THE NATIONAL VACCINE PROGRAM OFFICE

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

Missouri's First Adult Immunization & Billing Summit
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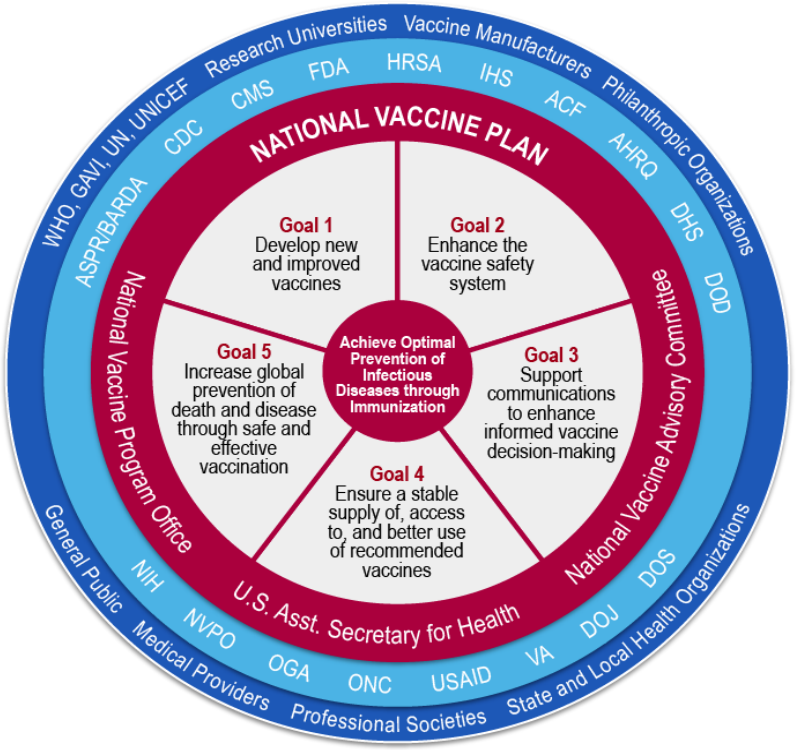
Disclosure

- 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

NATIONAL VACCINE PROGRAM OFFICE (NVPO)

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

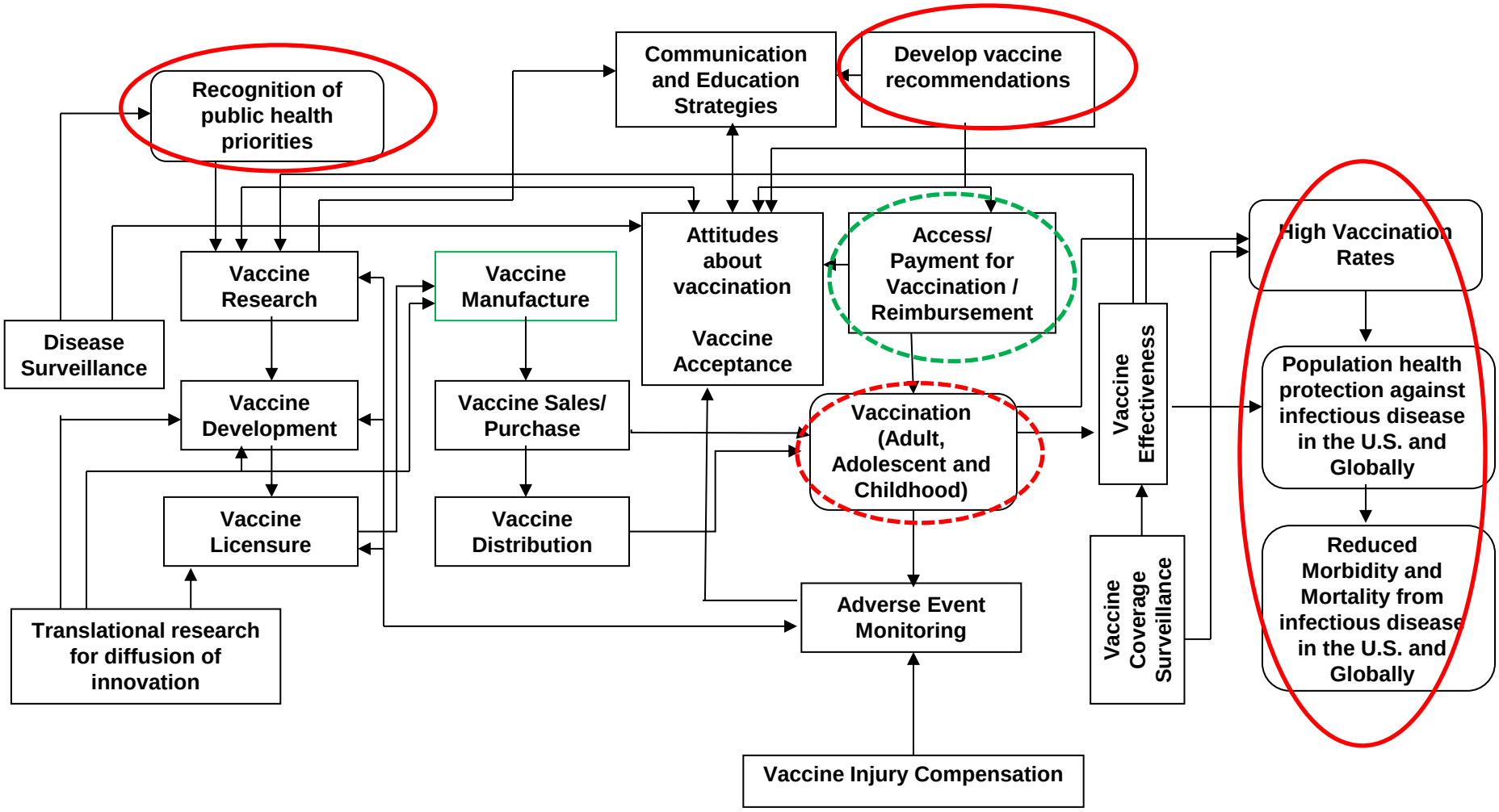
Development
"Translation"

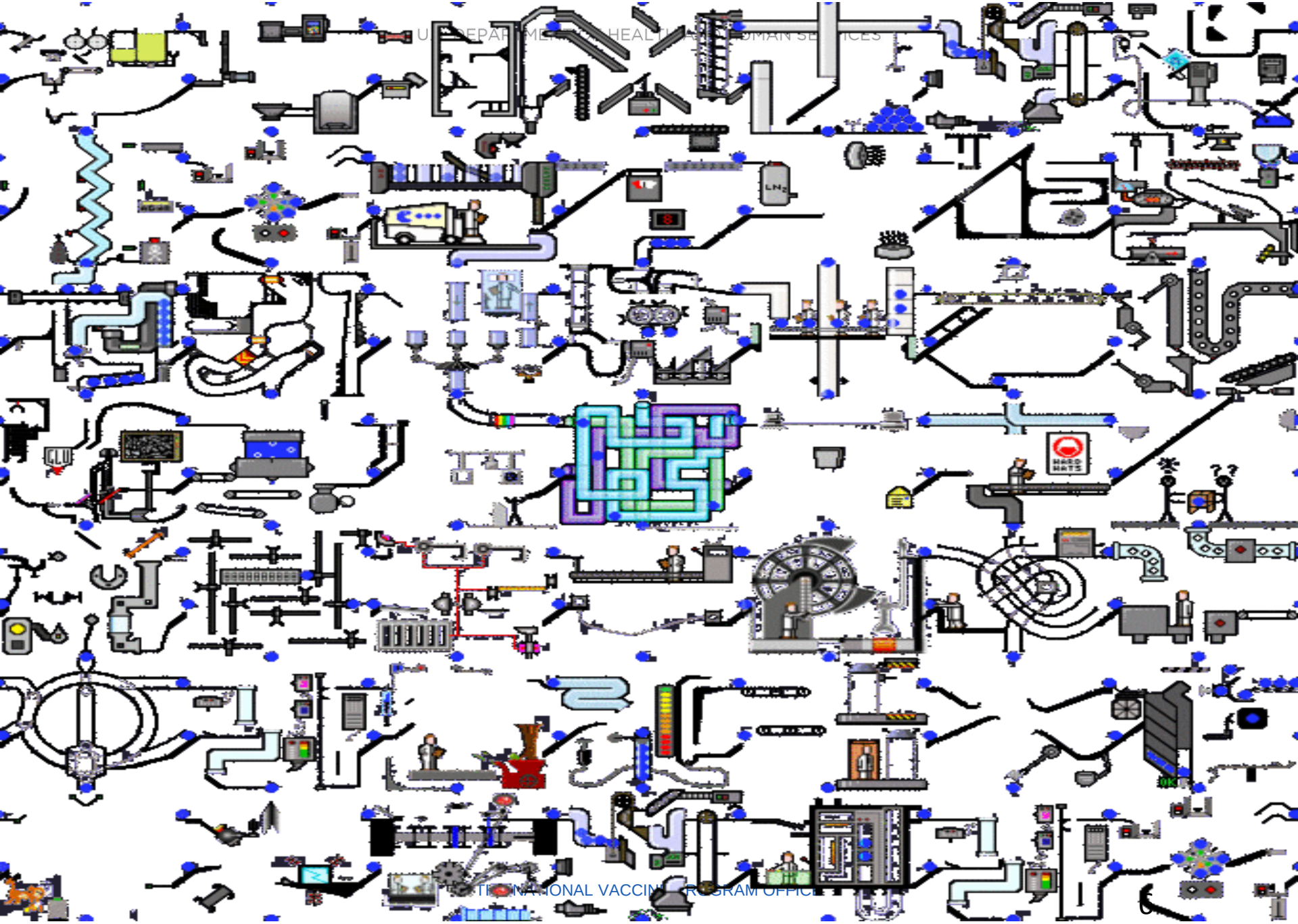
Licensing

Recommendations
& Use

Measuring
Impact

From Vaccine to Vaccination: A Systems View

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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

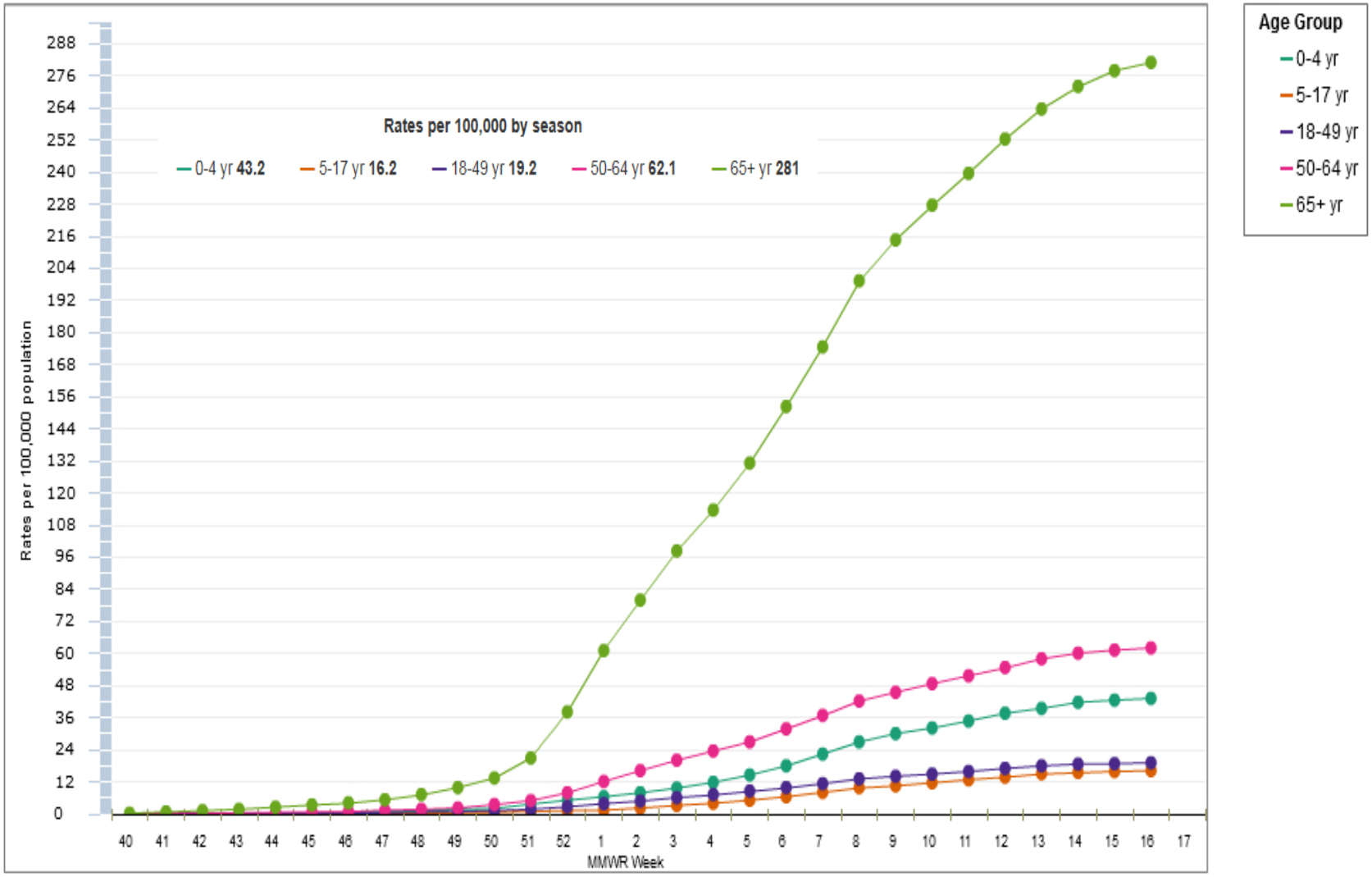
Vaccine-preventable diseases disproportionately affect adults, particularly older adults

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:
1. Thompson WW, et al. Influenza-Associated Hospitalizations in the United States. JAMA 2004;292:1333–1340
2. CDC. Estimates of deaths associated with seasonal influenza – United States, 1976–2007. MMWR 2010;59(33):1057–1062
3. Molinari, et al. The annual impact of seasonal influenza in the US: Measuring disease burden and costs. Vaccine 2007;25:5086–5096

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



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]

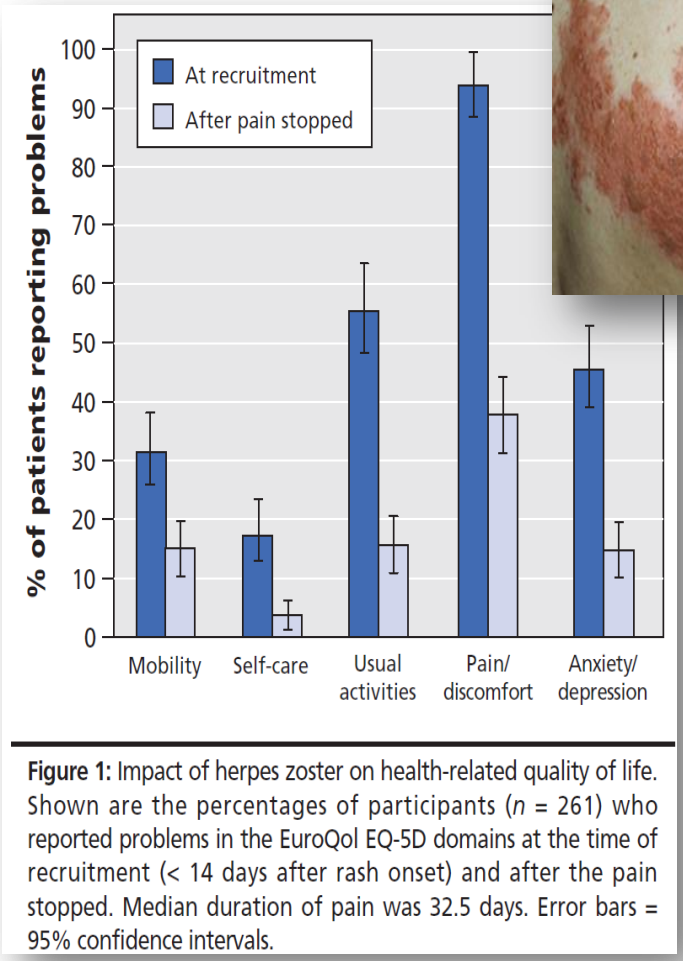
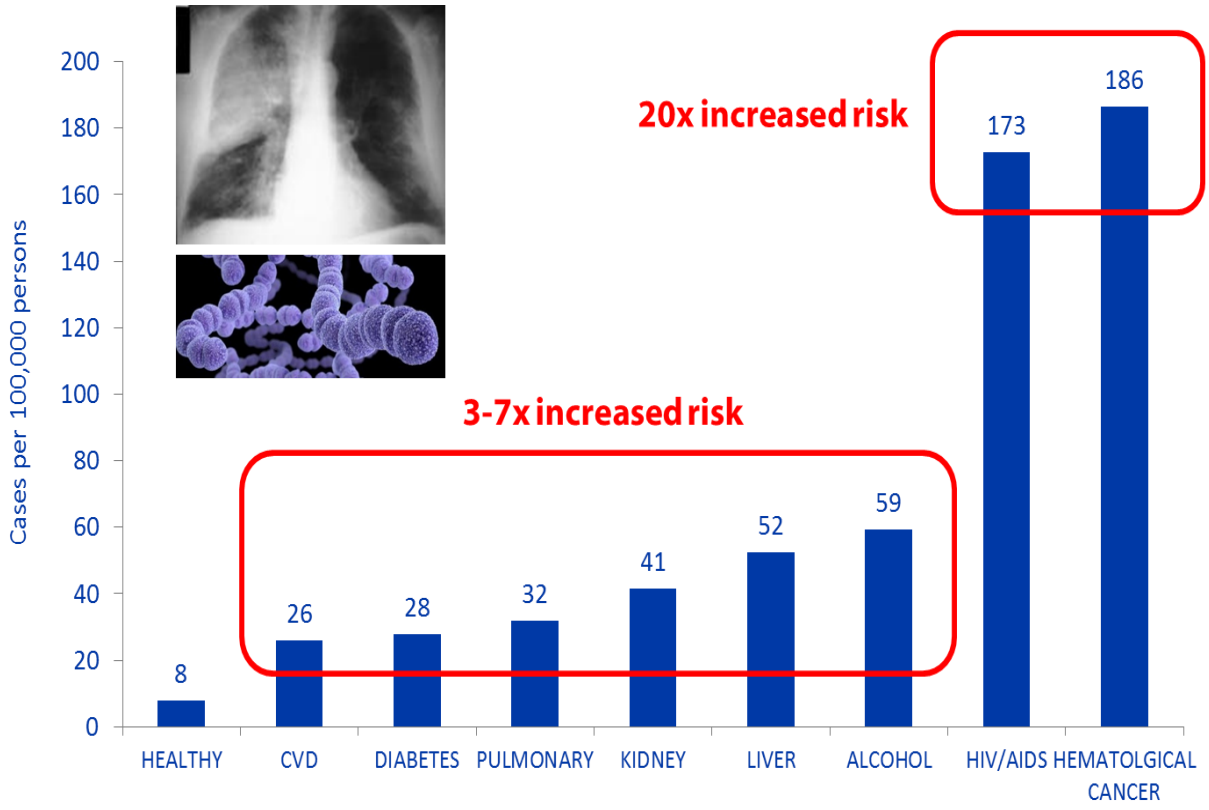


Figure 1: Impact of herpes zoster on health-related quality of life. Shown are the percentages of participants (*n* = 261) who reported problems in the EuroQol EQ-5D domains at the time of recruitment (< 14 days after rash onset) and after the pain stopped. Median duration of pain was 32.5 days. Error 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[1]
- 89% cases, almost all deaths occur among adults[1]



Source:

1. CDC. Active Bacterial Core Surveillance. Available at: http://www.cdc.gov/abcs/reports-findings/survreports/spneu13.pdf0000
2. Kyaw. JID 2005;192:377–86

Burden of Pertussis

- 21,000 cases in 2015
  - 22% among adults
- Most severe for infants
- Among hospitalized:
  - Apnea (61%)
  - Pneumonia (23%)
  - Death (1%)

Source:
CDC. National Notifiable Disease Surveillance System. https://www.cdc.gov/pertussis/surv-reporting.html

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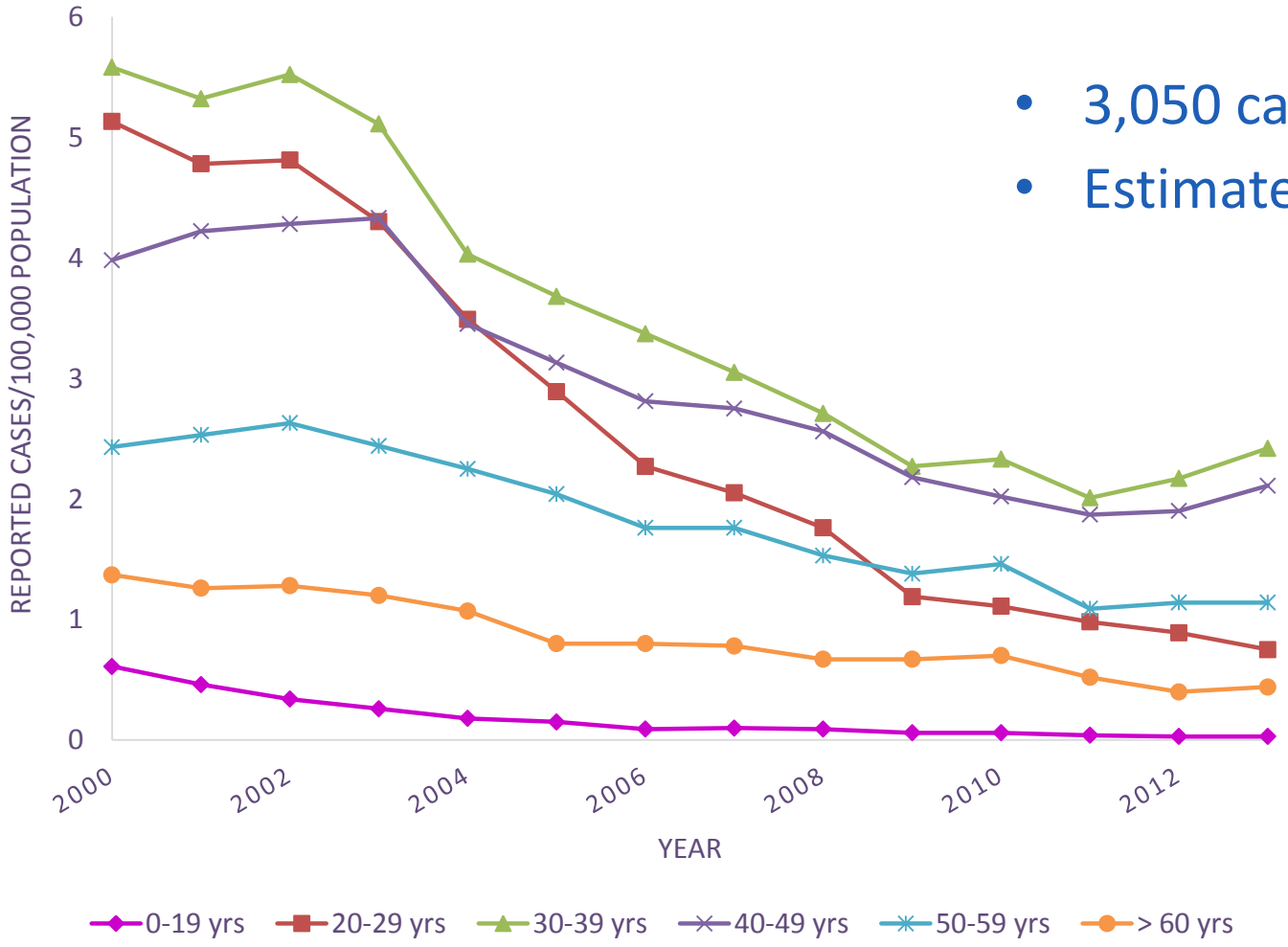
Incidence of Acute Hepatitis B, By Age Group, United States, 2000–2013



- 3,050 cases in 2015[1]
- Estimated 19,800 cases[1]

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)

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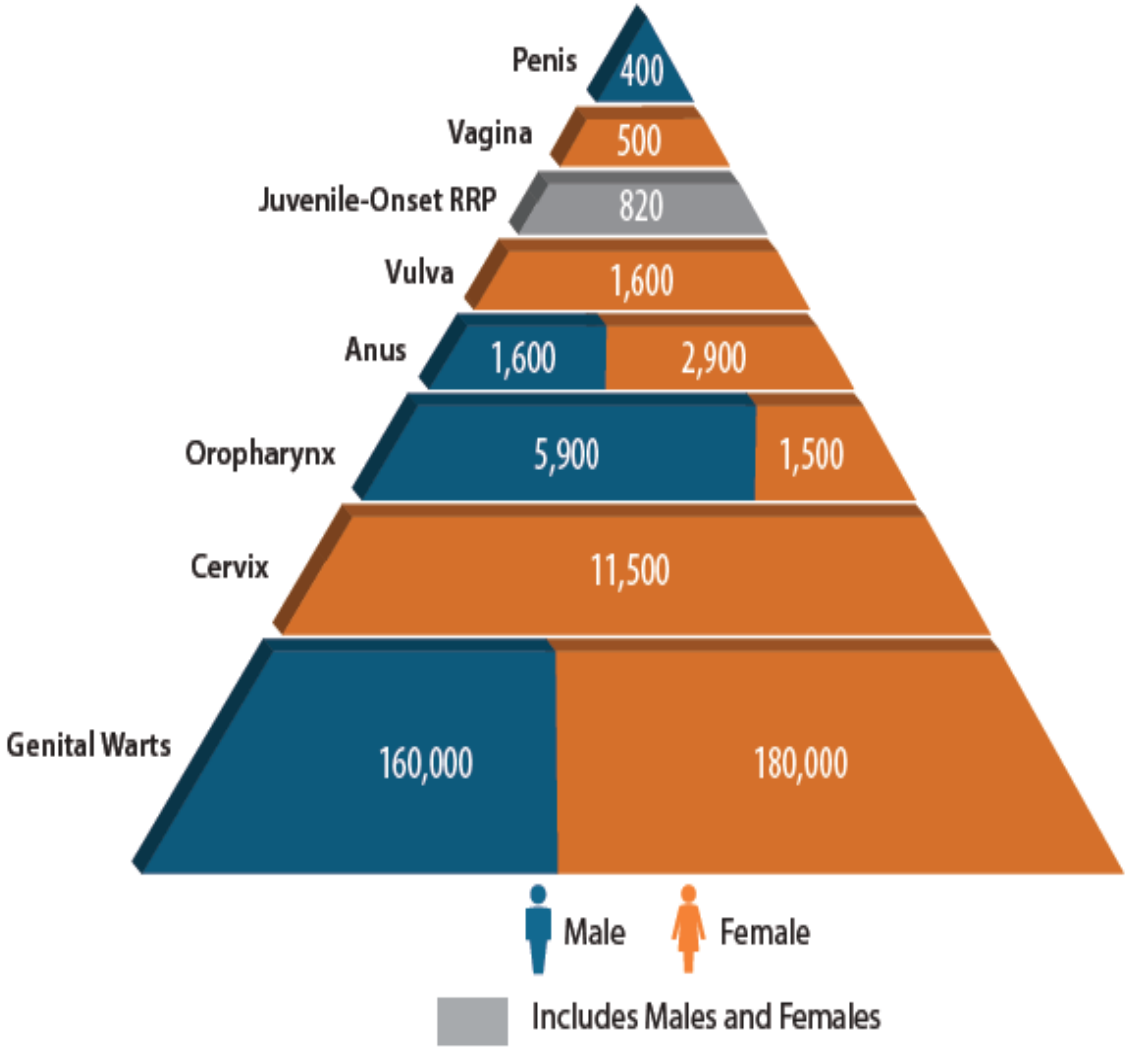
Numbers of U.S. Cancers and Genital Warts Attributed to HPV Infections



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[1]

- 2016-2017 interim vaccine effectiveness estimate[2]
  - 43% against A(H3N2), similar to years past
  - 61% against A(H1N1)pdm09

Source:

1. CDC. Prevention and Control of Seasonal Influenza: Recommendations of the ACIP – U.S., 2016–17. MMWR 2016
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:

1. Barnes M, et al. Acute myocardial infarction and influenza: a meta-analysis of case–control studies. Heart 2015;101:1738–1747
2. Udell JA, et al. Association between influenza vaccination and cardiovascular outcomes in high-risk patients: a meta-analysis. JAMA 2013;310:1711–20

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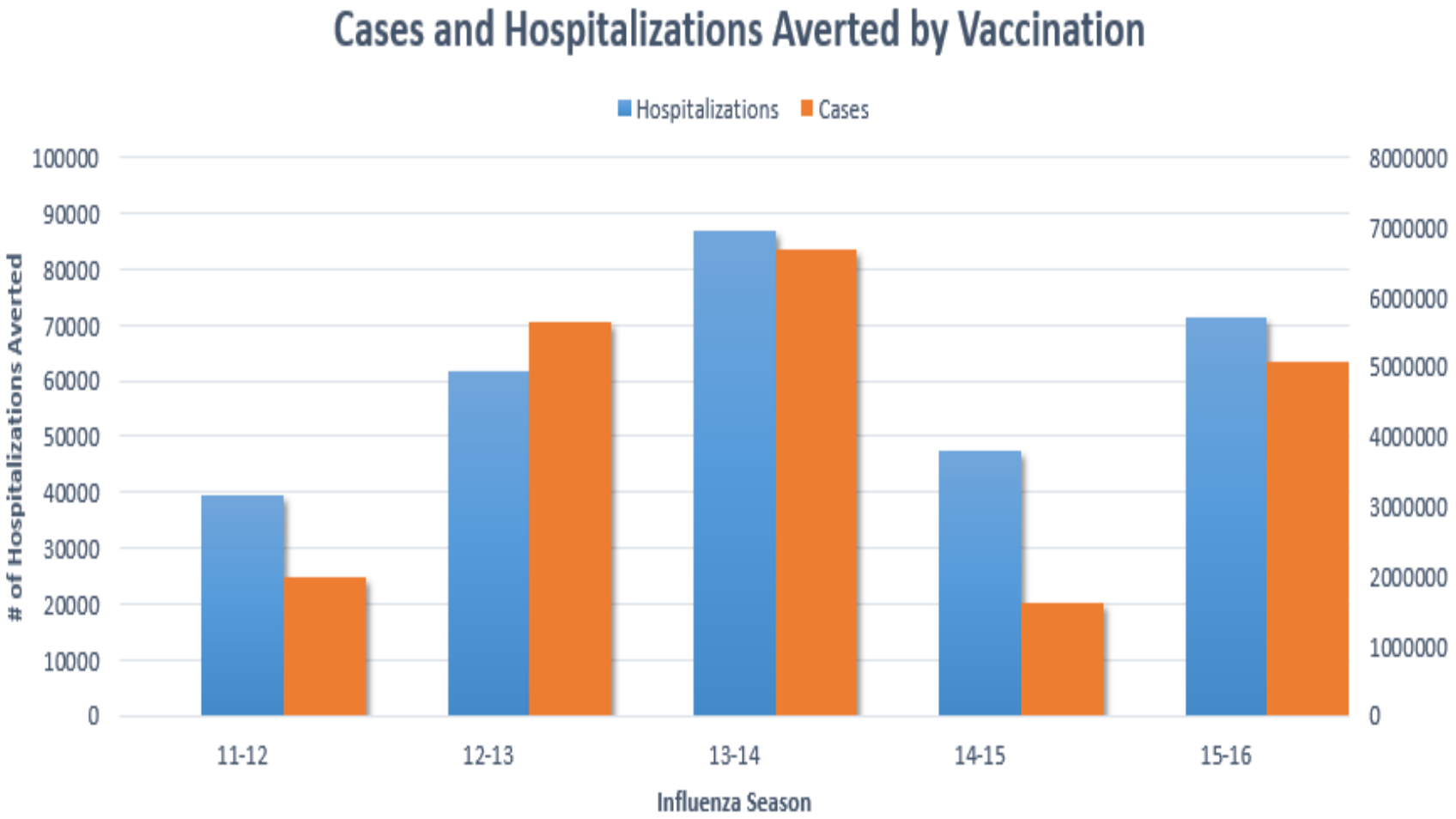
Impact of Influenza Vaccination
Illnesses and Hospitalizations Prevented, 2011–2016



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[1]
- Inactivated adjuvanted 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[2]
  - Subsequent 90% (95%CI 84,94) effectiveness among ≥70y[3]
  - Immunogenicity persisted through 9y post-vaccination[4]

Source:

1. Oxman MN, et al. NEJM 2005;352:2271–2284
2. Lal H, et al. NEJM 2015
3. Cunningham AL, et al NEJM 2016
4. Presented at February 2017 ACIP meeting

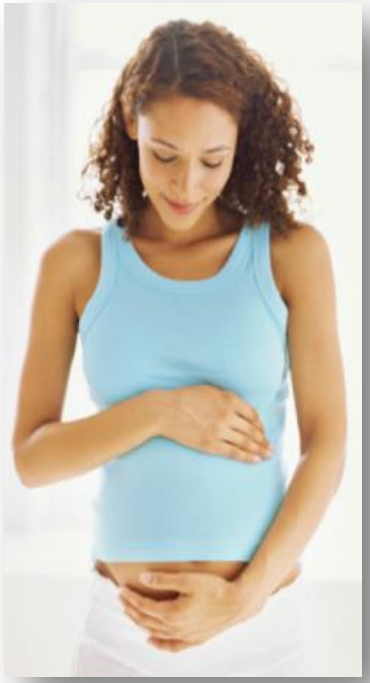
Impact of Vaccination – Pneumococcal

- 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:
Bonten MJ, et al. NEJM 2015;372:1114–25

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		
Pertussis	Prevented with Tdap after pregnancy	Prevented with Tdap during pregnancy
Cases (2746)	549	906
Hospitalizations (1217)	219	462
Deaths (18)	3	9

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.

Source:

Kroger AT, Duchin J, Vázquez M. General Best Practice Guidelines for Immunization. Best Practices Guidance of the Advisory Committee on Immunization Practices (ACIP) https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/downloads/general-recs.pdf

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")

- LAIV not recommended for 2016–2017 due to concerns re: low effectiveness against H1N1pdm09 in U.S. in 2013–2014 and 2015–2016

- 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):1-25Revised 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 ≥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 ≥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

Medical indication	Underlying medical condition	PCV13 for ≥ 19 years	PPSV23* for 19 through 64 years		PCV13 at ≥ 65 years	PPSV23 at ≥ 65 years
		Recommended	Recommended	Revaccination	Recommended	Recommended
None	None of the below				✓	✓ ≥ 1 year after PCV13
Immunocompetent persons	Alcoholism		✓		✓	✓ ≥ 1 year after PCV13 ≥ 5 years after any PPSV23 at < 65 years
	Chronic heart disease†					
	Chronic liver disease					
	Chronic lung disease§					
	Cigarette smoking					
	Diabetes mellitus					
	Cochlear implants	✓	✓ ≥ 8 weeks after PCV13		✓ If no previous PCV13 vaccination	✓ ≥ 8 weeks after PCV13 ≥ 5 years after any PPSV23 at < 65 years
	CSF leaks					
Persons with functional or anatomic asplenia	Congenital or acquired asplenia	✓	✓ ≥ 8 weeks after PCV13	✓ ≥ 5 years after first dose PPSV23	✓ If no previous PCV13 vaccination	✓ ≥ 8 weeks after PCV13 ≥ 5 years after any PPSV23 at < 65 years
	Sickle cell disease/other hemoglobinopathies					
Immunocompromised persons	Chronic renal failure	✓	✓ ≥ 8 weeks after PCV13	✓ ≥ 5 years after first dose PPSV23	✓ If no previous PCV13 vaccination	✓ ≥ 8 weeks after PCV13 ≥ 5 years after any PPSV23 at < 65 years
	Congenital or acquired immunodeficiencies¶					
	Generalized malignancy					
	HIV infection					
	Hodgkin disease					
	Iatrogenic immunosuppression#					
	Leukemia					
	Lymphoma					
	Multiple myeloma					
	Nephrotic syndrome					
	Solid organ transplant					

*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 congestive heart failure and cardiomyopathies

§Including chronic obstructive pulmonary disease, emphysema, and asthma

¶Includes B- (humoral) or T-lymphocyte deficiency, complement deficiencies (particularly C1, C2, C3, and C4 deficiencies), and phagocytic disorders (excluding chronic granulomatous disease)

#Diseases requiring treatment with immunosuppressive drugs, including long-term systemic corticosteroids and radiation therapy

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

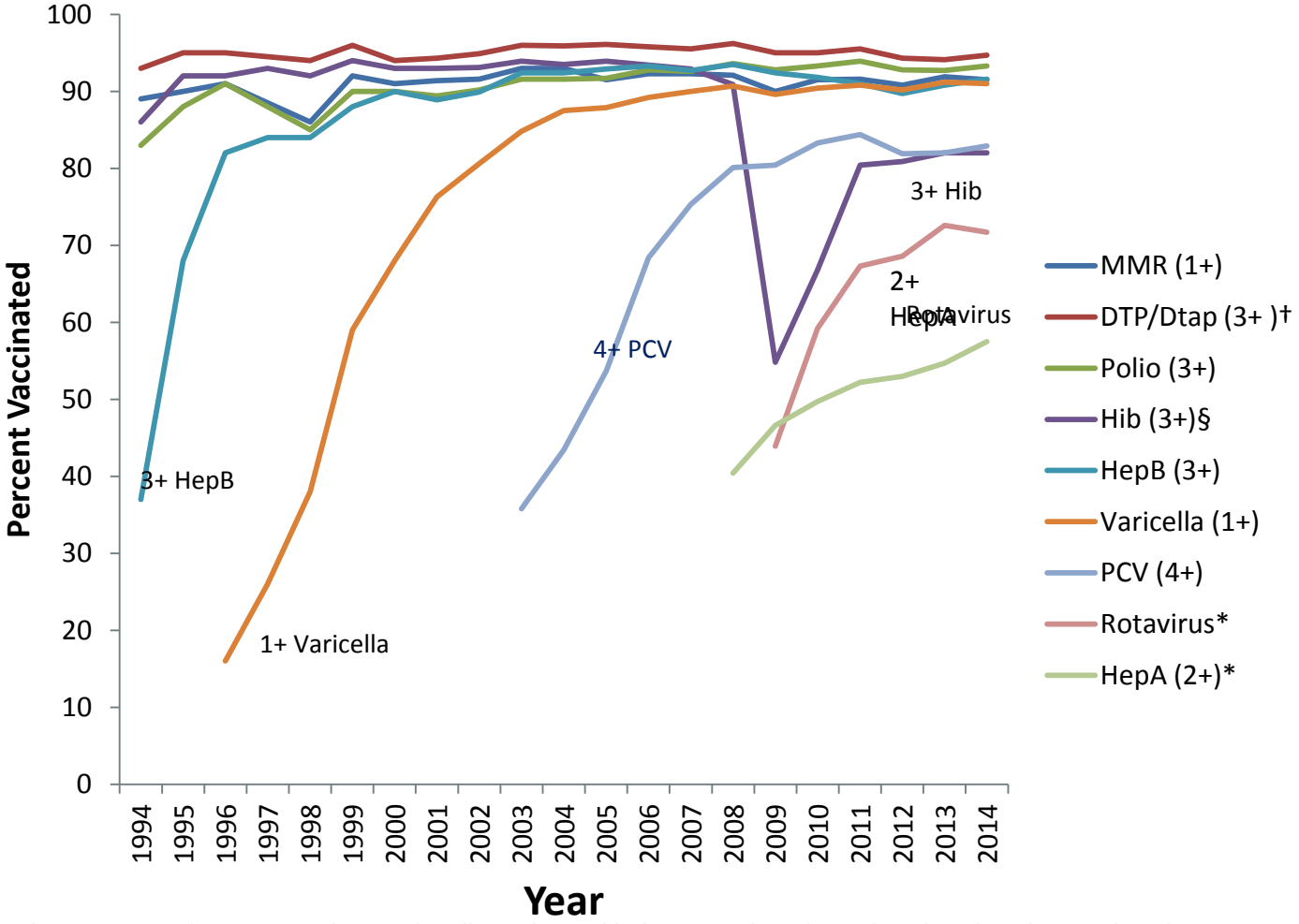
Adult Vaccination Coverage, United States, 2015

- **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

Vaccination Coverage* Among Children 19–35 Months, National Immunization Survey, United States, 1994–2014

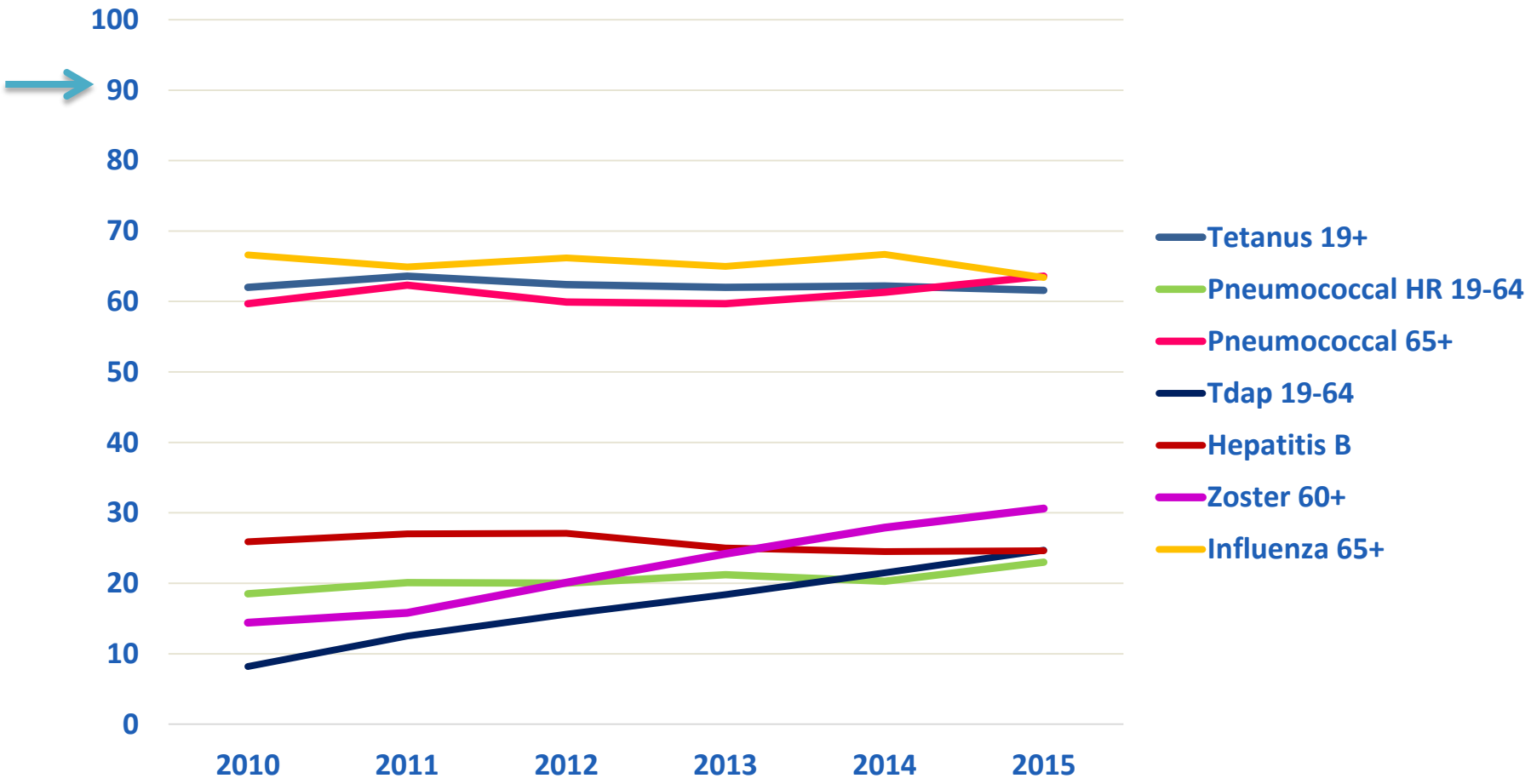


* The *Healthy People* 2020 target for coverage is 90% for all vaccines with the exception of rotavirus (80%) and HepA (85%).

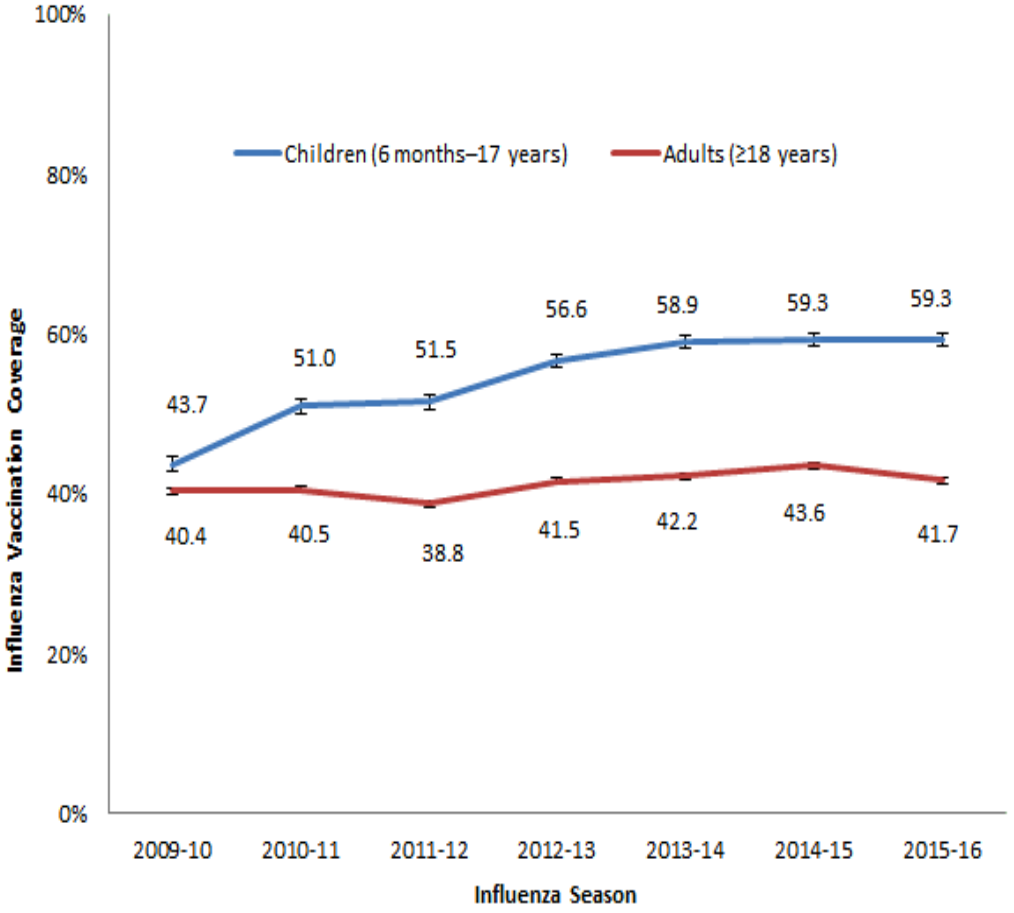
† DTP (3+) is not a Healthy People 2020 objective. DTaP (4+) is used to assess Healthy People 2020 objectives.

§ Reflects 3+ doses through 2008, and Full Series (3 or 4 doses depending on type of vaccine received) 2009 and later.

Adult Vaccination Coverage for Selected Vaccines and Age Groups, BRFSS 2010–2016 Influenza Seasons and NHIS 2010–2015



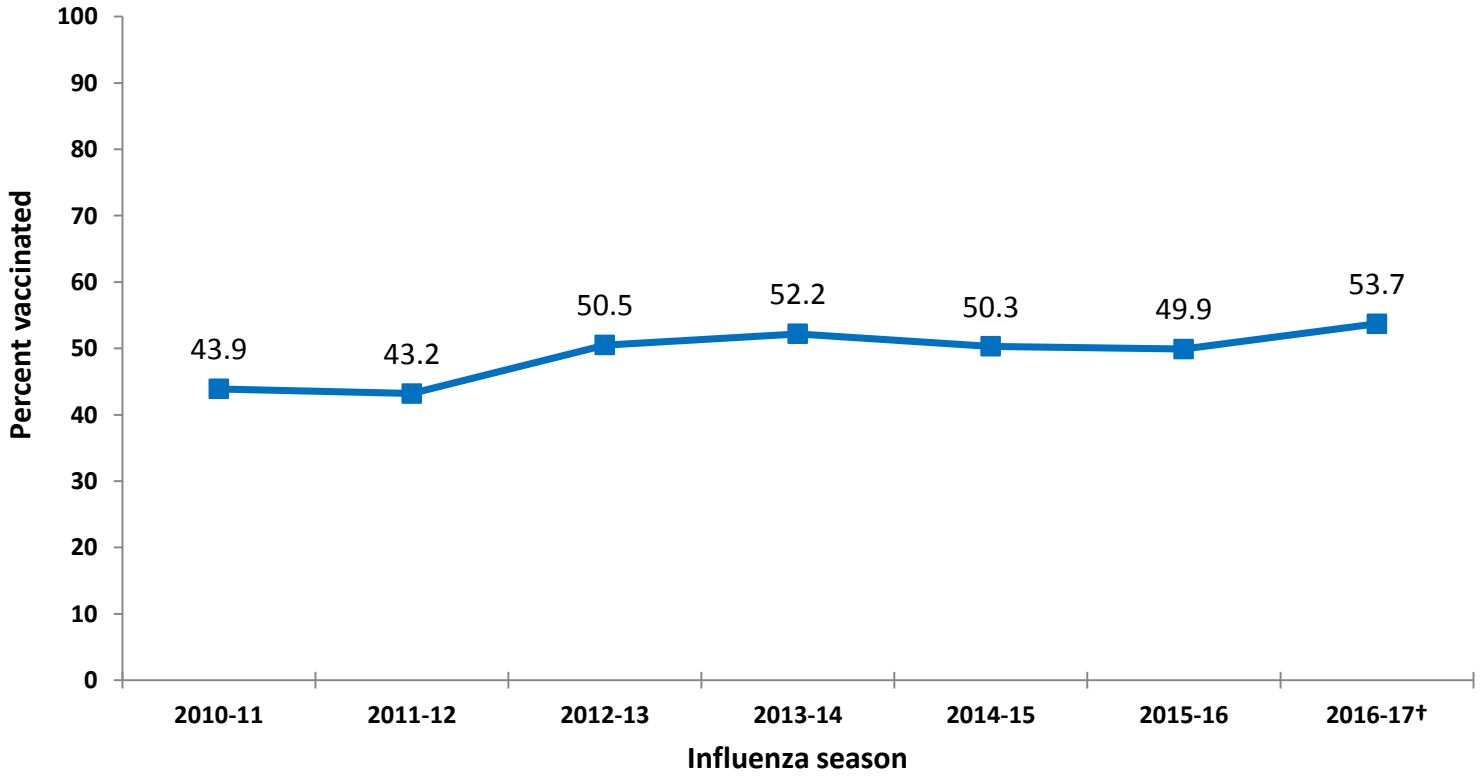
Seasonal Flu Vaccination Coverage by Age Group and Season, United States, 2009-2016



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 telephone samples 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

Which of the following best describes you…	Tdap (19+)	Pneumo (65+)	Zoster (60+)
I am not aware that I need this vaccine	52%	22%	18%
I am aware that i need this vaccine, but haven't thought about getting it	6%	3%	6%
I am considering getting this vaccine, but have not yet decided	5%	3%	9%
I have decided to get this vaccine, but have not yet gotten vaccinated	3%	4%	8%
I have decided not to get this vaccine	13%	13%	19%
I have gotten this vaccine	22%	56%	39%

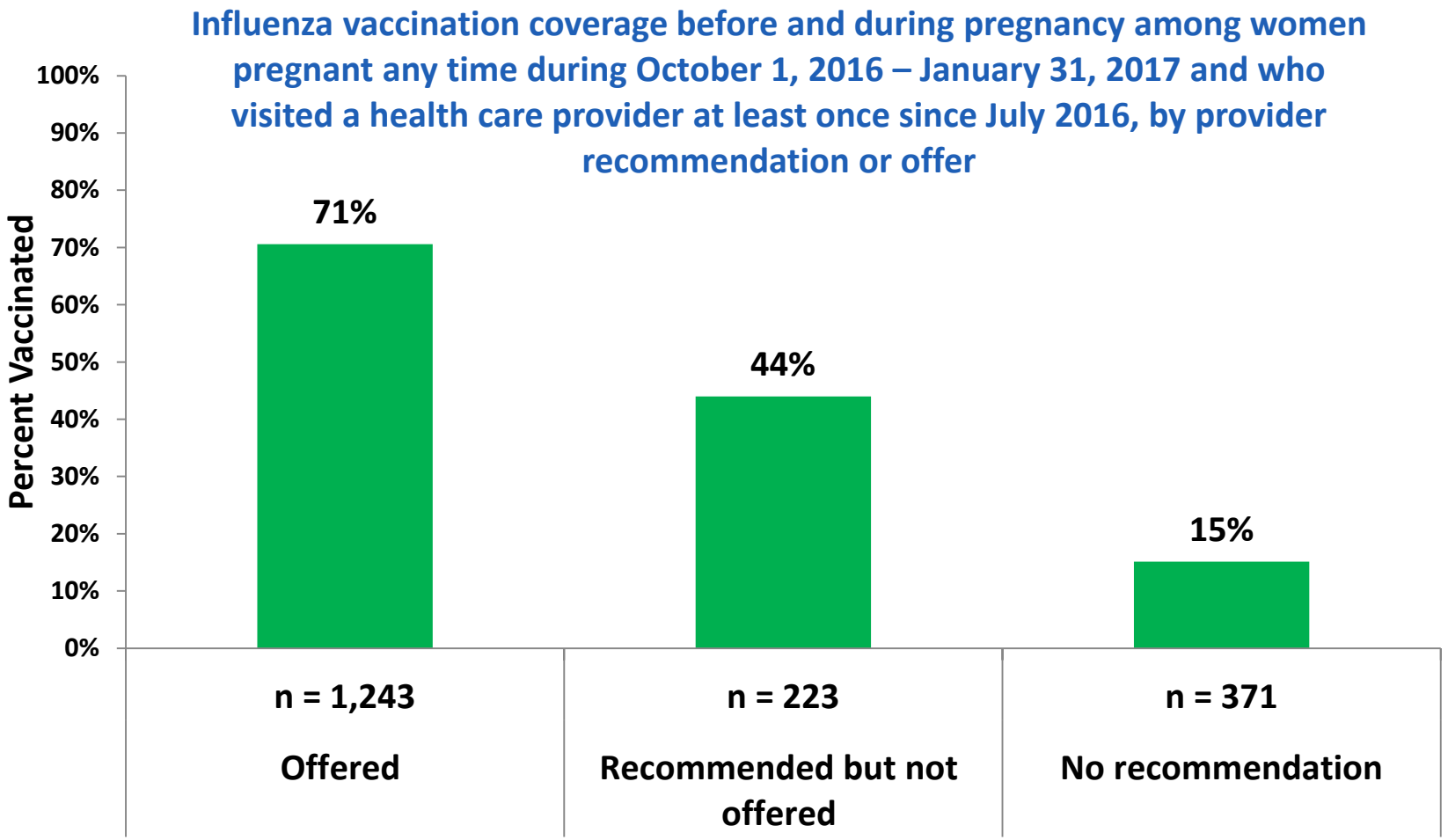
Source:
Porter Novelli 2015. Consumerstyles (Fall) Unpublished

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

Vaccination Uptake by Provider Recommendation and 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)

CDC announced the availability of the 2017 adult immunization schedule at www.cdc.gov/vaccines/schedules/hcp/index.html 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 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/rr6002a1.htm.
- Vaccine Information Statements that explain benefits and risks of vaccines are available at www.cdc.gov/vaccines/hcp/vis/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 wwwnc.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/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 acronyms are used for vaccines recommended for adults:

HepA	hepatitis A vaccine
HepA-HepB	hepatitis A and hepatitis B vaccines
HepB	hepatitis B vaccine
Hib	*Haemophilus influenzae* type b conjugate vaccine
HPV vaccine	human papillomavirus vaccine
HZV	herpes zoster vaccine
IIV	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
RIV	recombinant influenza vaccine
Td	tetanus and diphtheria toxoids
Tdap	tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine
VAR	varicella vaccine

[1] MMWR Morb Mortal Wkly Rep. 2017;66(5). Available at www.cdc.gov/mmwr/volumes/66/wr/mm6605e2.htm?s_cid=mm6605e2_w.
[2] Ann Intern Med. 2017;166:209-218. Available at annals.org/aim/article/doi/10.7326/M16-2936.

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

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

Vaccine	19–21 years	22–26 years	27–59 years	60–64 years	≥ 65 years
Influenza[1]	1 dose annually				
Td/Tdap[2]	Substitute Tdap for Td once, then Td booster every 10 yrs				
MMR[3]	1 or 2 doses depending on indication				
VAR[4]	2 doses				
HZV[5]				1 dose	
HPV–Female[6]	3 doses				
HPV–Male[6]	3 doses				
PCV13[7]	1 dose				
PPSV23[7]	1 or 2 doses depending on indication				1 dose
HepA[8]	2 or 3 doses depending on vaccine				
HepB[9]	3 doses				
MenACWY or MPSV4[10]	1 or more doses depending on indication				
MenB[10]	2 or 3 doses depending on vaccine				
Hib[11]	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 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

Vaccine	Pregnancy[1-6,9]	Immuno-compromised (excluding HIV infection)[3-7,11]	HIV infection CD4+ count (cells/µL)[3-7,9-11]		Asplenia, persistent complement deficiencies[7,10,11]	Kidney failure, end-stage renal disease, on hemodialysis[7,9]	Heart or lung disease, chronic alcoholism[7]	Chronic liver disease[7-9]	Diabetes[7,9]	Healthcare personnel[3,4,9]	Men who have sex with men[6,8,9]
			< 200	≥ 200							
Influenza[1]	1 dose annually										
Td/Tdap[2]	1 dose Tdap each pregnancy	Substitute Tdap for Td once, then Td booster every 10 yrs									
MMR[3]	contraindicated			1 or 2 doses depending on indication							
VAR[4]	contraindicated			2 doses							
HZV[5]	contraindicated				1 dose						
HPV–Female[6]		3 doses through age 26 yrs									
HPV–Male[6]		3 doses through age 26 yrs			3 doses through age 21 yrs						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 or MPSV4[10]	1 or more doses depending on indication										
MenB[10]	2 or 3 doses depending on vaccine										
Hib[11]	3 doses post-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 additional medical conditions or other indications

Contraindicated

No recommendation

Footnotes. Recommended immunization schedule for adults aged 19 years or older, United States, 2017

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).
- In addition to standard-dose IIV, available options for adults in specific age groups include: high-dose or adjuvanted IIV for adults aged 65 years or older, intradermal IIV for adults aged 18 through 64 years, and RIV for adults aged 18 years or older.
- Notes: Live attenuated influenza vaccine (LAIV) should not be used during the 2016–2017 influenza season. A list of currently available influenza vaccines is available at www.cdc.gov/flu/protect/vaccine/vaccines.htm.

Special populations

- Adults with a history of egg allergy who have only hives after exposure to egg should receive age-appropriate IIV or RIV.
- Adults with a history of egg allergy other than hives, e.g., angioedema, respiratory distress, lightheadedness, or recurrent emesis, or who required epinephrine or another emergency medical intervention, may receive age-appropriate IIV or RIV. The selected vaccine should 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.
- Pregnant women and women who might become pregnant in the upcoming influenza season should receive IIV.

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 toxoids (Td) booster every 10 years. Tdap should be administered regardless of when a tetanus or diphtheria toxoid-containing vaccine was last received.
- Adults with an unknown or incomplete history of a 3-dose primary series with tetanus and diphtheria toxoid-containing vaccines should complete the primary series that includes 1 dose of Tdap. Unvaccinated adults should receive the first 2 doses at least 4 weeks apart and the third dose 6–12 months after the second dose.
- Notes: Information on the use of Td or Tdap as tetanus prophylaxis in wound management is available at www.cdc.gov/mmwr/preview/mmwrhtml/rr5517a1.htm.

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.
- Notes: Acceptable evidence of immunity to measles, mumps, or rubella in adults is: born before 1957, documentation of receipt of MMR, or laboratory evidence of immunity or disease. Documentation of healthcare provider-diagnosed disease without laboratory confirmation is not acceptable evidence of immunity.

Special populations

- Pregnant women who do not have evidence of immunity to rubella should receive 1 dose of MMR upon completion or termination of pregnancy and before discharge from the healthcare facility; non-pregnant women of childbearing age without evidence of rubella immunity should receive 1 dose of MMR.
- Adults with primary or acquired immunodeficiency including malignant conditions affecting the bone marrow or lymphatic system, systemic immunosuppressive therapy, or cellular immunodeficiency should not receive MMR.
- Adults with human immunodeficiency virus (HIV) infection and CD4+ T-lymphocyte count ≥200 cells/µl for at least 6 months who do not have evidence of measles, mumps, or rubella immunity should receive 2 doses of MMR at least 28 days apart. Adults with HIV infection and CD4+ T-lymphocyte count <200 cells/µl should not receive MMR.
- Adults who work in healthcare facilities should receive 2 doses of MMR at least 28 days apart; healthcare personnel born before 1957 who are unvaccinated or lack laboratory evidence of measles, mumps, or rubella immunity, or laboratory confirmation of disease should be considered for vaccination with 2 doses of MMR at least 28 days apart for measles or mumps, or 1 dose of MMR for rubella.
- Adults who are students in postsecondary educational institutions or plan to travel internationally should receive 2 doses of MMR at least 28 days apart.
- Adults who received inactivated (killed) measles vaccine or measles vaccine of unknown type during years 1963–1967 should be revaccinated with 1 or 2 doses of MMR.
- Adults who were vaccinated before 1979 with either inactivated mumps vaccine or mumps vaccine of unknown type who are at high risk for mumps infection, e.g., work in a healthcare facility, should be considered for revaccination with 2 doses of MMR at least 28 days apart.

4. Varicella vaccination

General information

- Adults without evidence of immunity to varicella (defined below) should receive 2 doses of single-antigen varicella vaccine (VAR) 4–8 weeks apart, or a second dose if they have received only 1 dose.
- Persons without evidence of immunity for whom VAR should be emphasized are: adults who have close contact with persons at high risk for serious complications, e.g., healthcare personnel and household contacts of immunocompromised persons; adults who live or work in an environment in which transmission of varicella zoster virus is likely, e.g., teachers, childcare workers, and residents and staff in institutional settings; adults who live or work in environments in which varicella transmission has been reported, e.g., college students, residents and staff members of correctional institutions, and military personnel; non-pregnant women of childbearing age; adolescents and adults living in households with children; and international travelers.
- Notes: Evidence of immunity to varicella in adults is: U.S.-born before 1980 (for pregnant women and healthcare personnel, U.S.-born before 1980 is not considered evidence of immunity); documentation of 2 doses of VAR at least 4 weeks apart; history of varicella or herpes zoster diagnosis or verification of varicella or herpes zoster disease by a healthcare provider; or laboratory evidence of immunity or disease.

Special populations

- Pregnant women should be assessed for evidence of varicella immunity. Pregnant women who do not have evidence of immunity should receive the first dose of VAR upon completion or termination of pregnancy and before discharge from the healthcare facility, and the second dose 4–8 weeks after the first dose.
- Healthcare institutions should assess and ensure that all healthcare personnel have evidence of immunity to varicella.
- Adults with malignant conditions, including those that affect the bone marrow or lymphatic system or who receive systemic immunosuppressive therapy, should not receive VAR.
- Adults with human immunodeficiency virus (HIV) infection and CD4+ T-lymphocyte count ≥200 cells/µl may receive 2 doses of VAR 3 months apart. Adults with HIV infection and CD4+ T-lymphocyte count <200 cells/µl should not receive VAR.

5. Herpes zoster vaccination

General information

- 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.

Special populations

- Adults aged 60 years or older with chronic medical conditions may receive HZV unless they have a medical contraindication, e.g., pregnancy or severe immunodeficiency.
- Adults with malignant conditions, including those that affect the bone marrow or lymphatic system or who receive systemic immunosuppressive therapy, should not receive HZV.
- Adults with human immunodeficiency virus (HIV) infection and CD4+ T-lymphocyte count <200 cells/µl should not receive HZV.

6. Human papillomavirus vaccination

General information

- Adult females through age 26 years and adult males through age 21 years who have not received any human papillomavirus (HPV) vaccine should receive a 3-dose series of HPV vaccine at 0, 1-2, and 6 months. Males aged 22 through 26 years may be vaccinated with a 3-dose series of HPV vaccine at 0, 1–2, and 6 months.
- Adult females through age 26 years and adult males through age 21 years (and males aged 22 through 26 years who may receive HPV vaccination) who initiated the HPV vaccination series before age 15 years and received 2 doses at least 5 months apart are considered adequately vaccinated and do not need an additional dose of HPV vaccine.
- Adult females through age 26 years and adult males through age 21 years (and males aged 22 through 26 years who may receive HPV vaccination) who initiated the HPV vaccination series before age 15 years and received only 1 dose, or 2 doses less than 5 months apart, are not considered adequately vaccinated and should receive 1 additional dose of HPV vaccine.
- Notes: HPV vaccination is routinely recommended for children at age 11 or 12 years. For adults who had initiated but did not complete the HPV vaccination series, consider their age at first HPV vaccination (described above) and other factors (described below) to determine if they have been adequately vaccinated.

Special populations

- Men who have sex with men through age 26 years who have not received any HPV vaccine should receive a 3-dose series of HPV vaccine at 0, 1-2, and 6 months.
- Adult females and males through age 26 years with immunocompromising conditions (described below), including those with human immunodeficiency virus (HIV) infection, should receive a 3-dose series of HPV vaccine at 0, 1–2, and 6 months.
- Pregnant women are not recommended to receive HPV vaccine, although there is no evidence that the vaccine poses harm. If a woman is found to be pregnant after initiating the HPV vaccination series, delay the remaining doses until after the pregnancy. No other intervention is needed. Pregnancy testing is not needed before administering HPV vaccine.
- Notes: Immunocompromising conditions for which a 3-dose series of HPV vaccine is indicated are primary or secondary immunocompromising conditions that might reduce cell-mediated or humoral immunity, e.g., B-lymphocyte antibody deficiencies, complete or partial T-lymphocyte defects, HIV infection, malignant neoplasm, transplantation, autoimmune disease, and immunosuppressive therapy.

7. Pneumococcal vaccination

General information

- Adults who are immunocompetent and aged 65 years or older should receive 13-valent pneumococcal conjugate vaccine (PCV13) followed by 23-valent pneumococcal polysaccharide vaccine (PPSV23) at least 1 year after PCV13.
- Notes: Adults are recommended to receive 1 dose of PCV13 and 1, 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. If 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 high risk for pneumococcal disease (described below) is available at www.cdc.gov/vaccines/vpd-vac/pneumo/downloads/adult-vax-clinician-aid.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 cardiomyopathies (excluding hypertension); chronic lung disease including chronic obstructive lung disease, emphysema, and asthma; chronic liver disease including cirrhosis; alcoholism; or diabetes mellitus; or who smoke cigarettes should receive PPSV23. At age 65 years or older, they 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 anatomical or functional asplenia (described below) should receive PCV13 and a 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, at age 65 years or older, administer another dose of PPSV23 at least 8 weeks after PCV13 and at least 5 years after the most recent dose of PPSV23.
- Adults aged 19 years or older with cerebrospinal fluid leak or cochlear implant should receive PCV13 followed by PPSV23 at least 8 weeks after PCV13. If the most recent dose of PPSV23 was administered before age 65 years, at age 65 years or older, administer another dose of PPSV23 at least 8 weeks after PCV13 and at least 5 years after the most recent dose of PPSV23.
- 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 excluding 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 iatrogenic 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 HIV 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 (HepA) at either 0 and 6–12 months (Havrix) or 0 and 6–18 months (Vaqta). Adults may also receive a combined hepatitis A and hepatitis B vaccine (HepA-HepB) (Twinrix) 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-HepB) (Twinrix) 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 HepB series, including sex partners of hepatitis B surface antigen (HBsAg)-positive persons, sexually active persons who are not in a mutually monogamous relationship, persons seeking evaluation or treatment for a 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 HepB series, including adults who are recent or current users of injection drugs, household contacts of HBsAg-positive persons, residents and staff of facilities for developmentally disabled persons, incarcerated, healthcare and public safety workers at risk for exposure to blood or blood-contaminated body fluids, younger than age 60 years with diabetes mellitus, and age 60 years or older with diabetes mellitus at the discretion of the treating clinician.
- 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.
- Adults with end-stage renal disease including those on pre-dialysis care, hemodialysis, peritoneal dialysis, and home dialysis should receive a HepB series. Adults on hemodialysis should receive a 3-dose series of 40 µg Recombivax HB at 0, 1, and 6 months or a 4-dose series of 40 µg Engerix-B at 0, 1, 2, and 6 months.
- Adults with human immunodeficiency virus (HIV) infection should receive a HepB 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 six months, been evaluated or treated for a sexually transmitted infection, recent or current injection drug use, or had an HBsAg-positive sex partner, should receive a HepB series.
- International travelers to regions with high or intermediate levels of endemic hepatitis B virus infection should receive a HepB series.
- Adults in the following settings are assumed to be at risk for hepatitis B virus infection and should receive a HepB 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 vaccination

Special populations

- Adults with anatomical 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-FHbp (Trumenba) 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 MenACWY 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 1 dose of MenACWY 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-FHbp at 0, 1–2, and 6 months.
- Adults at risk because of a meningococcal disease outbreak should receive 1 dose of MenACWY if the outbreak is attributable to serogroup A, C, W, or Y, or either a 2-dose series of MenB-4C at least 1 month apart or a 3-dose series of MenB-FHbp at 0, 1–2, and 6 months if the outbreak is attributable to serogroup B.
- Adults who travel to or live in countries with hyperendemic or epidemic 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 increased risk for infection remains.
- First-year college students aged 21 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 2-dose series of MenB-FHbp 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 serogroups A, C, W, and Y vaccine (MPSV4) is preferred. For adults who previously received MenACWY or anticipate receiving multiple doses of serogroups A, C, W, and Y meningococcal vaccine, MenACWY is preferred.
- Notes: MenB-4C and MenB-FHbp 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. MenB may be administered at the same time as MenACWY but at a different anatomic site, if feasible.

11. *Haemophilus influenzae* type b vaccination

Special populations

- Adults who have anatomical or functional asplenia or sickle cell disease, or are undergoing elective splenectomy should receive 1 dose of *Haemophilus influenzae* type b conjugate vaccine (Hib) 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 3 doses of Hib in at least 4 week 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

Vaccine	Contraindications	Precautions
All vaccines routinely recommended for adults	• Severe reaction, e.g., anaphylaxis, after a previous dose or to a vaccine component	• Moderate or severe acute illness with or without fever

Additional contraindications and precautions for vaccines routinely recommended for adults

Vaccine	Additional Contraindications	Additional Precautions
IIV[1]		• 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 (IIV 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)
RIV[1]		• History of Guillain-Barré Syndrome within 6 weeks after previous influenza vaccination
LAIV[1]	• LAIV should not be used during 2016–2017 influenza season	• LAIV should not be used during 2016–2017 influenza season
Tdap/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	• 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]	• Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy[3], human immunodeficiency virus (HIV) infection with severe immunocompromise • Pregnancy	• 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 testing[5]
VAR[2]	• Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy[3], HIV infection with severe immunocompromise • Pregnancy	• 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)
HZV[2]	• Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy[3], HIV infection with severe immunocompromise • Pregnancy	• 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		• Pregnancy
PCV13	• 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 HZV 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 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(No. RR-2). 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, 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):40–41 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.

Acronyms of vaccines recommended for adults

HepA	hepatitis A vaccine	LAIV	live attenuated influenza vaccine	PCV13	13-valent pneumococcal conjugate vaccine
HepA-HepB	hepatitis A and hepatitis B vaccines	MenACWY	serogroups A, C, W, and Y meningococcal conjugate vaccine	PPSV23	23-valent pneumococcal polysaccharide vaccine
HepB	hepatitis B vaccine			RIV	recombinant influenza vaccine
Hib	*Haemophilus influenzae* type b conjugate vaccine	MenB	serogroup B meningococcal vaccine	Td	tetanus and diphtheria toxoids
HPV vaccine	human papillomavirus vaccine	MMR	measles, mumps, and rubella vaccine	Tdap	tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine
HZV	herpes zoster vaccine	MPSV4	serogroups A, C, W, and Y meningococcal polysaccharide vaccine		
IIV	inactivated influenza vaccine			VAR	varicella vaccine

THE NATIONAL VACCINE PROGRAM OFFICE

Standards for Adult Immunization Practices: Strategies and Resources for Implementation

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

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

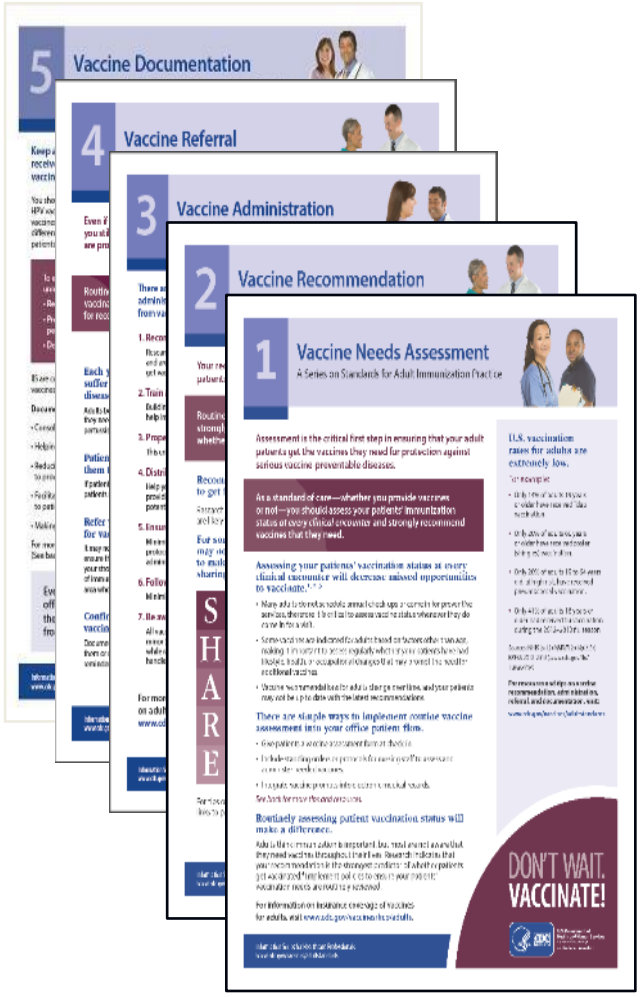
Intervention	Odds Ratio*
Organizational change (e.g., standing orders, separate clinics devoted to prevention)	16.0
Provider reminder	3.8
Patient financial incentive	3.4
Provider education	3.2
Patient reminder	2.5
Patient education	1.3

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

Source:

Stone E. Interventions that increase use of adult immunization and cancer screening services. Ann Intern Med. 2002; 136:641-51.

HCP Series: Implementing Standards



www.cdc.gov/vaccines/AdultStandards

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Assessment

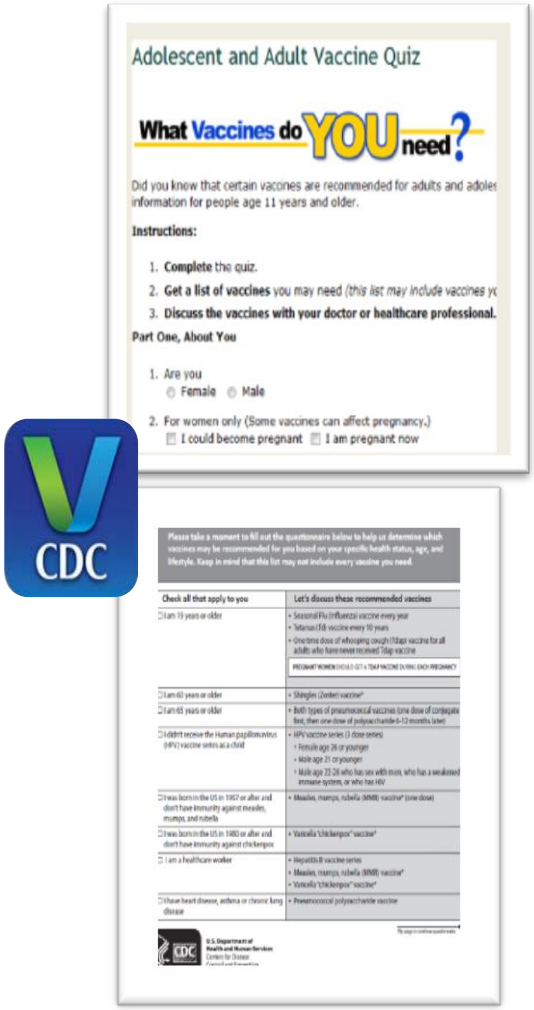
THE NATIONAL VACCINE PROGRAM OFFICE

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

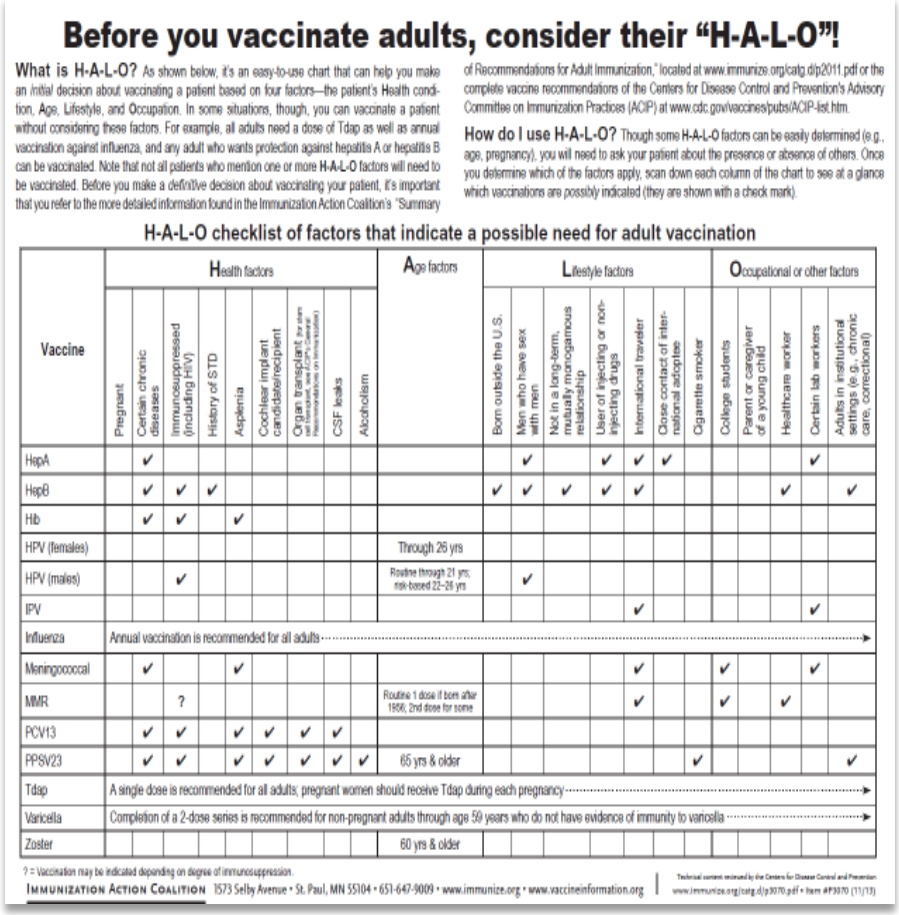
- Patient **check-in vaccine questionnaire** www.cdc.gov/vaccines/hcp/patient-ed/adults/downloads/patient-intake-form.pdf
- CDC patient **on-line quiz** generates tailored list of recommended vaccines to discuss with provider www.cdc.gov/vaccines/adultquiz
- CDC adult **vaccine schedule app** www.cdc.gov/vaccines/schedules/hcp/schedule-app.html



Examples Of Assessment Tools

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

Consider:
Health,
Age,
Lifestyle and
Occupation/Other Factors
H-A-L-O



Before you vaccinate adults, consider their "H-A-L-O"!

What is H-A-L-O? As shown below, it's an easy-to-use chart that can help you make an *initial* decision about vaccinating a patient based on four factors—the patient's Health condition, Age, Lifestyle, and Occupation. In some situations, though, you can vaccinate a patient without considering these factors. For example, all adults need a dose of Tdap as well as annual vaccination against influenza, and any adult who wants protection against hepatitis A or hepatitis B can be vaccinated. Note that not all patients who mention one or more H-A-L-O factors will need to be vaccinated. Before you make a definitive decision about vaccinating your patient, it's important that you refer to the more detailed information found in the Immunization Action Coalition's "Summary of Recommendations for Adult Immunization," located at www.immunize.org/catg.d/p2011.pdf or the complete vaccine recommendations of the Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices (ACIP) at www.cdc.gov/vaccines/pubs/ACIP-list.htm.

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 at a glance which vaccinations are *possibly* indicated (they are shown with a check mark).

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

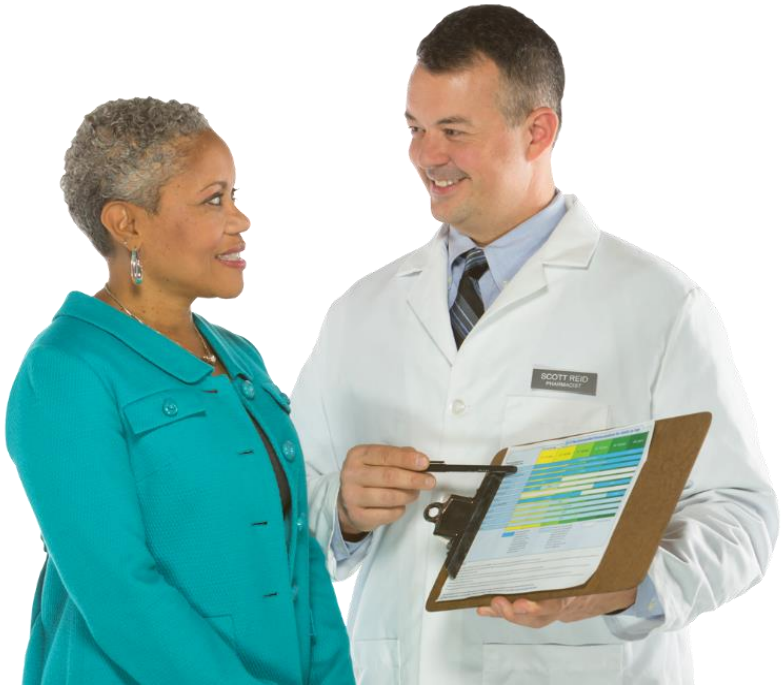
Vaccine	Health factors								Age factors	Lifestyle factors							Occupational or other factors				
	Pregnant	Certain chronic diseases	Immunosuppressed (including HIV)	History of STD	Asplenia	Cochlear implant candidate/recipient	Organ transplant (for stem cell transplant, see ACIP's General Recommendations on Immunization)	CSF leaks	Alcoholism		Born outside the U.S.	Men who have sex with men	Not in a long-term, mutually monogamous relationship	User of injecting or non-injecting drugs	International traveler	Close contact of international adoptee	Cigarette smoker	College students	Parent or caregiver of a young child	Healthcare worker	Certain lab workers	Adults in institutional settings (e.g., chronic care, correctional)
HepA		✔										✔		✔	✔	✔					✔	
HepB		✔	✔	✔							✔	✔	✔	✔	✔					✔		✔
Hib		✔	✔		✔																	
HPV (females)									Through 26 yrs													
HPV (males)			✔						Routine through 21 yrs; risk-based 22–26 yrs			✔										
IPV															✔						✔	
Influenza	Annual vaccination is recommended for all adults ····· ▶																					
Meningococcal		✔			✔										✔			✔			✔	
MMR			?						Routine 1 dose if born after 1956; 2nd dose for some						✔			✔		✔		
PCV13		✔	✔		✔	✔	✔	✔														
PPSV23		✔	✔		✔	✔	✔	✔	✔	65 yrs & older							✔					✔
Tdap	A single dose is recommended for all adults; pregnant women should receive Tdap during each pregnancy ····· ▶																					
Varicella	Completion of a 2-dose series is recommended for non-pregnant adults through age 59 years who do not have evidence of immunity to varicella ····· ▶																					
Zoster									60 yrs & older													

? = Vaccination may be indicated depending on degree of immunosuppression.

IMMUNIZATION ACTION COALITION 1573 Selby Avenue • St. Paul, MN 55104 • 651-647-9009 • www.immunize.org • www.vaccineinformation.org

Technical content reviewed by the Centers for Disease Control and Prevention
www.immunize.org/catg.d/p3070.pdf • Item #P3070 (11/13)

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

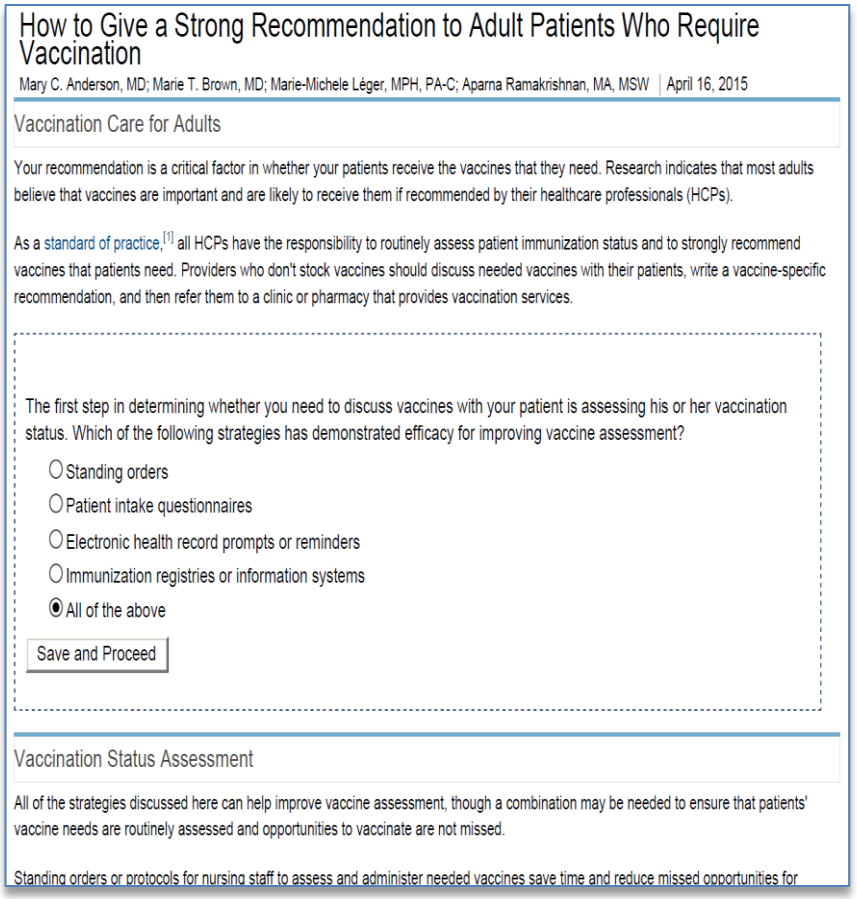
Strengthening Vaccine Recommendations

- **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.

Medscape MODULE

- Case Presentations/Videos
  - Use of SHARE in different patient scenarios

www.medscape.com/viewarticle/842874?src=par_cdc_stm_mscpedt&faf=1



How to Give a Strong Recommendation to Adult Patients Who Require Vaccination

Mary C. Anderson, MD; Marie T. Brown, MD; Marie-Michele Léger, MPH, PA-C; Aparna Ramakrishnan, MA, MSW | April 16, 2015

Vaccination Care for Adults

Your recommendation is a critical factor in whether your patients receive the vaccines that they need. Research indicates that most adults believe that vaccines are important and are likely to receive them if recommended by their healthcare professionals (HCPs).

As a standard of practice,[1] all HCPs have the responsibility to routinely assess patient immunization status and to strongly recommend vaccines that patients need. Providers who don't stock vaccines should discuss needed vaccines with their patients, write a vaccine-specific recommendation, and then refer them to a clinic or pharmacy that provides vaccination services.

The first step in determining whether you need to discuss vaccines with your patient is assessing his or her vaccination status. Which of the following strategies has demonstrated efficacy for improving vaccine assessment?

- ○ Standing orders
- ○ Patient intake questionnaires
- ○ Electronic health record prompts or reminders
- ○ Immunization registries or information systems
- ◉ All of the above

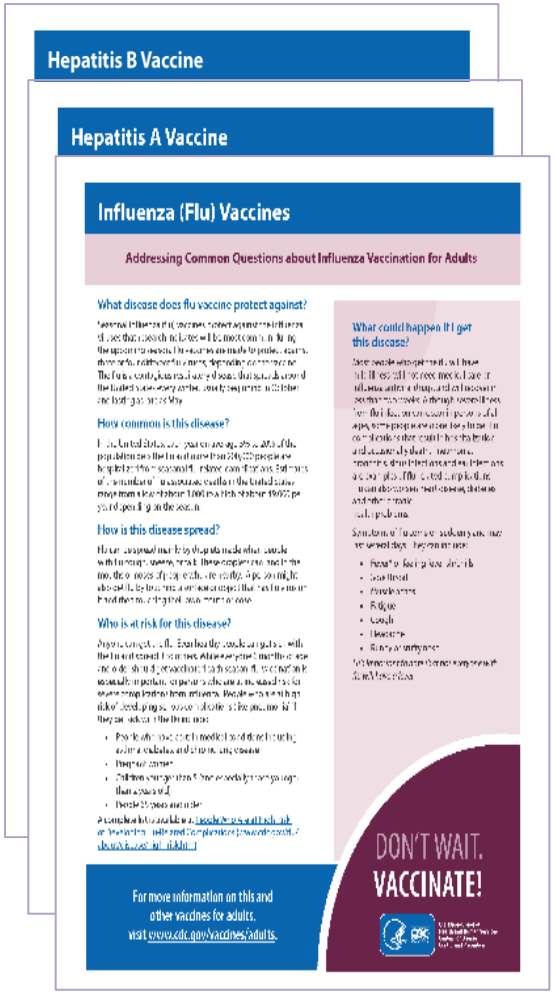
Save and Proceed

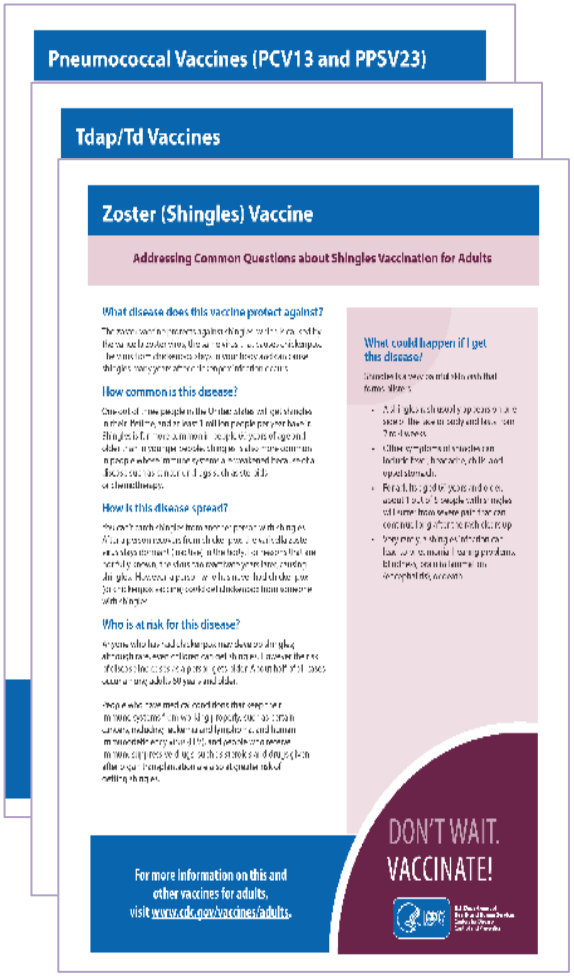
Vaccination Status Assessment

All of the strategies discussed here can help improve vaccine assessment, though a combination may be needed to ensure that patients' vaccine needs are routinely assessed and opportunities to vaccinate are not missed.

Standing orders or protocols for nursing staff to assess and administer needed vaccines save time and reduce missed opportunities for

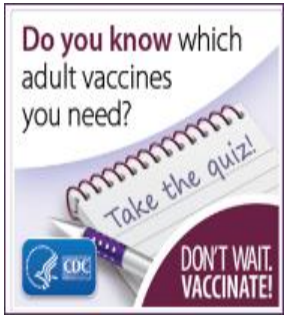
Addressing FAQs about Adult Vaccines

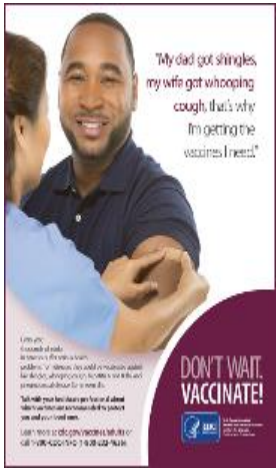




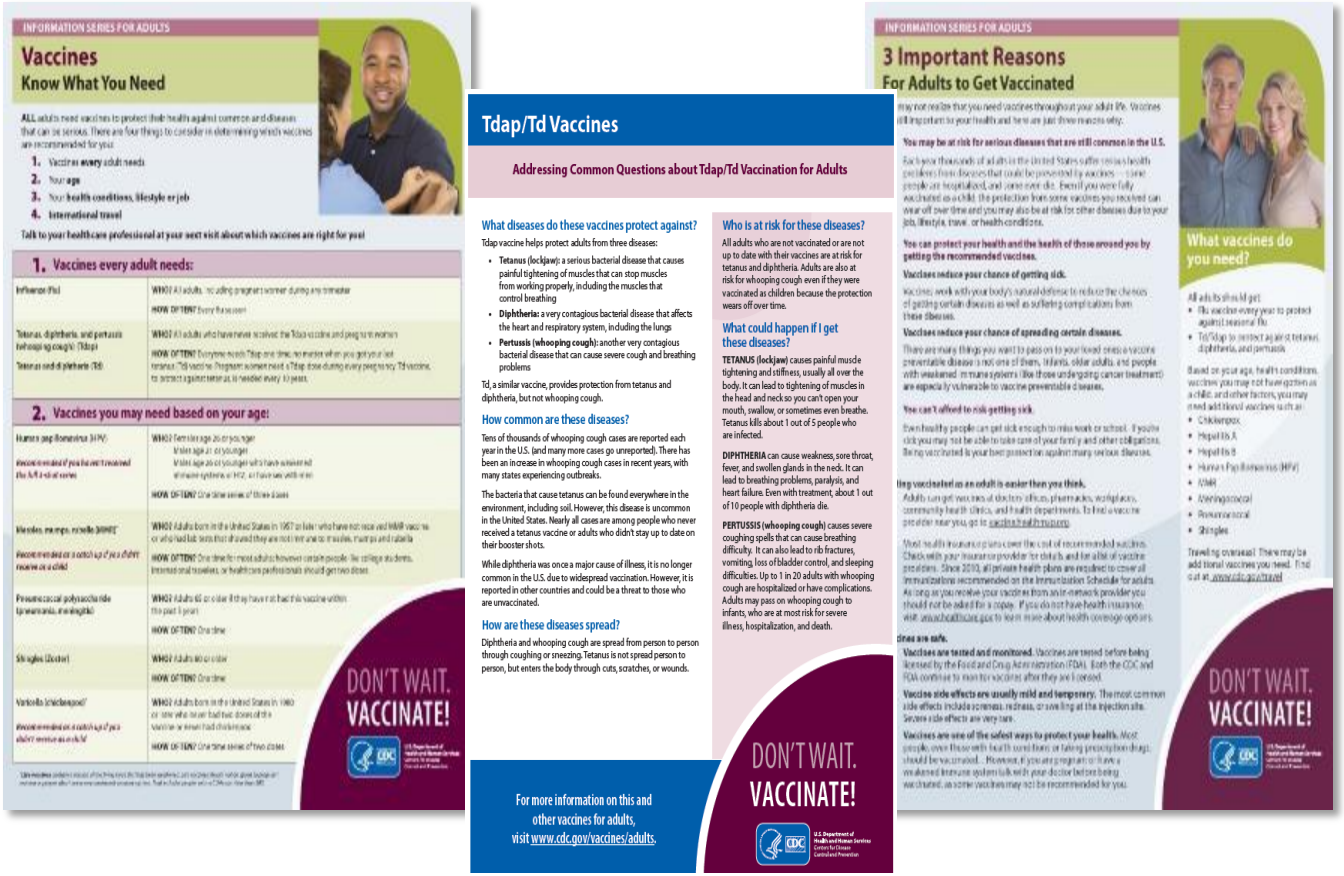
CDC Adult Patient Education Resources

- Patient Education Portal: 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
- Website: www.cdc.gov/vaccines/adults





General Fact Sheets for Adults



www.cdc.gov/vaccines/AdultPatientEd

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.

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

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

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Administration or Referral

THE NATIONAL VACCINE PROGRAM OFFICE

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**
  www.cdc.gov/HAI/settings/outpatient/outpatient-care-guidelines.html
- **Chart of Medical Management of Vaccine Reactions in Patients**
  www.immunize.org/catg.d/p3082.pdf

Immunization Action Coalition

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.

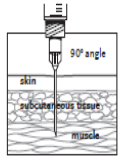
The DVD "Immunization Techniques: Best Practices with Infants, Children, and Adults" ensures that staff administer vaccines correctly. Order online at www.immunize.org/dvd

		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. Rechecks vial label.					
	5. Labels each filled syringe or uses labeled tray to keep them identified.					
	6. Demonstrates knowledge of proper vaccine handling, e.g. protects MMR from light, logs refrigerator temperature.					

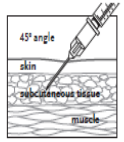
Administering Vaccines to Adults: Dose, Route, Site, and Needle Size

VACCINE	DOSE	ROUTE
Hepatitis A (HepA)	≤18 yrs: 0.5 mL ≥19 yrs: 1.0 mL	IM
Hepatitis B (HepB)	≤19 yrs: 0.5 mL ≥20 yrs: 1.0 mL	IM
HepA-HepB (Twinrix)	≥18 yrs: 1.0 mL	IM
Human papillomavirus (HPV)	0.5 mL	IM
Influenza, live attenuated (LAIV)	0.2 mL (0.1 mL into each nostril)	NAS (Intranasal spray)
Influenza, inactivated (IIV) **and recombinant** (RIV)	0.5 mL	IM
Influenza (IIV) **Fluzone Intradermal, for ages 18 through 64 years**	0.1 mL	ID (Intradermal)
Measles, Mumps, Rubella (MMR)	0.5 mL	SubCut
Meningococcal conjugate (MenACWY)	0.5 mL	IM
Meningococcal protein (MenB)	0.5 mL	IM
Meningococcal serogroup B (MenB)	0.5 mL	IM
Meningococcal polysaccharide (MPSV)	0.5 mL	SubCut
Pneumococcal conjugate (PCV13)	0.5 mL	IM
Pneumococcal polysaccharide (PPSV)	0.5 mL	IM or SubCut
Tetanus, Diphtheria (Td) **with Pertussis** (Tdap)	0.5 mL	IM
Varicella (VAR)	0.5 mL	SubCut
Zoster (HZV)	0.65 mL	SubCut

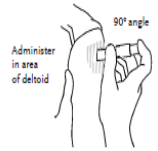
Intramuscular (IM) injection



Subcutaneous (SubCut) injection



Intradermal (ID) administration of Fluzone ID vaccine



Intranasal (NAS) administration of Flumist (LAIV) vaccine

Injection Site and Needle Size

Subcutaneous (SubCut) injection – Use a 23–25 gauge, ⅝" needle. Inject in fatty tissue over triceps.

Intramuscular (IM) injection – Use a 22–25 gauge needle. Inject in deltoid muscle of arm. Choose the needle length as indicated below:

Gender/Weight	Needle Length
Female or male less than 130 lbs	⅝"–1"
Female or male 130–152 lbs	1"
Female 153–200 lbs	1–1½"
Male 153–260 lbs	
Female 200+ lbs	1½"
Male 260+ lbs	

* A ⅝" needle may be used for patients weighing less than 130 lbs (<60 kg) for IM injection in the deltoid muscle only if the subcutaneous tissue is not bunched and the injection is made at a 90-degree angle.

NOTE: Always refer to the package insert included with each biologic for complete vaccine administration information. CDC's Advisory Committee on Immunization Practices (ACIP) recommendations for the particular vaccine should be reviewed as well. Access the ACIP recommendations at www.immunize.org/acip.

www.immunize.org

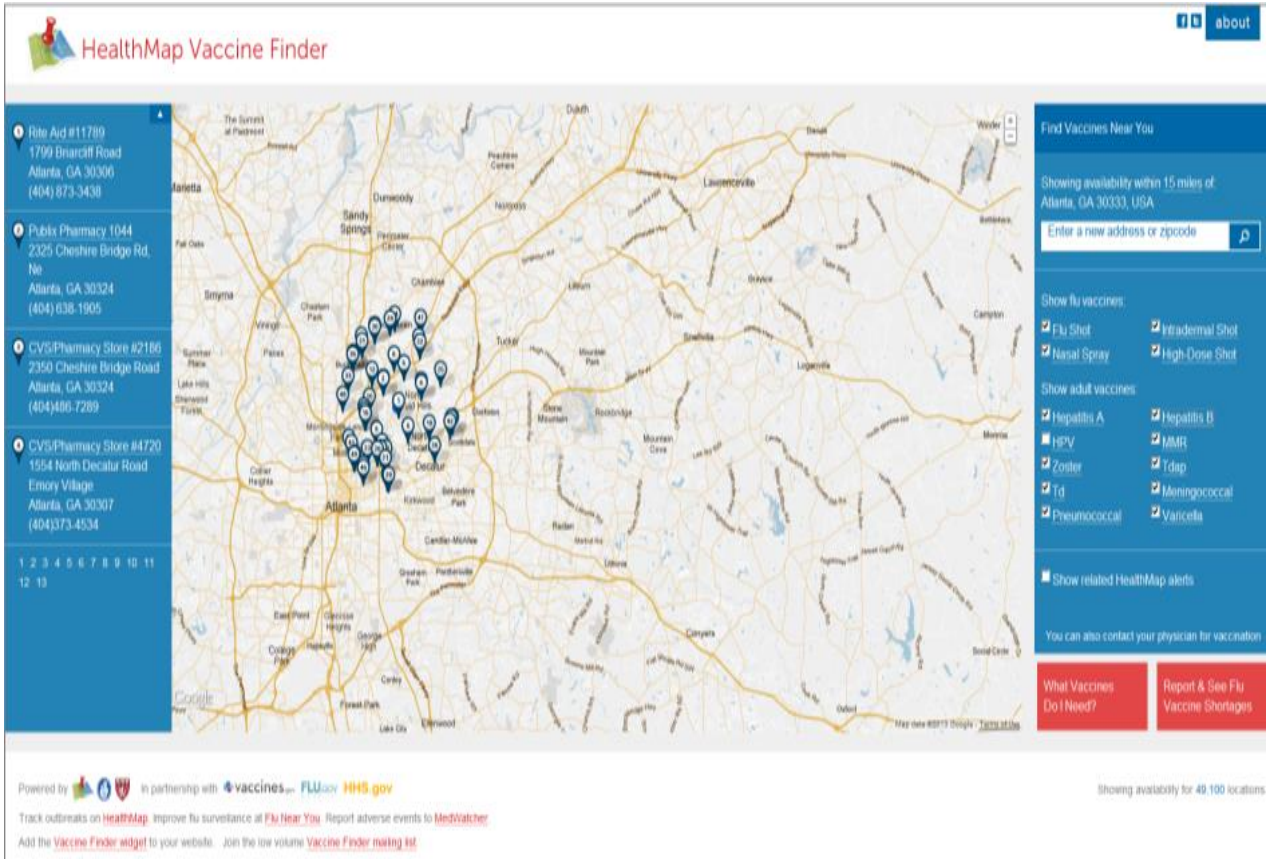
THE NATIONAL VACCINE PROGRAM OFFICE

Vaccine Referral Options

- **Pharmacies**
- **HealthMap Vaccine Finder** 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/
  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

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

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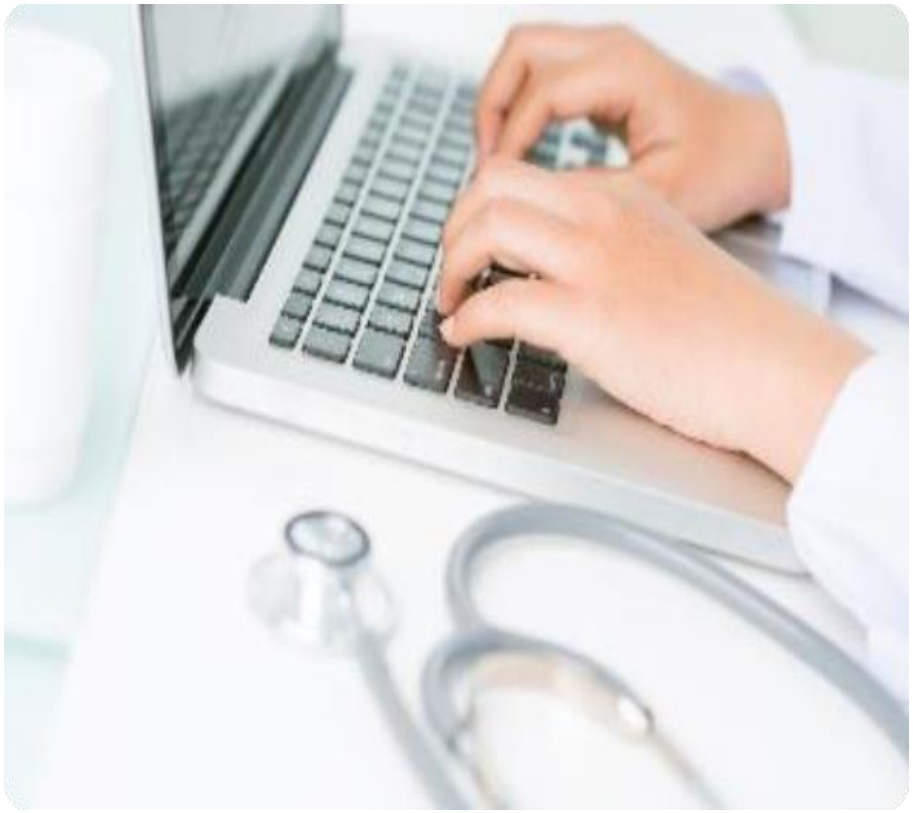
Documentation



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Strategies for Documentation

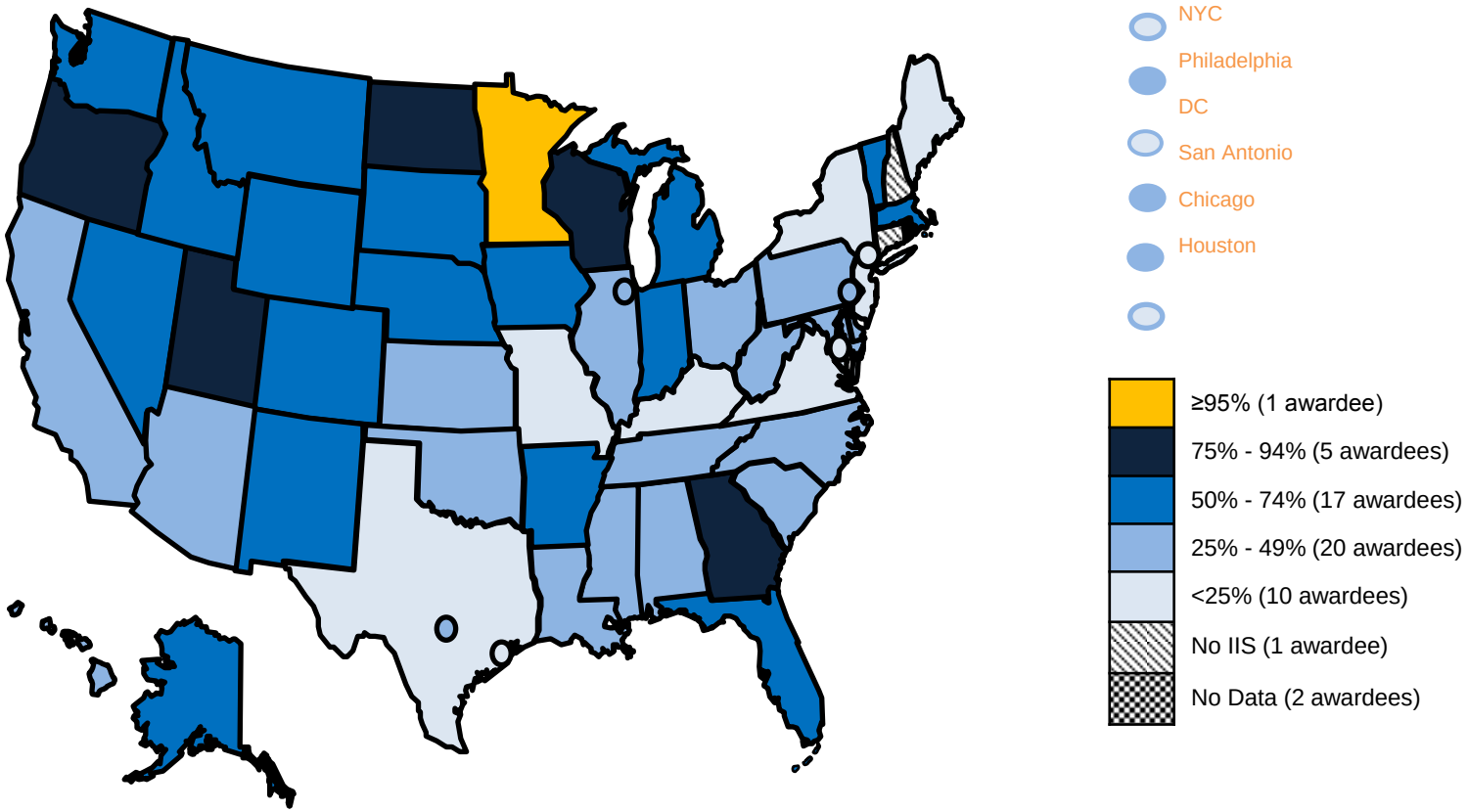
- Document vaccination in patients' medical records
- Provide patients with vaccine documentation for their personal medical records, e.g. shot card
- Follow-up with patient or referring provider to document the vaccine given
- Enter immunization into city or state immunization registry

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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- National Adult and Influenza Immunization Summit

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Addressing Challenges in Vaccine and Vaccination Financing

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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

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)

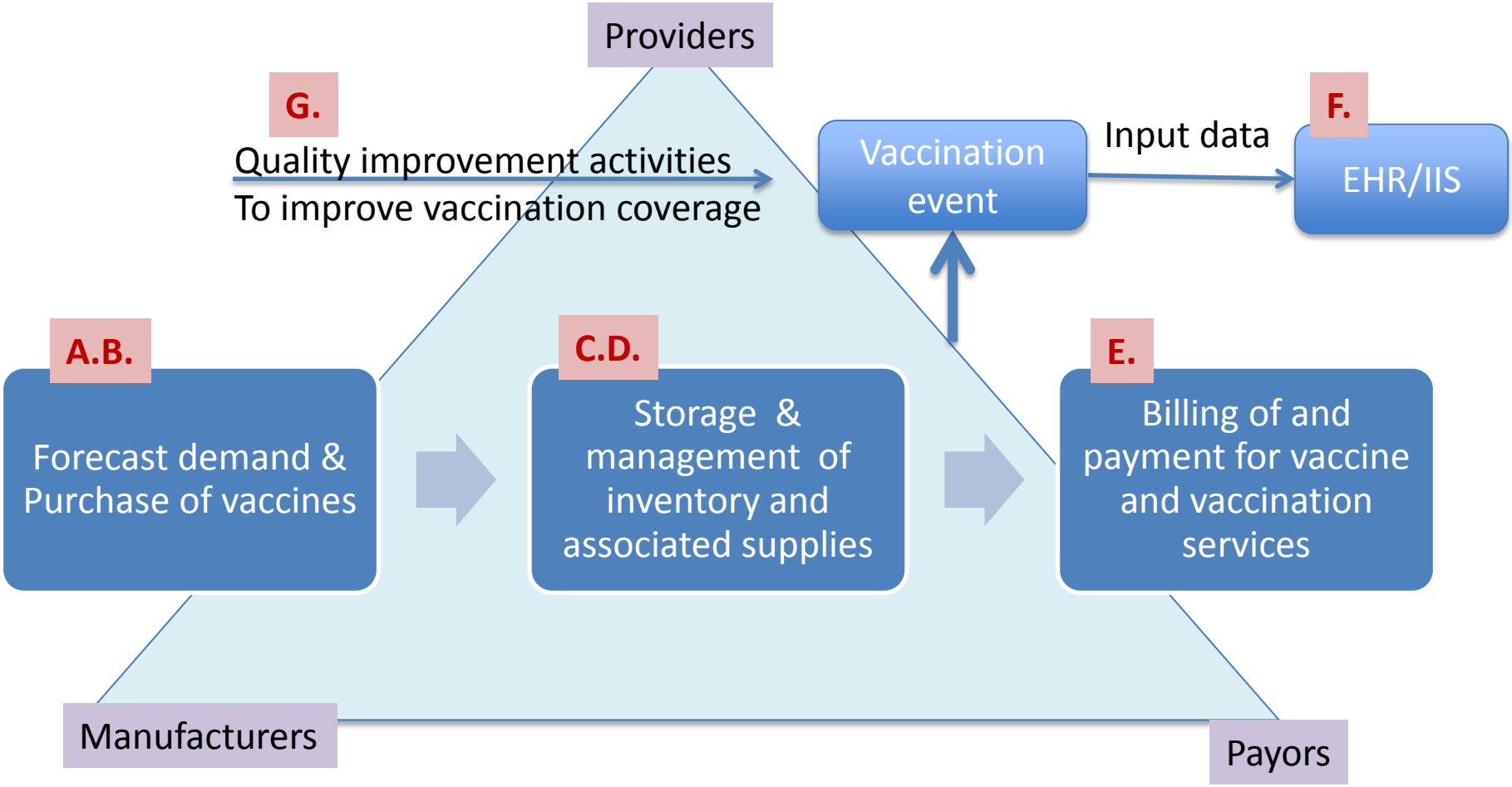
II. Some Challenges Facing Adult Providers

First Dollar Coverage

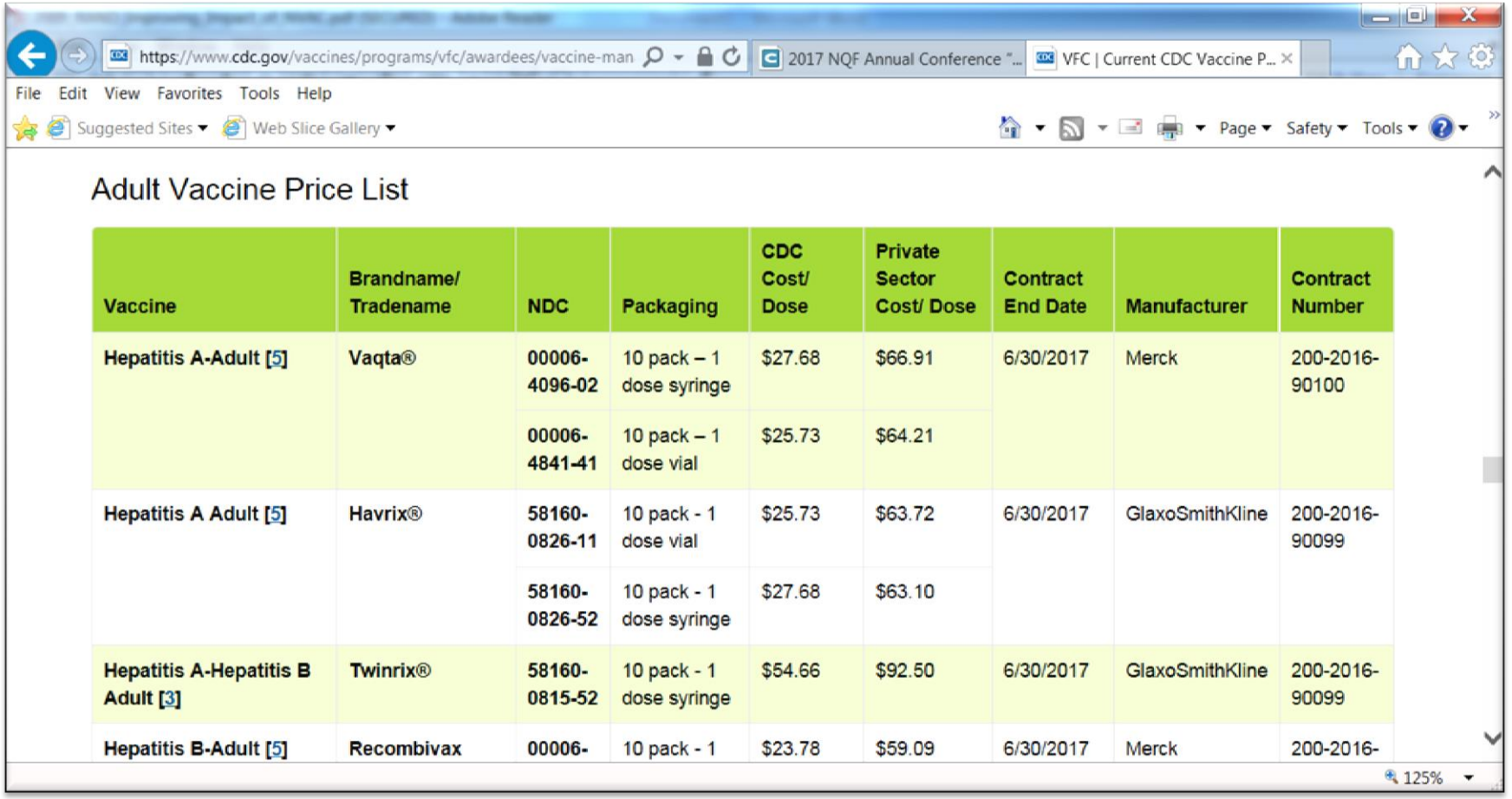
- Applies to the patient perspective
- FDC means:
  - ACIP-recommended vaccines at no cost-sharing to the patient (no copays, co-insurance, deductibles)
- What does financing mean for the provider?

Managing The Business Of Vaccination: Providers

Actually More Complex



CDC Vaccine Price List



https://www.cdc.gov/vaccines/programs/vfc/awardees/vaccine-man

2017 NQF Annual Conference "...

VFC | Current CDC Vaccine P...

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Adult Vaccine Price List

Vaccine	Brandname/ Tradename	NDC	Packaging	CDC Cost/ Dose	Private Sector Cost/ Dose	Contract End Date	Manufacturer	Contract Number
Hepatitis A-Adult [5]	**Vaqta®**	**00006-4096-02**	10 pack – 1 dose syringe	$27.68	$66.91	6/30/2017	Merck	200-2016-90100
		00006-4841-41	10 pack – 1 dose vial	$25.73	$64.21			
Hepatitis A Adult [5]	**Havrix®**	**58160-0826-11**	10 pack - 1 dose vial	$25.73	$63.72	6/30/2017	GlaxoSmithKline	200-2016-90099
		58160-0826-52	10 pack - 1 dose syringe	$27.68	$63.10			
Hepatitis A-Hepatitis B Adult [3]	**Twinrix®**	**58160-0815-52**	10 pack - 1 dose syringe	$54.66	$92.50	6/30/2017	GlaxoSmithKline	200-2016-90099
Hepatitis B-Adult [5]	**Recombivax**	**00006-**	10 pack - 1	$23.78	$59.09	6/30/2017	Merck	200-2016-

125%

Source:
https://www.cdc.gov/vaccines/programs/vfc/awardees/vaccine-management/price-list/index.html

National Vaccine Advisory Committee (NVAC)
National Adult Immunization Plan (NAIP)
National Adult and Influenza Immunization Summit (NAIIS)

III. Efforts to Address Challenges

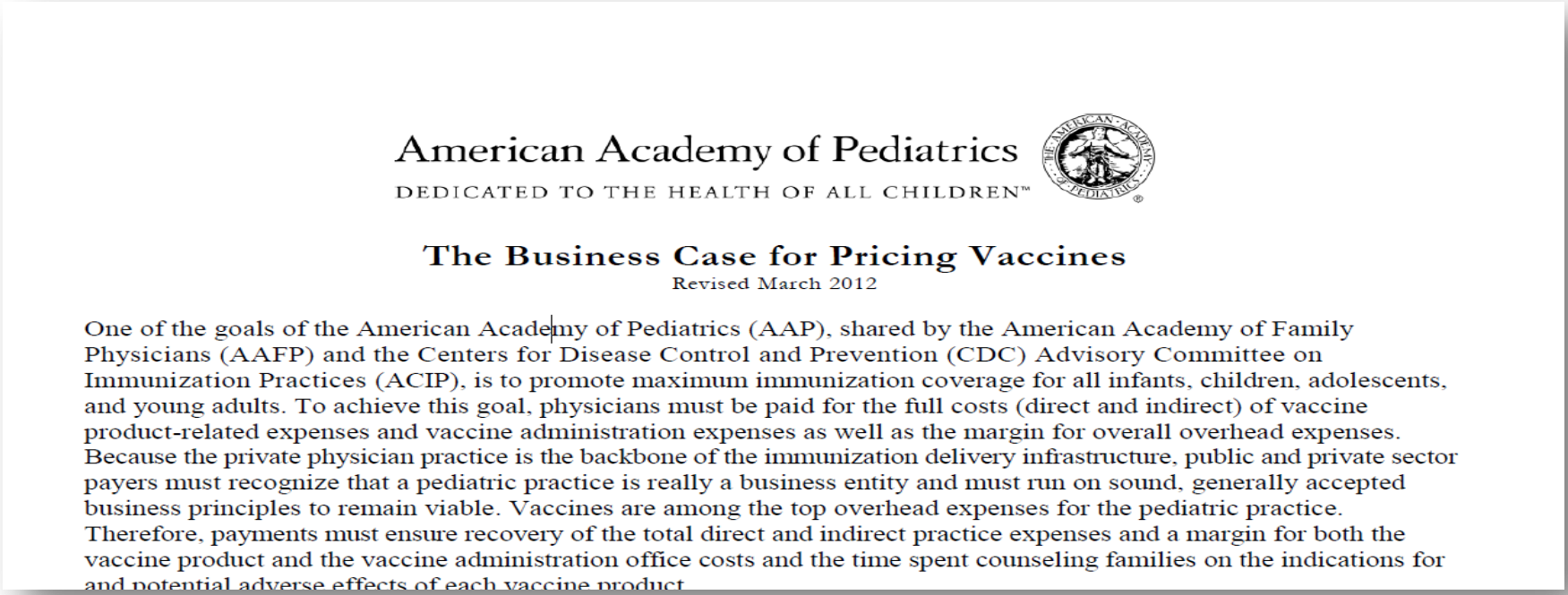
Implementing NVAC Recommendations: Building on NVAC Work

- 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



American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

The Business Case for Pricing Vaccines

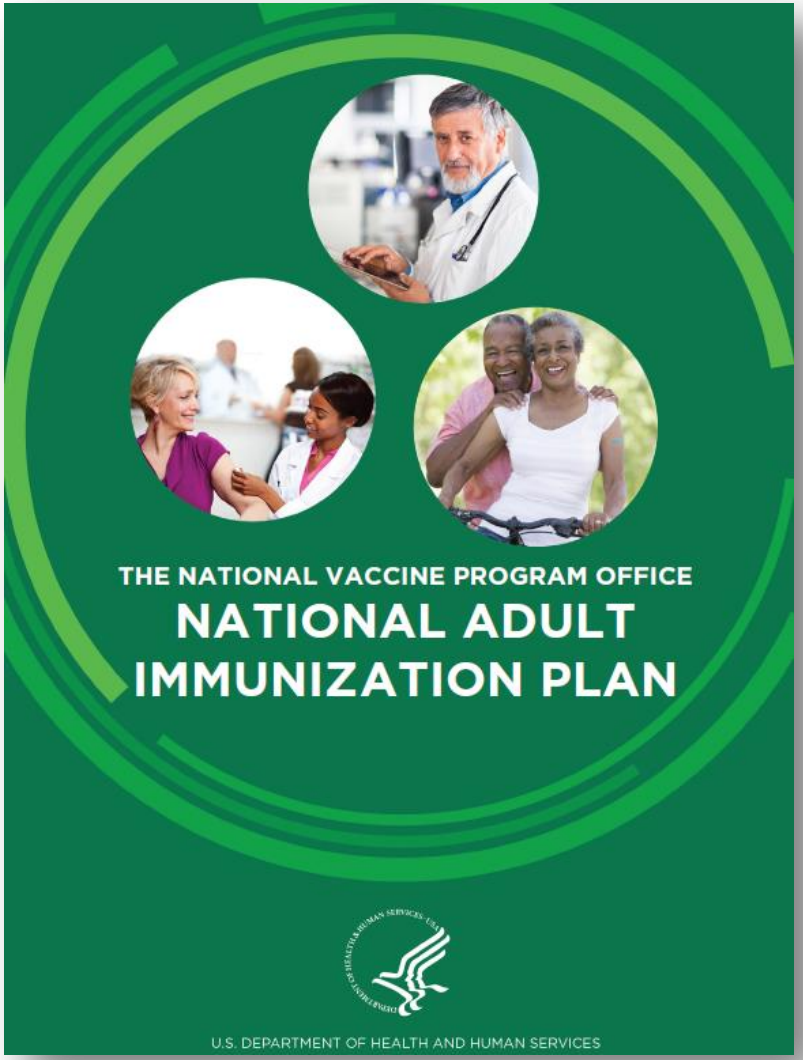
Revised March 2012

One of the goals of the American Academy of Pediatrics (AAP), shared by the American Academy of Family Physicians (AAFP) and the Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practices (ACIP), is to promote maximum immunization coverage for all infants, children, adolescents, and young adults. To achieve this goal, physicians must be paid for the full costs (direct and indirect) of vaccine product-related expenses and vaccine administration expenses as well as the margin for overall overhead expenses. Because the private physician practice is the backbone of the immunization delivery infrastructure, public and private sector payers must recognize that a pediatric practice is really a business entity and must run on sound, generally accepted business principles to remain viable. Vaccines are among the top overhead expenses for the pediatric practice. Therefore, payments must ensure recovery of the total direct and indirect practice expenses and a margin for both the vaccine product and the vaccine administration office costs and the time spent counseling families on the indications for and potential adverse effects of each vaccine product.

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



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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

National Adult and Influenza Immunization Summit

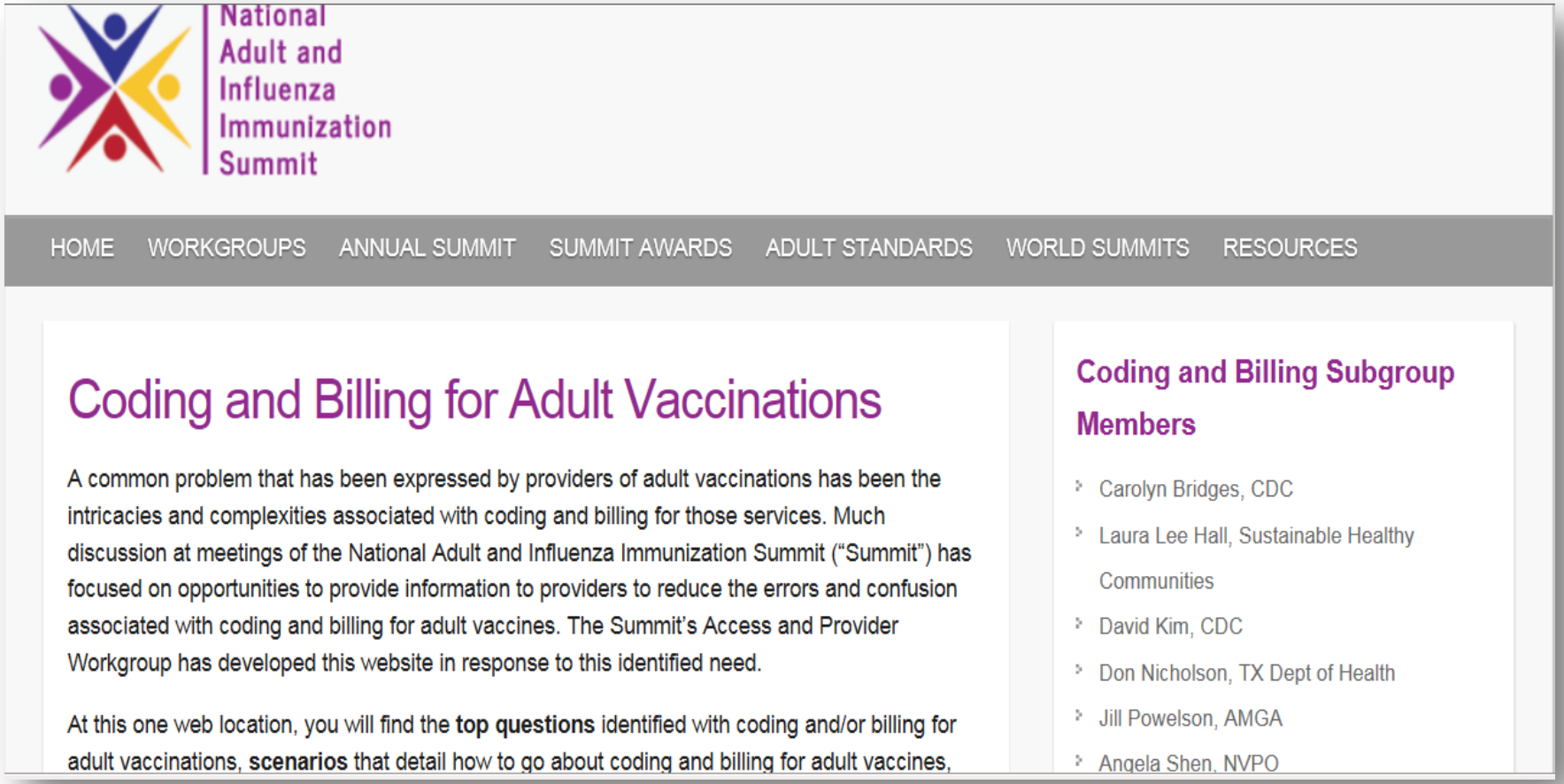
www.izsummitpartners.org

- **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

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 Website



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
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- 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