# 2016 Immunization Update and Adult Immunization Standards

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## Disclosures

- Raymond Strikas is a federal government employee with no financial interest or conflict with the manufacturer of any product named in this presentation.
- I will discuss the off-label use of serogroup meningococcal B vaccine, human papillomavirus (HPV) vaccine, and tetanus, reduced-diphtheria toxoid, and acellular pertussis vaccine (Tdap)

## What's New?

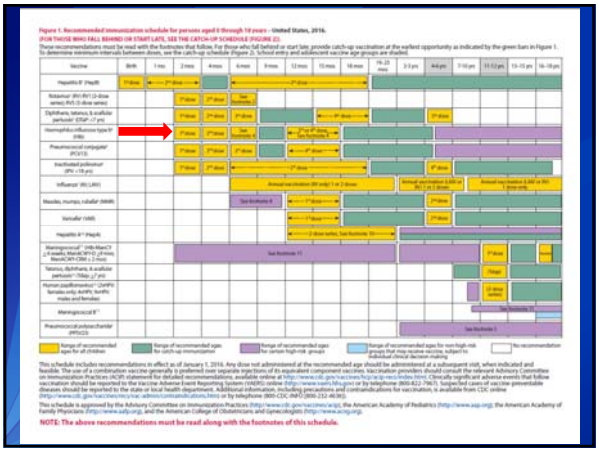
- **2016 Immunization Schedules**
- **Serogroup B meningococcal vaccine**
- **9vHPV, and possible two dose schedule**
- **Pertussis vaccination and pregnancy**
- **Influenza vaccine recommendations for 2016-17**
- **Adult Immunization Standards**
- **Immunization Resources**

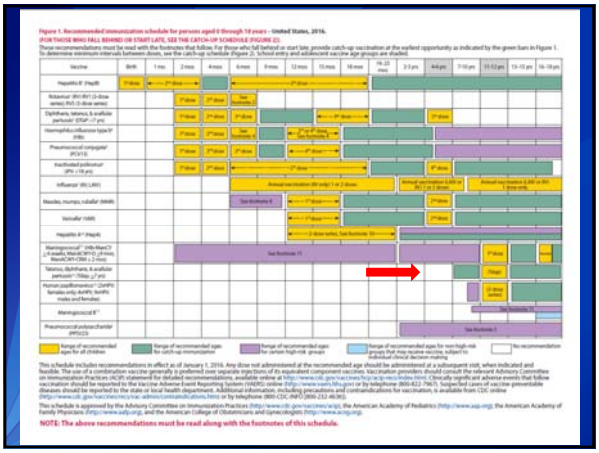
## Comparison of 20th Century Annual Morbidity and Current Morbidity: Vaccine-Preventable Diseases

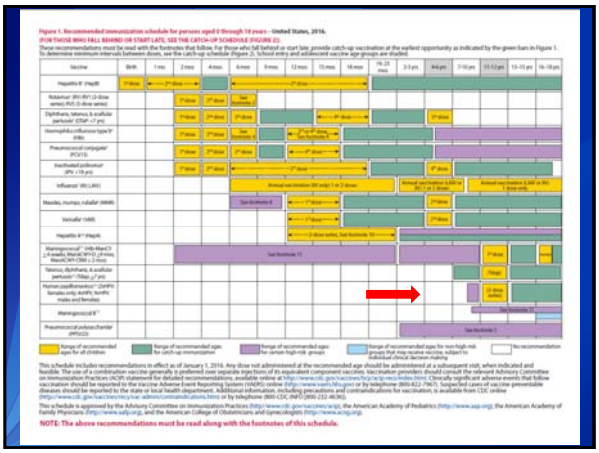
| Disease | 20th Century Annual Morbidity† | 2014 Reported Cases †† | Percent Decrease |
|---|---|---|---|
| Diphtheria | 21,053 | 1 | > 99% |
| Measles | 530,217 | 628 | > 99% |
| Mumps | 162,344 | 1,151 | 99% |
| Pertussis | 200,752 | 32,971 | 86% |
| Polio (paralytic) | 16,316 | 0 | 100% |
| Rubella | 47,745 | 8 | > 99% |
| Congenital Rubella Syndrome | 152 | 0 | 100% |
| Tetanus | 580 | 21 | 96% |
| *Haemophilus influenzae* | 20,000 | 27* | > 99% |
| Total | 999,159 | 34,807 | 97% |
| *Vaccine Adverse Events* | Not available | ~30,000 | Not available |

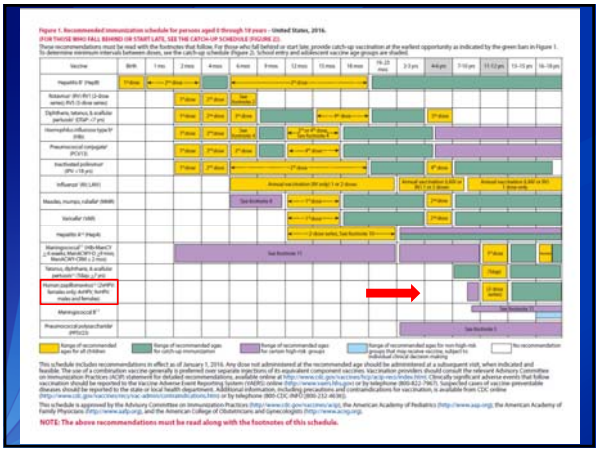
† JAMA. 2007;298(18):2155-2163
†† CDC. MMWR January 9, 2015 / 63(53);ND-733-ND-746. (MMWR 2014 provisional week 53 data)
* *Haemophilus influenzae* type b (Hib) < 5 years of age. An additional 12 cases of Hib are estimated to have occurred among the 228 reports of Hi (< 5 years of age) with unknown serotype.

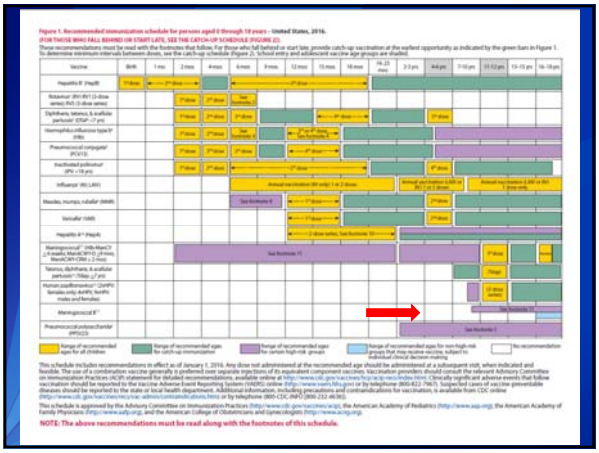
CDC
National Center for Immunization & Respiratory Diseases
Historical Comparisons of Vaccine-Preventable Disease Morbidity in the U.S.

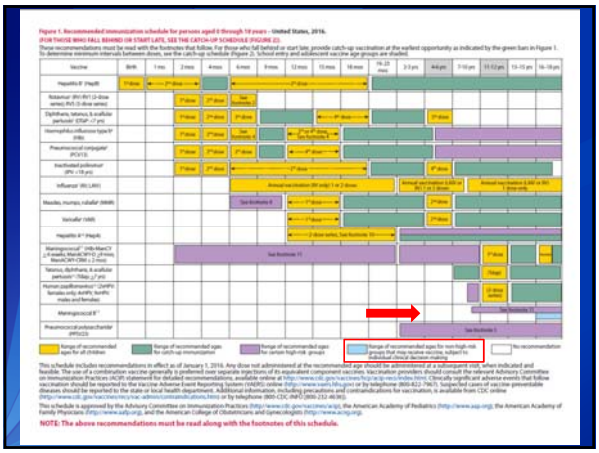


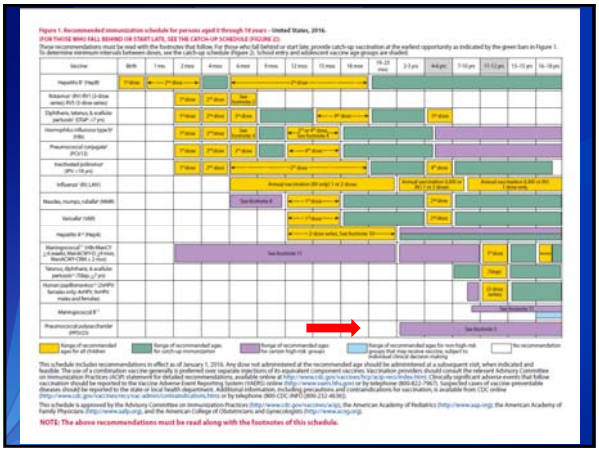


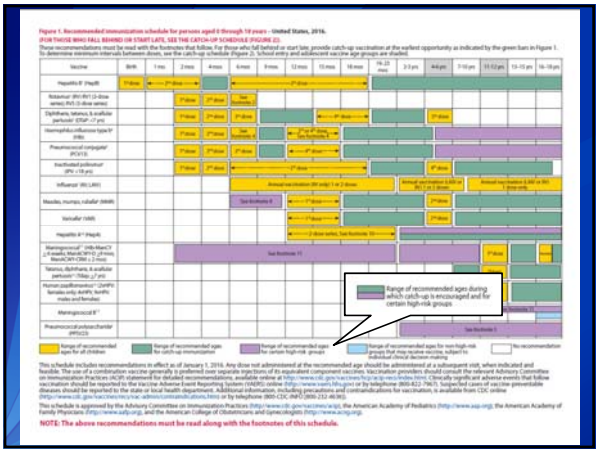


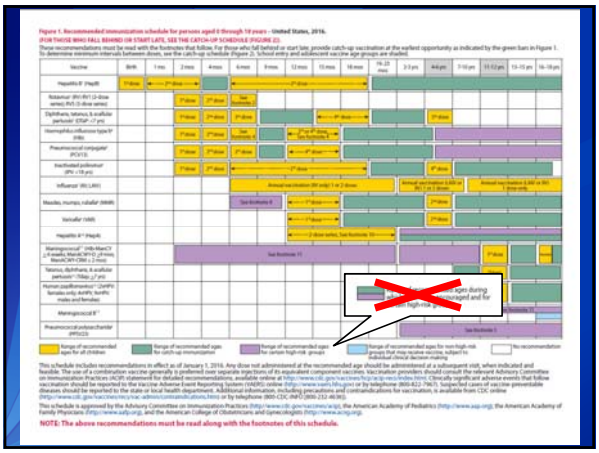


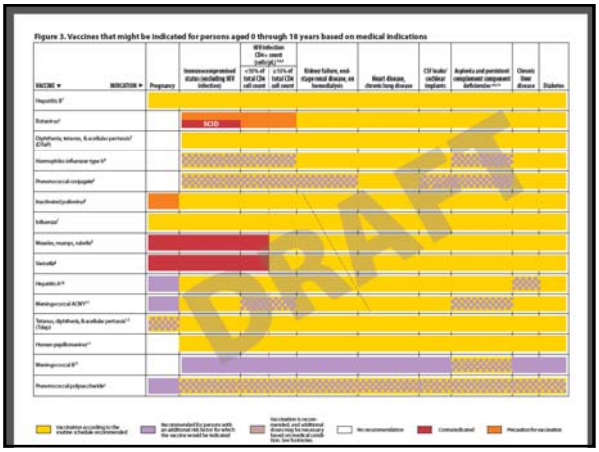







Range of recommended ages during which catch-up is encouraged and for certain high-risk groups





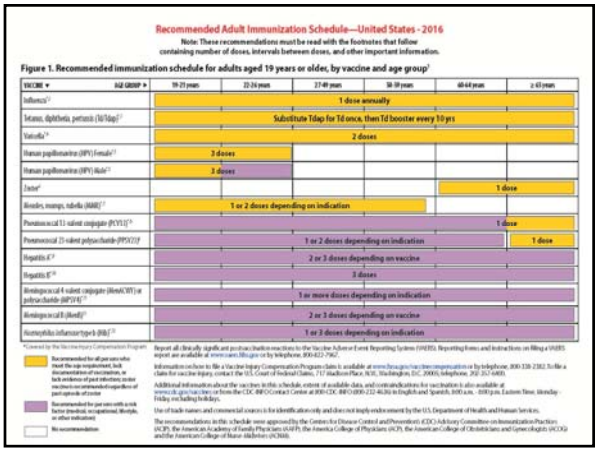

## 2016 Adult Immunization Schedule Updates

- Use of 9-Valent Human Papillomavirus (HPV) Vaccine: Updated HPV Vaccination Recommendations of the ACIP
  - MMWR March 27, 2015 / 64(11);300–304
  - www.cdc.gov/mmwr/preview/mmwrhtml/mm6411a3.htm
- Use of Serogroup B Meningococcal Vaccines in Persons Aged ≥10 Years at Increased Risk for Serogroup B Meningococcal Disease: Recommendations of the ACIP, 2015
  - MMWR June 12, 2015 / 64(22);608–612
  - www.cdc.gov/mmwr/preview/mmwrhtml/mm6422a3.htm
- Intervals Between PCV13 and PPSV23 Vaccines: Recommendations of the ACIP
  - MMWR September 4, 2015 / 64(34);944–947
  - www.cdc.gov/mmwr/preview/mmwrhtml/mm6434a4.htm
- Use of Serogroup B Meningococcal Vaccines in Adolescents and Young Adults: Recommendations of the ACIP, 2015
  - MMWR October 23, 2015 / 64(41);1171–1176
  - www.cdc.gov/mmwr/preview/mmwrhtml/mm6441a3.htm

## Updates in Pneumococcal Vaccination

- Intervals between PCV13 and PPSV23
  - PCV13 → PPSV23 interval is at least 1 year for immunocompetent adults aged ≥65 years
    - For adults with immunocompromising conditions, asplenia, CSF leak, or cochlear implant, the interval remains at least 8 weeks
- Correction of errata
  - "Adults aged ≥19 years with immunocompromising conditions" replaced "adults aged 19 through 64 years with immunocompromising conditions"
  - "Adults aged 19 through 64 years who smoke cigarettes or reside in nursing home or long-term care facilities: Administer PPSV23" removed from list of adults recommended for PPSV23
    - "Adults aged 19 through 64 years who smoke cigarettes" remains indication for PPSV23

DEPARTMENT OF HEALTH AND HUMAN SERVICES 16 CDC


Recommended Adult Immunization Schedule—United States - 2016

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

Figure 1. Recommended immunization schedule for adults aged 19 years or older, by vaccine and age group[1]

| VACCINE ▼ / AGE GROUP ▶ | 19-21 years | 22-26 years | 27-49 years | 50-59 years | 60-64 years | ≥ 65 years |
|---|---|---|---|---|---|---|
| Influenza[2] | 1 dose annually | | | | | |
| Tetanus, diphtheria, pertussis (Td/Tdap)[3] | Substitute Tdap for Td once, then Td booster every 10 yrs | | | | | |
| Varicella[4] | 2 doses | | | | | |
| Human papillomavirus (HPV) Female[5] | 3 doses | | | | | |
| Human papillomavirus (HPV) Male[5] | 3 doses | | | | | |
| Zoster[6] | | | | | 1 dose | |
| Measles, mumps, rubella (MMR)[7] | 1 or 2 doses depending on indication | | | | | |
| Pneumococcal 13-valent conjugate (PCV13)[8] | | | | | 1 dose | |
| Pneumococcal 23-valent polysaccharide (PPSV23)[9] | 1 or 2 doses depending on indication | | | | | 1 dose |
| Hepatitis A[10] | 2 or 3 doses depending on vaccine | | | | | |
| Hepatitis B[11] | 3 doses | | | | | |
| Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4)[12] | 1 or more doses depending on indication | | | | | |
| Meningococcal B (MenB)[13] | 2 or 3 doses depending on vaccine | | | | | |
| Haemophilus influenzae type b (Hib)[14] | 1 or 3 doses depending on indication | | | | | |

*Covered by the Vaccine Injury Compensation Program

Recommended for all persons who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection; zoster vaccine is recommended regardless of past episode of zoster

Recommended for persons with a risk factor (medical, occupational, lifestyle, or other indication)

No recommendation

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at www.vaers.hhs.gov or by telephone, 800-822-7967.

Information on how to file a Vaccine Injury Compensation Program claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382. To file a claim for vaccine injury, contact the U.S. Court of Federal Claims, 717 Madison Place, N.W., Washington, D.C. 20005, telephone, 202-357-6400.

Additional information about the vaccines in this schedule, extent of available data, and contraindications for vaccination is also available at www.cdc.gov/vaccines or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 8:00 a.m. – 8:00 p.m. Eastern Time, Monday – Friday, excluding holidays.

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

The recommendations in this schedule were approved by the Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP), the American Academy of Family Physicians (AAFP), the America College of Physicians (ACP), the American College of Obstetricians and Gynecologists (ACOG) and the American College of Nurse-Midwives (ACNM).

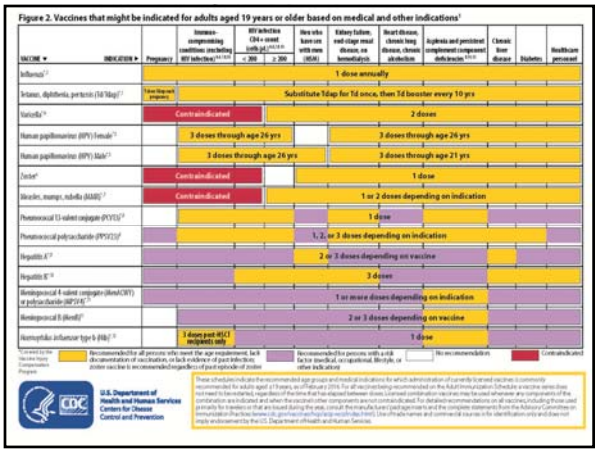


Figure 2. Vaccines that might be indicated for adults aged 19 years or older based on medical and other indications[1]

| VACCINE ▼ / INDICATION ▶ | Pregnancy | Immunocompromising conditions (excluding HIV infection)[15,16,17] | HIV infection CD4+ count (cells/µL)[15,16,18] < 200 | HIV infection CD4+ count (cells/µL)[15,16,18] ≥ 200 | Men who have sex with men (MSM) | Kidney failure, end-stage renal disease, on hemodialysis | Heart disease, chronic lung disease, chronic alcoholism | Asplenia and persistent complement component deficiencies[15,19] | Chronic liver disease | Diabetes | Healthcare personnel |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Influenza[2] | 1 dose annually | | | | | | | | | | |
| Tetanus, diphtheria, pertussis (Td/Tdap)[3] | Substitute Tdap for Td once, then Td booster every 10 yrs | | | | | | | | | | |
| Varicella[4] | Contraindicated | 2 doses | | | | | | | | | |
| Human papillomavirus (HPV) Female[5] | 3 doses through age 26 yrs | | | 3 doses through age 26 yrs | | | | | | | |
| Human papillomavirus (HPV) Male[5] | 3 doses through age 26 yrs | | | 3 doses through age 21 yrs | | | | | | | |
| Zoster[6] | Contraindicated | 1 dose | | | | | | | | | |
| Measles, mumps, rubella (MMR)[7] | Contraindicated | 1 or 2 doses depending on indication | | | | | | | | | |
| Pneumococcal 13-valent conjugate (PCV13)[8] | 1 dose | | | | | | | | | | |
| Pneumococcal polysaccharide (PPSV23)[9] | 1, 2, or 3 doses depending on indication | | | | | | | | | | |
| Hepatitis A[10] | 2 or 3 doses depending on vaccine | | | | | | | | | | |
| Hepatitis B[11] | 3 doses | | | | | | | | | | |
| Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4)[12] | 1 or more doses depending on indication | | | | | | | | | | |
| Meningococcal B (MenB)[13] | 2 or 3 doses depending on vaccine | | | | | | | | | | |
| Haemophilus influenzae type b (Hib)[14] | 1 dose | | | | | | | | | | |
| | 3 doses post-HSCT recipients only | | | | | | | | | | |

*Covered by the Vaccine Injury Compensation Program

Recommended for all persons who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection; zoster vaccine is recommended regardless of past episode of zoster

Recommended for persons with a risk factor (medical, occupational, lifestyle, or other indication)

No recommendation

Contraindicated

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

These schedules indicate the recommended age groups and medical indications for which administration of currently licensed vaccines is commonly recommended for adults aged ≥19 years, as of February 2016. For all vaccines being recommended on the Adult Immunization Schedule, a vaccine series does not need to be started, regardless of the time that has elapsed between doses. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine's other components are not contraindicated. For detailed recommendations on all vaccines, including those used primarily for travelers or that are issued during the year, consult the manufacturer's package inserts and the complete statements from the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/hcp/acip-recs/index.html). Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

## Meningococcal Disease

## Meningococcal B Vaccines

| Product Name/ACIP Abbreviation | FDA Age Indications | Dosage/Route/Schedule |
|---|---|---|
| Trumenba ® MenB-FHbp | 10 through 25 years of age | • 2 or 3 doses – 0.5 mL each<br>• IM injection<br>• 0-, 1-2-, and 6-month |
| Bexsero® MenB-4C | 10 through 25 years of age | • 2 doses – 0.5 mL each<br>• IM injection<br>• 0, 1–6 month |

## ACIP MenB Recommendations

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

*ACIP off-label recommendation
**Including sickle cell disease
www.cdc.gov/mmwr/preview/mmwrhtml/mm6422a3.htm?s_cid=mm6422a3_w

## ACIP MenB Recommendations

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

Note: MenACWY is recommended

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

## ACIP MenB Recommendations

**MenB vaccine series may be administered to adolescents and young adults 16 through 23 years of age to provide short-term protection against most strains of serogroup B meningococcal disease. The preferred age for MenB vaccination is 16 through 18 years of age. ***

**If Trumenba is used, two doses at 0 and 6 months are recommended for healthy adolescents and young adults 16-23 years (ACIP recommendation, Oct 19, 2016).**

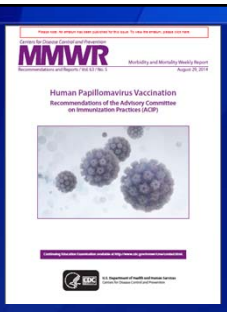
* Permissive recommendation (Category B)

## Meningococcal Serogroup B Vaccine Recommendations

- Brands are NOT interchangeable in the same vaccinee
- If two different brands administered to one vaccine – pick which brand is invalid
- Continue with the other brand
- Must use a 4 week interval after the invalid brand, plus remember minimum interval rules between doses in the series of the same brand

## Meningococcal Serogroup B Vaccine Recommendations

- **Minimum intervals should be observed between doses of the same vaccine**
  - Bexsero (time zero, time 1 month)
  - Trumenba (time zero, time 1-2 months, time 6 months);
    - Two dose schedule 0, 6 months approved by FDA; ACIP recommended Oct, 2016
  - If the minimum interval is violated, no need to repeat




## HUMAN PAPILLOMAVIRUS (HPV) VACCINATION

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

## Updated ACIP Recommendations

- **Vaccinate males and females at 11-12 years.***
- **Catch up those previously unvaccinated or missing doses:**
  - Females age 13 through 26 years.
  - Males age 13 though 21 years.
  - High-risk males age 22 through 26 years.
  - Men who have sex with men and immunocompromised men (including HIV-infected men).
- **Use:**
  - 2vHPV, 4vHPV, or 9vHPV for females.
  - 4vHPV or 9vHPV for males.

*Vaccination series can be started at 9 years of age

## Updated ACIP Recommendations Interchangeability*

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

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

## Updated ACIP Recommendations Administration

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

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

## 9vHPV vaccination for persons who completed a HPV vaccination series

- The manufacturer did not seek an indication for 9vHPV vaccination for persons who previously completed a HPV vaccination series
- A study of 9vHPV in prior complete 4vHPV vaccinees was conducted
- No data on complete 9vHPV following partial 4vHPV series

## New Recommendations (FDA approved, ACIP voted)

- ACIP recommends routine HPV vaccination at age 11 or 12 years*
- A 2-dose schedule may be used for persons 9 - 14 years of age.+
  - The second dose should be administered 6 to 12 months after the first dose.
- *Vaccination series can be started at age 9 years
  - +A 3-dose series can be given (0, 1–2, 6 months)
- Note: Yellow text indicates Oct 19, 2016 ACIP/CDC recommendation, to be published

## New Recommendations (FDA approval, ACIP voted)

- Vaccination is also recommended for females through 26 years and for males through 21 years not previously vaccinated For persons initiating vaccination before their 15th birthday, ACIP recommends 2 doses of HPV vaccine. The second dose should be administered 6 to 12 months after the first dose.*
- For persons initiating the vaccination series after their 15th birthday, ACIP recommends 3 doses of HPV vaccine. The second dose should be administered 1 to 2 months after the first dose and the third dose 6 months after the first dose (0, 1–2, and 6 month schedule).
- *A 3-dose series can be given (0, 1–2, 6 months)
- Note: Yellow text indicates Oct. 19, 2016 ACIP/CDC recommendations to be published

## New Recommendations (FDA approval, ACIP voted)

- **If vaccination series started before 15th birthday**
- **Persons who started the HPV vaccination series with 9vHPV, 4vHPV or 2vHPV and**
  - received 2 doses $\geq$ 6 months apart, are considered adequately vaccinated
  - received 2 doses < 6 months apart, should receive a third dose $\geq$ 6 months after dose 1
  - received 1 dose, should receive a second dose $\geq$ 6 months after dose 1

Note: Yellow text indicates Oct. 19, 2016 ACIP/CDC recommendations to be published

## New Recommendations (FDA approval, ACIP voted)

- **If vaccination series started after 15th birthday**
- Persons who started the HPV vaccination series with 9vHPV, 4vHPV or 2vHPV and
  - received 3 doses with the third dose ≥ 6 months after dose 1, are considered adequately vaccinated
  - received 2 doses, should receive a third dose ≥ 6 months after dose 1
  - received 1 dose, should complete a 3-dose series (0, 1–2, 6 months)

Note: Yellow text indicates Oct. 19, 2016 ACIP/CDC recommendations to be published

## New Recommendations (FDA approval, ACIP voted)

- For immunocompromised patients of any age, including those with HIV infection, ACIP will likely recommend 3 doses of HPV vaccine (0, 1–2, 6 months)

Note: Yellow text indicates Oct. 19, 2016 ACIP/CDC recommendations to be published

Updated Recommendations for Use of Tetanus Toxoid, Reduced Diphtheria Toxoid, and Acellular Pertussis (Tdap) Vaccine in Adults Aged 65 Years and Older — Advisory Committee on Immunization Practices (ACIP), 2012

Updated Recommendations for Use of Tetanus Toxoid, Reduced Diphtheria Toxoid, and Acellular Pertussis Vaccine (Tdap) in Pregnant Women — Advisory Committee on Immunization Practices (ACIP), 2012

## PERTUSSIS VACCINATION OF PREGNANT WOMEN

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

## ACIP Conclusions: Tdap and Pregnancy

- **Maternal antibodies from women immunized before pregnancy waned quickly (Healy 2012)**
  - Concentration of maternal antibodies unlikely high enough to provide passive protection to infants
- **A single dose of Tdap during one pregnancy is insufficient to provide protection for subsequent pregnancies**
- **One UK study suggests up to 90% of infants are protected against pertussis by vaccination of mother during pregnancy (Clin Infect Dis. 2015;60(3):333–7)**

## Bottom Line

An infant's first dose of pertussis vaccine is the one you administer to his/her mom!

## ACIP Recommendations: Tdap and Pregnancy

- **Administer Tdap to pregnant women during each pregnancy, regardless of previous Tdap vaccination history**
- **Ideally vaccinate between 27 through 36 weeks gestation, although Tdap may be given at any time during pregnancy**
  - Vaccinating earlier in the 27-36 weeks will maximize passive antibody transfer to the infant

*ACIP off-label recommendation; *MMWR*, Vol. 62 No. 7; Feb, 22, 2013, and ACIP vote, Oct 19, 2016

## Special Situations and Pregnant Women

- **Unknown or incomplete tetanus vaccination: should complete the 3-dose primary series**
  - Recommended schedule is 0, 4 weeks, and 6 through 12 months
  - Tdap should replace 1 dose of Td, preferably between 27- 36 weeks gestation
- **Wound care: previously unvaccinated pregnant woman should be given Tdap if Td is indicated for wound management**

*ACIP off-label recommendation;
*MMWR.* Vol. 62 No. 7; February 22, 2013 and *MMWR* 2011:60 (No.41): 11424-1426

## Tdap and Postpartum Women

- **Postpartum women *not previously vaccinated* should be vaccinated immediately**
  - Including women who are breastfeeding
- **Do not administer Tdap to postpartum women who have already been vaccinated with Tdap**
  - Regardless of the length of time since Tdap vaccination

## Influenza Vaccines

- **Inactivated (IIV)**
  - Intramuscular or
  - Intradermal
- **Live attenuated vaccine (LAIV)**
  - Intranasal
  - NOT recommended for use in 2016-17 influenza season
    - Reason: low effectiveness against influenza A(H1N1)pdm09 in the United States during the 2013–14 and 2015–16 seasons
    - Because LAIV is still a licensed vaccine that might be available and some providers might elect to use, for informational purposes, reference is made to information and previous recommendations for its use.

## Inactivated Influenza Vaccine (IIV) Recommendations (1)

- Advisory Committee on Immunization Practices recommends annual influenza vaccination for all persons 6 months of age and older
- Protection of persons at higher risk for influenza-related complications should continue to be a focus of vaccination efforts as providers and programs transition to routine vaccination of all persons aged 6 months and older

## Inactivated Influenza Vaccine (IIV) Recommendations (2)

- When vaccine supply is limited, vaccination efforts should focus on delivering vaccination to the following groups of persons:
  - Children 6 months through 4 years (59 months) of age
  - Persons 50 years and older
  - Persons with chronic pulmonary (including asthma), cardiovascular (except hypertension), renal, hepatic, neurologic, hematologic, or metabolic disorders (including diabetes mellitus)
  - Persons who are immunosuppressed (including immunosuppression caused by medications or by human immunodeficiency virus)
  - Women who are or will be pregnant during the influenza season

## Inactivated Influenza Vaccine (IIV) Recommendations (3)

- Children 6 months through 18 years of age and receiving long-term aspirin therapy and who therefore might be at risk for experiencing Reye syndrome after influenza virus infection
- Residents of nursing homes and other chronic-care facilities
- American Indians/Alaskan natives
- Persons who are extremely obese (body-mass index is 40 or greater)
- Healthcare personnel
- Household contacts and caregivers of children younger than 5 years of age and adults 50 years of age or older, with particular emphasis on vaccinating contacts of children aged younger than 6 months
- Household contacts and caregivers of persons with medical conditions that put them at higher risk for severe complications from influenza

## Pregnancy and Inactivated Influenza Vaccine (IIV)

- Risk of hospitalization 4 times higher than nonpregnant women
- Risk of complications comparable to nonpregnant women with high-risk medical conditions
- Vaccination (with IIV) recommended if pregnant during influenza season
- Vaccination can occur during any trimester
- Several studies have demonstrated 36%-50% reduction in maternal influenza-related illness, and 41%-91% reduction in infant illness and/or hospitalization before 6 months of age.

MMWR 2016 / Vol. 65 (No. 5):12

## HIV Infection and Inactivated Influenza Vaccine (IIV)

- Persons with HIV at increased risk of complications from influenza
- IIV induces protective antibody titers in many HIV-infected persons
- IIV will benefit many HIV-infected persons; not clear if high dose IIV3 is superior to standard dose IIV

## Influenza Vaccines 2016-2017 Season

- Trivalent influenza vaccines will contain:
  - A/California/7/2009 (H1N1)- like virus
  - A/Hong Kong/4801/2014 (H3N2)-like virus;
  - B/Brisbane/60/2008-like virus (B/Victoria lineage).
- Quadrivalent influenza vaccines will contain:
  - these antigens, and also
  - B/Phuket/3073/2013-like virus (Yamagata lineage)

## Recent New Influenza Vaccine Licensures

- **An MF59-adjuvanted trivalent inactivated influenza vaccine (aIIV3), Fluad (Seqirus, Holly Springs, North Carolina), was licensed by FDA in November 2015 for persons aged ≥65 years.**
  - aIIV3 is an acceptable alternative to other vaccines licensed for persons in this age group.
- **Quadrivalent formulation of Flucelvax (cell culture based inactivated influenza vaccine [ccIIV4], (Seqirus), licensed by FDA in May 2016, for persons aged ≥4 years. ccIIV4 is an acceptable alternative to other vaccines licensed for persons in this age group.**
- **ACIP and CDC do not express a preference for any particular vaccine product.**

## Influenza Vaccination Recommendation

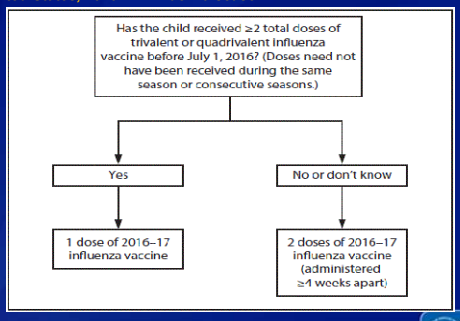
- **Providers should make a special effort to vaccinate persons at increased risk of complications of influenza**
  - Children 6 months through 4 years
  - Persons 50 years and older
  - Persons with underlying medical conditions
  - Pregnant women
- **Close contacts of high-risk persons**
- **Healthcare personnel**

See http://www.cdc.gov/mmwr/volumes/65/rr/pdfs/rr6505.pdf

## Inactivated Influenza Vaccine Schedule

| Group Age | Dose | No. Doses |
|---|---|---|
| **6-35 mos** | 0.25 mL | 1 or 2 |
| **3-8 yrs** | 0.50 mL | 1 or 2 |
| **9 yrs and older** | 0.50 mL | 1 |

**Influenza vaccine dosing algorithm for children aged 6 months through 8 years — Advisory Committee on Immunization Practices, United States, 2016–17 influenza season**




http://www.cdc.gov/mmwr/volumes/65/rr/rr6505.pdf

**Recommendations regarding influenza vaccination of persons who report allergy to eggs — Advisory Committee on Immunization Practices, United States, 2016–17 influenza season**

1. Persons with history of egg allergy who have experienced only hives after exposure to egg should receive influenza vaccine. Any licensed and recommended influenza vaccine … appropriate for the recipient's age and health status may be used.

2. Persons who report prior reactions to egg involving symptoms other than hives, such as angioedema, respiratory distress, lightheadedness, or recurrent emesis; or who required emergency medical intervention, may also receive any licensed and recommended influenza vaccine appropriate for the recipient's age and health status. Vaccine should be administered in an inpatient or outpatient medical setting (including but not necessarily limited to hospitals, clinics, health departments, and physician offices) … supervised by a health care provider who can recognize and manage severe allergic conditions.

3. A previous severe allergic reaction to influenza vaccine, regardless of the component suspected of being responsible for the reaction, is a contraindication to future receipt of the vaccine.

## Timing of Vaccination

- Vaccination should occur before onset of influenza activity. Health care providers should offer vaccination by the end of October, if possible.
- Children aged 6 months through 8 years who require 2 doses should receive their first dose as soon as possible after vaccine becomes available, and the second dose ≥4 weeks later.
- Vaccination should continue to be offered as long as influenza viruses are circulating and unexpired vaccine is available.
- To avoid missed opportunities for vaccination, providers should offer vaccination during routine health care visits and hospitalizations when vaccine is available.

## CDC website on influenza: http://www.cdc.gov/flu/index.htm


## Adult Immunization

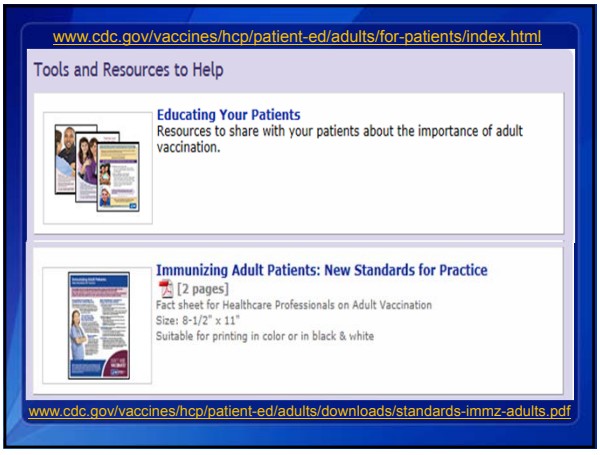
## Burden of Disease Among U.S. Adults for Vaccine-preventable Diseases

- **Influenza disease burden varies year to year**[1]
  - Millions of cases and average of 226,000 hospitalizations annually with more than 75% among adults
  - 3,000-49,000 deaths annually, more than 90% among adults
- **Invasive pneumococcal disease (IPD)**[2] **-** 13,000 invasive pneumococcal disease cases among adults 65 and older in 2013
- **Pertussis**[3] **– 32, 971** total reported cases 2014 (~8,000 among adults)
- **Hepatitis B**[4] **-** 3,350 acute cases reported 2010
- **Zoster**[5] **-** ~1 million cases annually

[1]CDC. Estimates of deaths associated with seasonal influenza United States, 1976-2007. *MMWR*. 2010; 59(33):1057-1062.
[2]CDC. Active Bacterial Core Surveillance. www.cdc.gov/abcs/reports_findings/survreports/spneu13.pdf
[3]CDC. MMWR January 9, 2015 / 63(53);ND-733-ND-746. (MMWR 2014 provisional week 53 data)
[4]CDC. Viral Hepatitis Surveillance United States, 2010. National Center for HIV,AIDS, Viral Hepatitis, STD&TB Prevention/Division of Viral Hepatitis.
[5]CDC. Prevention of Herpes Zoster. *MMWR* 2008.57(RR 5):1-30.


## Implementing Adult Immunization Standards

- **Assess**
  - Provider reminders in the record
  - Immunization coverage reports
  - Identify patients who are not current
- **Recommend**
  - Make it a standard of care to provide all ACIP recommended vaccines
- **Administer/Refer**
  - Standing orders
  - Expanding access – nurse only visits, pharmacy visits, walk-in visits, extended clinic hours
- **Document**
  - Critical for accurate reminders, monitoring coverage, reminder recall notices to patients who are due



## The New Pink Book Now Available

- 13th Edition (2015)
- Available on online – view, print or download.
- Bound copies may be purchased.


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

## CDC Vaccines and Immunization Resources

- Questions? E-mail CDC
  - nipinfo@cdc.gov or www.cdc.gov/cdcinfo

| | |
|---|---|
| Website | www.cdc.gov/vaccines |
| HCP | www.cdc.gov/vaccines/hcp |
| Twitter | @CDCIZlearn |
| Influenza | www.cdc.gov/flu |
| Vaccine Safety | www.cdc.gov/vaccinesafety |