
 - **Aged 9–14 years at HPV vaccine series initiation and received 2 doses at least 5 months apart:** No additional dose is needed

Special populations

- **Adults with immunocompromising conditions (including HIV infection)** through age 26 years: Administer 3-dose series at 0, 1–2, and 6 months
- **Men who have sex with men** through age 26 years: Administer 2- or 3-dose series depending on age at initial vaccination (see above); if no history of HPV vaccine, administer 3-dose series at 0, 1–2, and 6 months
- **Pregnant women** through age 26 years: HPV vaccination is not recommended during pregnancy, but there is no evidence that the vaccine is harmful and no intervention needed for women who inadvertently receive HPV vaccine while pregnant; delay remaining doses until after pregnancy; pregnancy testing is not needed before vaccination

7. Pneumococcal vaccination

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/pneumo.html

General information

- Administer to immunocompetent adults aged 65 years or older 1 dose of 13-valent pneumococcal conjugate vaccine (PCV13), if not previously administered, followed by 1 dose of 23-valent pneumococcal polysaccharide vaccine (PPSV23) at least 1 year after PCV13; if PPSV23 was previously administered but not PCV13, administer PCV13 at least 1 year after PPSV23
- When both PCV13 and PPSV23 are indicated, administer PCV13 first (PCV13 and PPSV23 should not be administered during the same visit); additional information on vaccine timing is available at www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf

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 recipients.

Contraindications and precautions for vaccines routinely recommended for adults

Vaccine(s)	Contraindications	Precautions
All vaccines routinely recommended for adults	<ul style="list-style-type: none"> Severe reaction, e.g., anaphylaxis, after a previous dose or to a vaccine component 	<ul style="list-style-type: none"> Moderate or severe acute illness with or without fever

Additional contraindications and precautions for vaccines routinely recommended for adults

Vaccine(s)	Additional Contraindications	Additional Precautions
IIIV ¹		<ul style="list-style-type: none"> History of Guillain-Barré syndrome within 6 weeks after previous influenza vaccination Egg allergy other than hives, e.g., angioedema, respiratory distress, lightheadedness, or recurrent emesis; or required epinephrine or another emergency medical intervention (IIIV may be administered in an inpatient or outpatient medical setting and under the supervision of a health care provider who is able to recognize and manage severe allergic conditions)
RIV ¹		<ul style="list-style-type: none"> History of Guillain-Barré syndrome within 6 weeks after previous influenza vaccination
Tdap, Td	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Guillain-Barré syndrome within 6 weeks after a previous dose of tetanus toxoid-containing vaccine History of Arthus-type hypersensitivity reactions after a previous dose of tetanus or diphtheria toxoid-containing vaccine. Defer vaccination until at least 10 years have elapsed since the last tetanus toxoid-containing vaccine For pertussis-containing vaccine, progressive or unstable neurologic disorder, uncontrolled seizures, or progressive encephalopathy (until a treatment regimen has been established and the condition has stabilized)
MMR ²	<ul style="list-style-type: none"> Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy³, human immunodeficiency virus (HIV) infection with severe immunocompromise Pregnancy 	<ul style="list-style-type: none"> Recent (within 11 months) receipt of antibody-containing blood product (specific interval depends on product)⁴ History of thrombocytopenia or thrombocytopenic purpura Need for tuberculin skin testing⁵
VAR ²	<ul style="list-style-type: none"> Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy³, HIV infection with severe immunocompromise Pregnancy 	<ul style="list-style-type: none"> Recent (within 11 months) receipt of antibody-containing blood product (specific interval depends on product)⁴ Receipt of specific antiviral drugs (acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination (avoid use of these antiviral drugs for 14 days after vaccination)
ZVL ²	<ul style="list-style-type: none"> Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy³, HIV infection with severe immunocompromise Pregnancy 	<ul style="list-style-type: none"> Receipt of specific antiviral drugs (acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination (avoid use of these antiviral drugs for 14 days after vaccination)
HPV vaccine		<ul style="list-style-type: none"> Pregnancy
PCV13	<ul style="list-style-type: none"> Severe allergic reaction to any vaccine containing diphtheria toxoid 	

1. For additional information on use of influenza vaccines among persons with egg allergy, see: CDC. Prevention and control of seasonal influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices—United States, 2016–17 influenza season. MMWR. 2016;65(RR-5):1–54. Available at www.cdc.gov/mmwr/volumes/65/rr/rr6505a1.htm.

2. MMR may be administered together with VAR or ZVL on the same day. If not administered on the same day, separate live vaccines by at least 28 days.

3. Immunosuppressive steroid dose is considered to be daily receipt of 20 mg or more prednisone or equivalent for 2 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: Best practices guidance of the Advisory Committee on Immunization Practices (ACIP). Available at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html.

5. Measles vaccination may temporarily suppress tuberculin reactivity. Measles-containing vaccine may be administered on the same day as tuberculin skin testing, or should be postponed for at least 4 weeks after vaccination.

* Adapted from: CDC. Table 6. Contraindications and precautions to commonly used vaccines. General recommendations on immunization: recommendations of the Advisory Committee on Immunization Practices. MMWR. 2011;60(No. RR-2):40–1 and from: Hamborsky J, Kroger A, Wolfe S, eds. Appendix A. Epidemiology and prevention of vaccine preventable diseases. 13th ed. Washington, DC: Public Health Foundation, 2015. Available at www.cdc.gov/vaccines/pubs/pinkbook/index.html.

Abbreviations of vaccines

IIIV	inactivated influenza vaccine	VAR	varicella vaccine	HepA	hepatitis A vaccine
RIV	recombinant influenza vaccine	RZV	recombinant zoster vaccine	HepA-HepB	hepatitis A and hepatitis B vaccines
Tdap	tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine	ZVL	zoster vaccine live	HepB	hepatitis B vaccine
Td	tetanus and diphtheria toxoids	HPV vaccine	human papillomavirus vaccine	MenACWY	serogroups A, C, W, and Y meningococcal vaccine
MMR	measles, mumps, and rubella vaccine	PCV13	13-valent pneumococcal conjugate vaccine	MenB	serogroup B meningococcal vaccine
		PPSV23	23-valent pneumococcal polysaccharide vaccine	Hib	<i>Haemophilus influenzae</i> type b vaccine

Recommended Immunization Schedule for Adults Aged 19 Years or Older, 2018

- “Syndication”
 - Display immunization schedules on your website
 - You will see the CDC words and images display within your web page
 - Nothing else changes on your web page
- CDC vaccine schedule app
 - Complete schedule including medical conditions and footnotes
 - For smartphone and tablet devices
 - Free downloads are available from the iTunes App Store and Google Play
 - 2018 version of the schedules App will be available in early March

Updates/Changes to this Year's Schedule

- Tdap/Td:
 - “Td/Tdap” has been replaced by “Tdap or Td” on Figures 1 and 2 and the text in the indication bar has been revised to “1 dose Tdap, then Td booster every 10 years.”
- HPV:
 - Figure 1, the text in the indication bar for HPV in Figure 1 vaccine for females and males has been revised to “2 or 3 doses depending on age at series initiation.”
- MMR:
 - Administer 1 dose of MMR to adults who previously received ≤ 2 doses of mumps-containing vaccine and are identified by a public health authority to be at increased risk during a mumps outbreak.
 - The text in the indication bar for MMR in Figure 1 for has been changed to “1 or 2 doses depending on indication (if born in 1957 or later).”

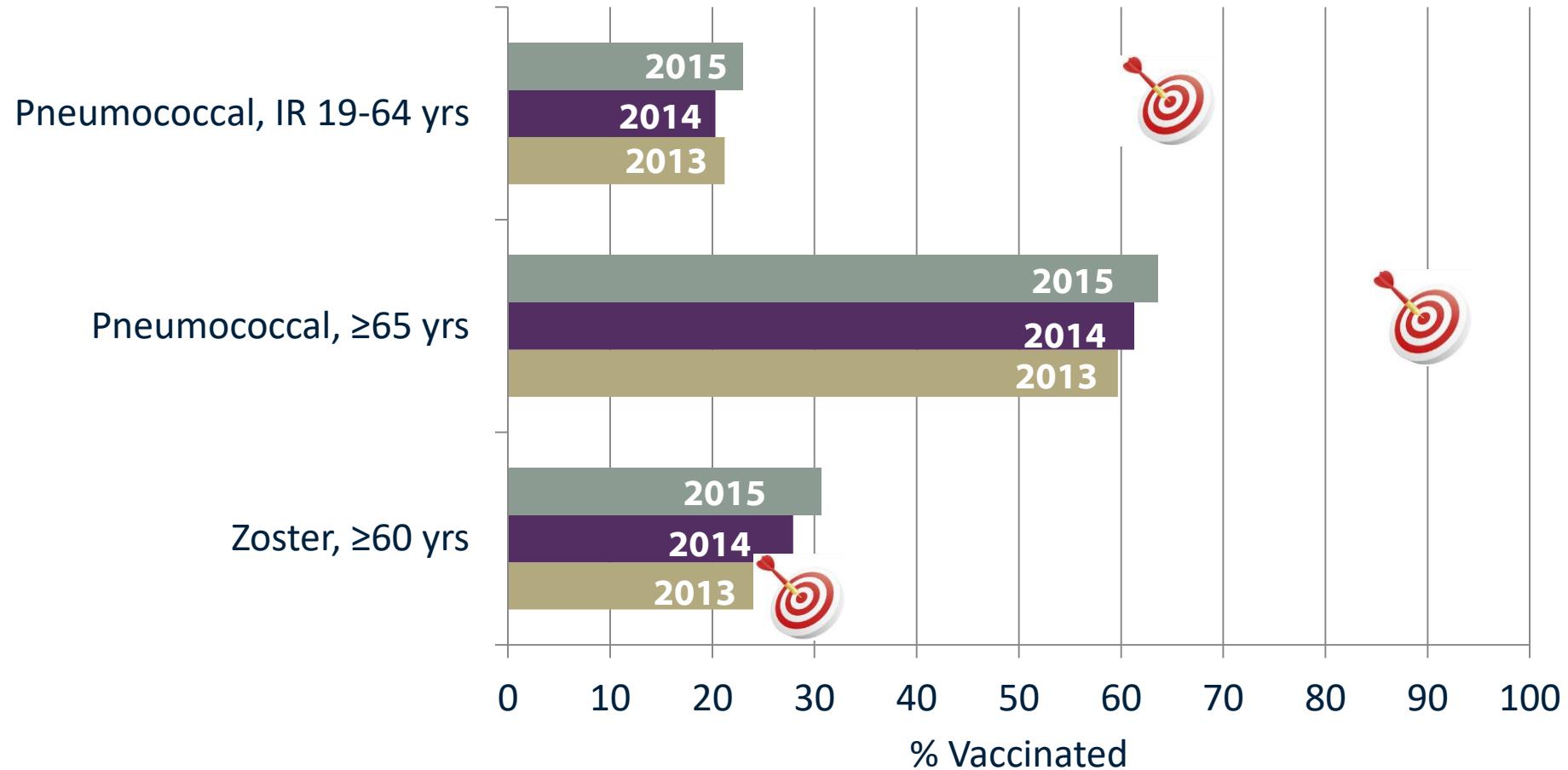
Updates/Changes to this Year's Schedule

- MenACWY:
 - In Figures 1 and 2, the text in the indication bar for MenACWY (serogroups A, C, W, and Y meningococcal vaccine) has been revised to “1 or 2 doses depending on indication, then booster every 5 years if risk remains.”
 - MPSV4 (4-valent meningococcal polysaccharide vaccine) is no longer available and has been removed from the adult immunization schedule.
- Zoster:
 - Administer 2 doses of recombinant zoster vaccine (RZV, Shingrix) 2–6 months apart to adults aged 50 years or older regardless of past episode of herpes zoster or receipt of zoster vaccine live (ZVL, Zostavax).
 - Administer 2 doses of RZV 2–6 months apart to adults who previously received ZVL at least 2 months after ZVL.
 - For adults aged 60 years or older, administer either RZV or ZVL (RZV is preferred).
 - “ZVL” has replaced the term “HZV” (herpes zoster vaccine) that was used in past adult immunization schedules to refer to the live zoster vaccine. A row for RZV was added above the row for ZVL and a dashed line was used to separate RZV and ZVL rows to denote that the two zoster vaccines are recommended for the same purpose.

Adult Immunization Rates

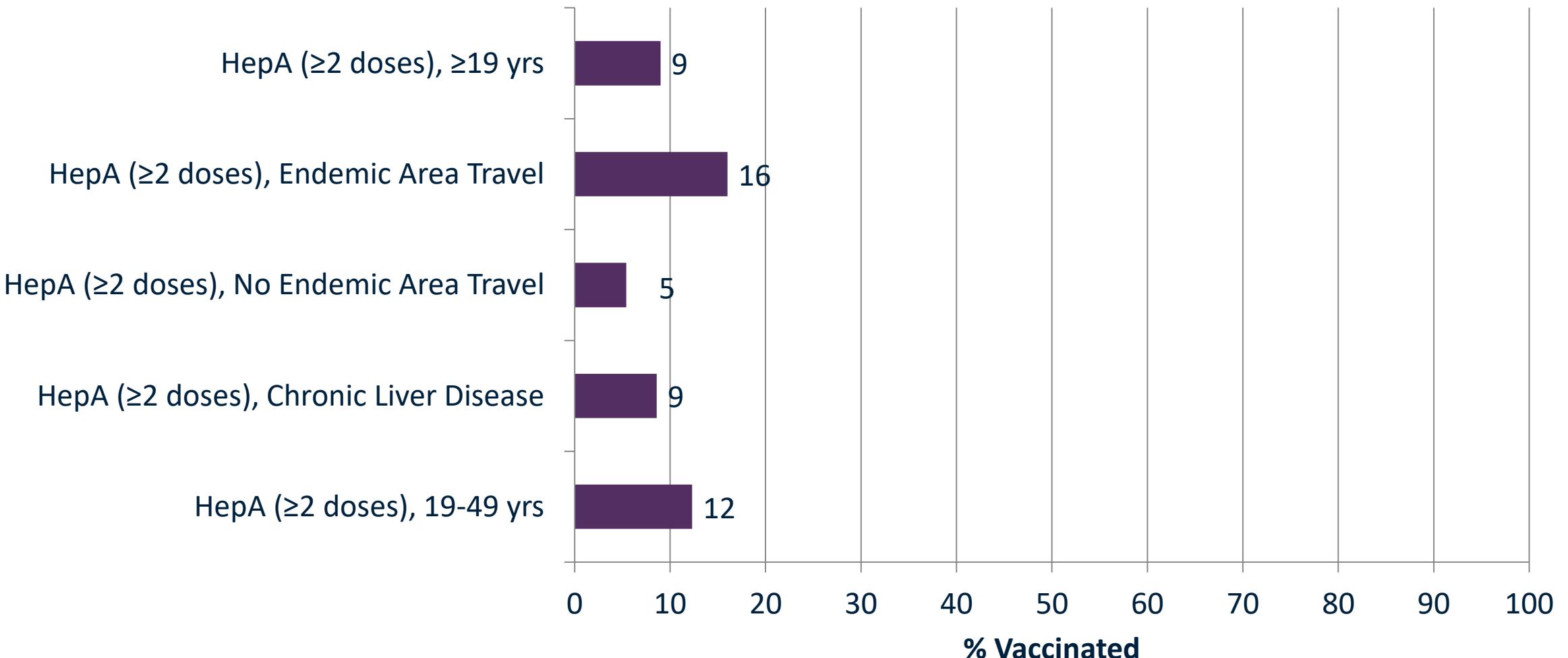


Adult Immunization Coverage, Selected Vaccines by Age and Increased-Risk Status, 2013-2015, United States



HP 2020 Targets: 90% PPV ≥ 65 years, 60% PPV IR 19-64 years, 30% zoster ≥ 60 years

Hepatitis A Vaccination Coverage by Age and High-Risk Status, United States

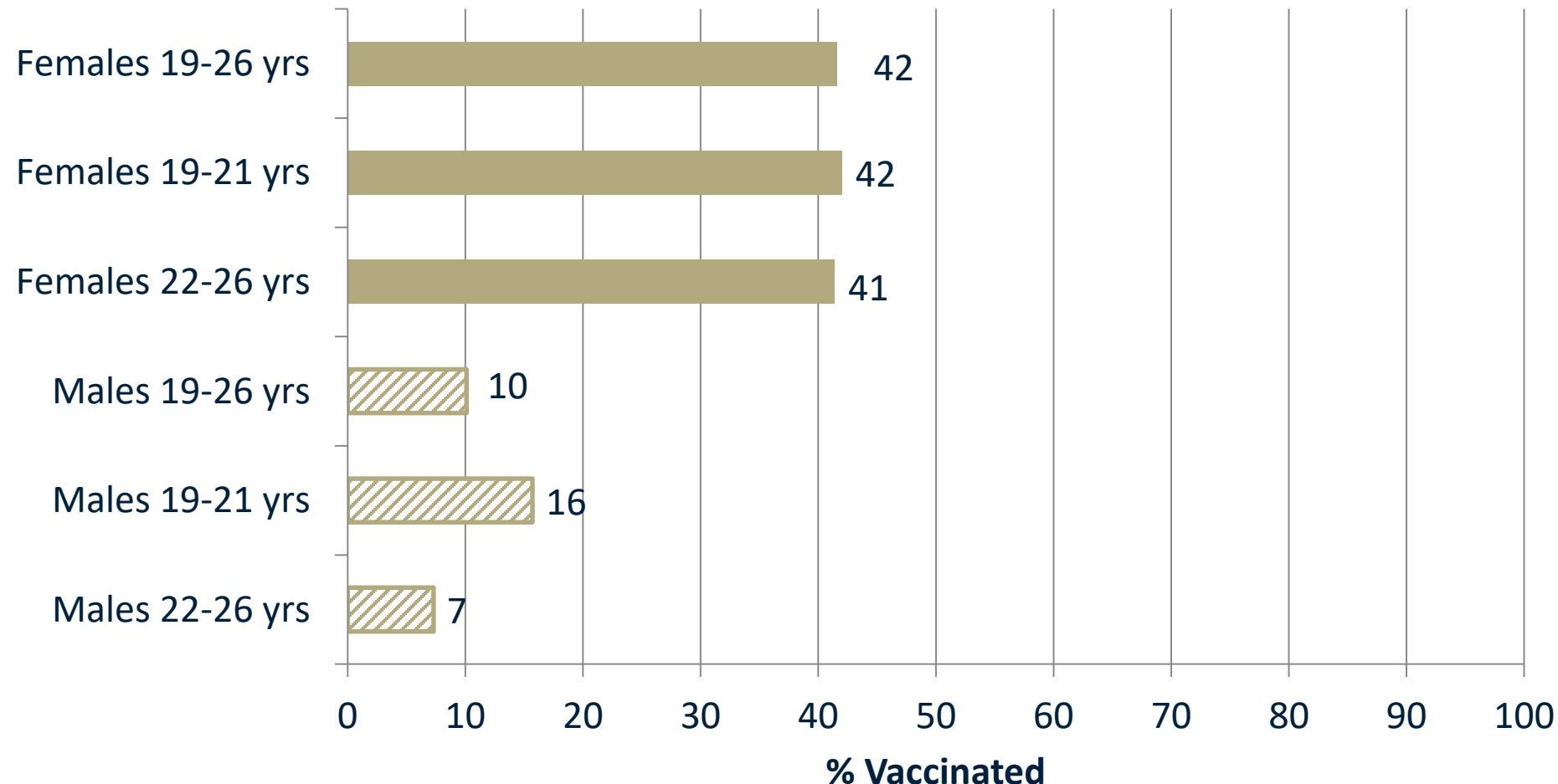


Proportion of Adults 19 Years of Age and Older Who Received Tdap Vaccine

Group	Tdap/Td+Tdap
Adults, ≥ 19 years, Overall	72
HCP, ≥ 19 years	78*
Non-HCP, ≥ 19 years	71

*p<0.05 by t test for comparisons between HCP and non-HCP ≥ 19 years

HPV Vaccination Coverage (at Least 1 Dose Ever), Adults 19-26 Years of Age by Sex, United States



Vaccination Coverage Among Older Adults, by Race/Ethnicity, 2015

	Influenza Adults ≥65 years 2014–2015	Pneumonia Adults ≥65 years 2015	Tdap Adults ≥65 years 2015	Zoster Adults ≥60 years 2015
White	75.1%	68.1%	18.2%	34.6%
Black	64.3%	50.2%	9.7%	13.6%
Hispanic	64.1%	41.7%	9.1%	16.0%
Asian	83.5%	49.0%	13.8%	26.0%
Other	77.2%	62.7%	n/a	28.0%
Overall	73.5%	63.6%	16.5%	30.6%

Standards for Adult Immunization Practice



Overview

A Series on Standards for Adult Immunization Practice

In 2012, the National Vaccine Advisory Committee updated its Standards for Adult Immunization Practice to reflect the on-call need for ALL healthcare professionals—whether they provide immunization services or not—to take steps to ensure that adult patients get the vaccines they need.

Patients trust you to give them the best advice on how to protect their health.
Make adult vaccination a standard of care in your practice.

Why should adult immunization be a priority for your practice?

1. Your patients are probably not getting the vaccines they need. Even though most private insurance plans cover the cost of recommended vaccines, adult vaccination rates in the United States are extremely low. Each year less than thousands of adults needlessly suffer, are hospitalized, and even die as a result of diseases that could be prevented by vaccines.
2. Your patients are likely not aware that they need vaccines. Although many adults believe immunization is important, a recent national survey showed that most adults are not aware that they need vaccines throughout their lives to protect against diseases like shingles, pneumonia, and hepatitis. Many also report not receiving vaccine recommendations from their healthcare professionals.
3. You play a critical role in ensuring that your patients are fully immunized. Clinicians are the most valued and trusted source of health information for adults. Patients rely on you to inform them about the vaccines they need. Research shows that a recommendation from their healthcare professional is the top predictor of patients getting vaccinated.

2012 U.S. Adult Vaccination Rates

Only 14% of adults 19 years or older had received shingles vaccination. Over 48,000 cases of pneumonia were reported in 2012—and many more cases may have gone unreported. About one in 100 adults with pneumonia are hospitalized and others may have complications, which could include pneumonia, bronchitis, and sinusitis. Illness and death from pneumonia make it critical for pregnant women to get vaccinated in every pregnancy.

Only 20% of adults 65 years or older had received shingles vaccination. Nearly 1 million Americans experience the condition each year, and about half of all cases occur in adults 65 years or older. Older adults are also most likely to experience severe pain from the disease and have postherpetic neuralgia.

Only 20% of adults 19 to 64 years at high risk had received pneumonia vaccination. While coverage among adults 65 years or older is better, there are still many adults left unprotected. There were approximately 32,000 cases of invasive pneumococcal disease in 2012, and about 3,000 of these resulted in death.

SOURCE: CDC's National Immunization Survey (NIS).

DON'T WAIT. VACCINATE!

Information for Adults: www.cdc.gov/acip
Information for Clinicians: www.cdc.gov/acip

www.cdc.gov/vaccines/AdultStandards

Standards for Adult Immunization Practice

- Developed in 1990 to improve vaccine delivery to adults, updated in 2014 by National Vaccine Advisory Committee (NVAC)
- All HCPs, including those who do not provide vaccination services, have role in ensuring patients up to date on vaccines
- Call to action:
 - 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 immunization information systems

Assess for Needed Vaccines

- Assessment is the critical first step in ensuring that your adult patients get the vaccines they need for protection against serious vaccine-preventable diseases.
- Your patients' vaccination needs will change over time based on factors such as:
 - Age
 - Health conditions
 - Lifestyle
 - Occupation
 - Travel
- Adults think immunization is important, but most are not aware of all the vaccines they need. They rely on HCP to tell them which vaccines are recommended for them.

Recommend Needed Vaccines

- Strongly recommend vaccines that your patients need, whether your office stocks them or not.
- Your recommendation can make a difference.
- Clinicians are the most valued and trusted source of health information for adults.
- Adults believe that vaccines are important, but many are not aware of all the vaccines they need.

Strong Recommendation

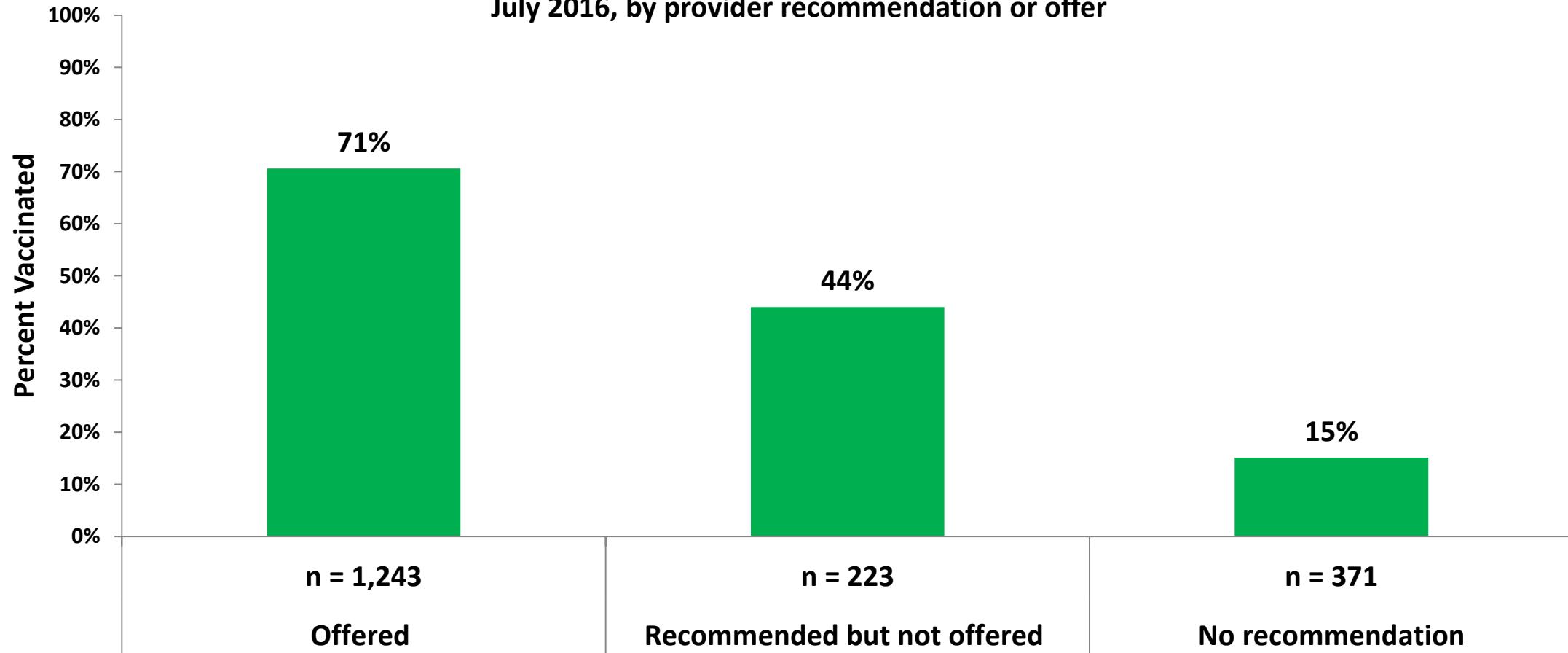
- Strong provider recommendation for vaccines has been shown in numerous studies to be a key factor in the patient's decision to vaccinate or not
- Framing a strong recommendation = Same way and same day!
 - “Bundle recommendation”: an effective recommendation includes all needed vaccines
 - “Today, you need 2 vaccines- flu and pneumococcal vaccines. These vaccine will protect you from influenza and invasive pneumococcal disease. We'll give you those shots today.”

Administer Needed Vaccines

- Recommend and offer vaccines at the same visit.
- Research shows that when patients receive a vaccine recommendation and are offered the vaccine at the same time, they are more likely to get vaccinated.
- For vaccines you don't stock, REFER patients to a local immunization provider that can vaccinate.

Vaccination Uptake by Provider Recommendation and Offer

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



Keeping All Staff On the Same Page

- Align consistent immunization messages for ALL staff
- Communicate with mission
 - All staff need to be saying the same thing
 - Create/share talking points
 - Educate staff about vaccine recommendations including schedule, administration, storage and handling

Document Vaccinations

- Keep an up-to-date record of the vaccines your patients have received to make sure they have the best protection against vaccine-preventable diseases.
- To ensure patients get the vaccines they need and to prevent unnecessary vaccination, you should:
 - Record vaccinations in patients' medical records.
 - Provide documentation of vaccines received to patients for their personal records.
 - Document vaccinations in immunization information systems (IISs).

Documenting Vaccination and Immunization Records

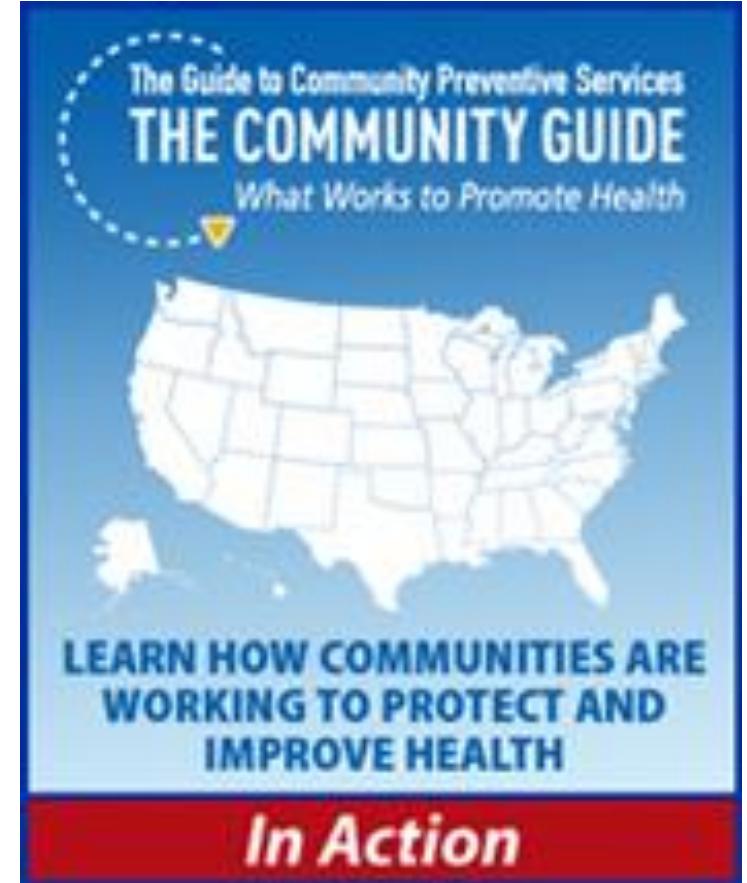
- Federal law requires the following information must be documented on the patient's paper or electronic medical record or on a permanent office log the:
 - Vaccine manufacturer
 - Vaccine lot number
 - Date the vaccine is administered
 - Name, office address, and title of the health care provider administering the vaccine
 - Vaccine information statement (VIS) edition date located in the lower right corner on the back of the VIS
 - Date the VIS is given to the patient, parent, or guardian
- Some states and/or local jurisdictions have additional requirements



Evidence-Based Strategies to Improve Vaccination Rates

Components of Successful Vaccination Programs

- Strategies shown to improve coverage:
 - Reduce missed opportunities
 - Integrate standing orders
 - Use reminder prompts to providers
 - Educate clinicians and staff
 - Use a patient reminder–recall system
 - Use immunization information systems (IISs)
- Use a combination of strategies



www.thecommunityguide.org/vaccines/index.html

Missed Opportunities

- Missed opportunity: a health care encounter in which a person is eligible to receive vaccination but is not vaccinated completely
- Reasons cited for missed opportunities:
 - Lack of simultaneous administration
 - Unaware the patient needs additional vaccines
 - Invalid contraindications
 - Inappropriate clinic policies
 - Reimbursement deficiencies

Standing Orders

- Standing orders authorize nurses, pharmacists, and other appropriately trained healthcare personnel, where allowed by state law, to assess a patient's immunization status and administer vaccinations according to a protocol approved by an institution, physician, or other authorized clinician.
- Standing orders enable staff to assess and vaccinate patients without the need for clinician examination or direct order from the attending provider at the time of the visit.

Knowledgeable Staff

- Before administering vaccines, all personnel who will administer vaccines should:
 - Receive competency-based training
 - Have knowledge and skills validated
- Integrate competency-based training into:
 - New staff orientation
 - Annual education requirements
- Ongoing education:
 - Whenever vaccine administration recommendations are updated
 - When new vaccines are added to inventory



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** columns. 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 desired actions or write in others.

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

		Self-Assessment		Supervisor Review		
Competency	Clinical Skills, Techniques, and Procedures	Need to Improve	Meets or Exceeds	Need to Improve	Meets or Exceeds	Plan of Action*
A. Patient/Parent Education	1. Welcomes patient/family, establishes rapport, and answers any questions.					
	2. Explains what vaccines will be given and which type(s) of injection will be done.					
	3. Accommodates language or literacy barriers and special needs of patient/parents to help make them feel comfortable and informed about the procedure.					
	4. Verifies patient/parents received the Vaccine Information Statements for indicated vaccines and had time to read them and ask questions.					
	5. Screens for contraindications. (MA: score NA-not applicable-if this is MD function.)					
	6. Reviews comfort measures and after care instructions with patient/parents, inviting questions.					
B. Medical Protocols	1. Identifies the location of the medical protocols (i.e. immunization protocol, emergency protocol, reference material).					
	2. Identifies the location of the epinephrine, its administration technique, and clinical situations where its use would be indicated.					
	3. Maintains up-to-date CPR certification.					
	4. Understands the need to report any needlestick injury and to maintain a sharps injury log.					
C. Vaccine Handling	1. Checks vial expiration date. Double-checks vial label and contents prior to drawing up.					
	2. Maintains aseptic technique throughout.					
	3. Selects the correct needle size for IM and SC.					
	4. Shakes vaccine vial and/or reconstitutes and mixes using the diluent supplied. Inverts vial and draws up correct dose of vaccine. Redchecks vial label.					
	5. Labels each filled syringe or uses labeled tray to keep them identified.					
	6. Demonstrates know logs refrigerator tem					

Adapted from California Department of Public Health • Immunization Branch
Immunization Action Coalition • Saint Paul, Minnesota •

Skills checklist for immunization

immunize.org/catg.d/p7010.pdf • Item #P7010 (2/14) page 1 of 2

CDC Resources for Staff Education

- Multiple education products available free through the CDC website:
 - You Call the Shots self-study modules
 - Netconferences
 - Next one: March 21, 2018
 - Immunization courses (webcasts and online self-study)
- Continuing education available

CDC A-Z INDEX ▾

Immunization Education & Training

Education and Training Home

You Call The Shots

Current Issues in Immunization NetConferences (CIINC)

Immunization Courses

Continuing Education

Pink Book Webinars

Patient Education

Quality Improvement Projects

Related Link

Vaccines & Immunizations

VIS

ACIP Recommendations

Schedules

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<< Back to Vaccines Home

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Patient Reminder/Recall

- Reminder—notification that immunizations are due soon
- Recall—notification that immunizations are past due
- Content of message and technique of delivery vary
- Reminders and recall have been found to be effective



Provider Prompts

- Communication to health care providers that a patient's immunizations are due soon or past due
- Examples include:
 - Computer-generated list
 - Stamped note in the chart
 - “Immunization Due” clip on chart
 - Electronic reminder in an electronic medical record

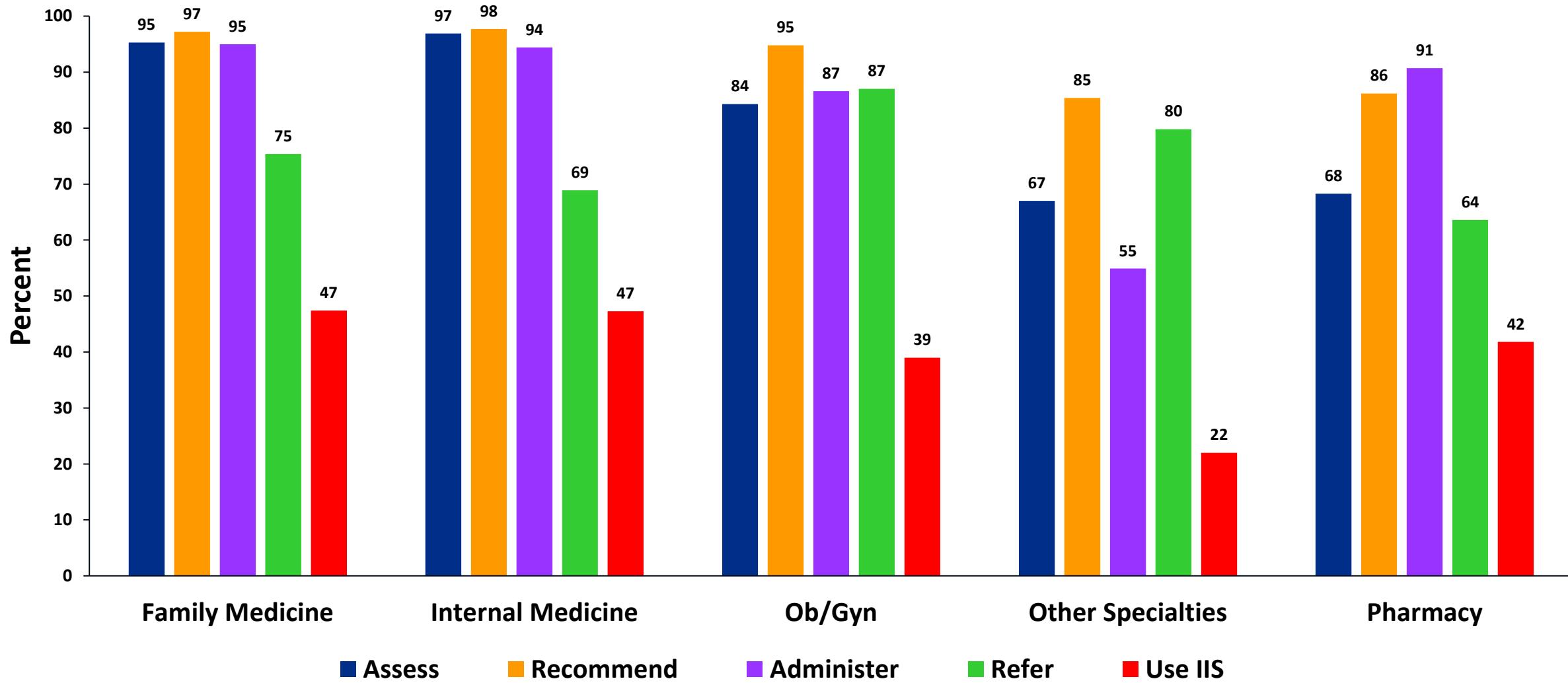


Immunization Information Systems (IISs)

- Documenting vaccinations in the IIS can benefit your practice by:
 - Consolidating vaccination records for your patients
 - Helping you assess your patients' immunization status
 - Reducing chances for unnecessary doses of vaccine or missed opportunities to provide vaccines
 - Facilitating use of reminder and recall notifications to send to patients
 - Making calculation of your office's immunization coverage rates easier



Reported Implementation of Standards Components Among HCPs, by Provider Specialty, United States, 2016 (N=1,918)



Reduce of Other Barriers to Immunization

- Physical barriers clinic hours

- waiting time
 - distance



- Psychological barriers

- unpleasant experience
 - vaccine safety concerns



What Can Be Done to Improve 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



Health Care Personnel Resources

CDC Vaccine and Immunization Resources

Questions? Email CDC

nipinfo@cdc.gov or www.cdc.gov/cdcinfo

Immunization website

www.cdc.gov/vaccines

Twitter

[@DrNancyM_CDC](https://twitter.com/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-influenza-hcp.html



Morbidity and Mortality Weekly Report (MMWR)

www.cdc.gov/mobile/applications/mobileframework/mmwrpromo.html



Travel well

wwwnc.cdc.gov/travel/page/apps-about

Summary

- Infections that can be prevented through vaccination impact persons of all ages
 - Adults, especially older adults, often disproportionately impacted
- Vaccines are available but are underutilized, especially for adults, including:
 - Vaccination of pregnant women to prevent influenza and pertussis in infants younger than 6 months
 - Adults 19 and older with high-risk conditions e.g., diabetes
- Ensuring that adults are up to date on recommended vaccines, including vaccines they may not have received as a child or adolescent, is key to helping adults stay healthy and preventing hospitalizations, disability, and premature deaths

Questions?

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For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov



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