

Current recommendation for adult immunization: An update

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Introduction

Vaccines received as children will not protect adult for the rest of their lives. New vaccines such as the chickenpox vaccination were not available when many adults were children. And vaccinations for certain diseases must be repeated periodically to maintain immunity. In addition, certain vaccines are given to adults but not children. This is because with aging, we become more susceptible to serious diseases caused by common infections (such as flu or pneumonia).

The standards of vaccination among adults are less clear-cut due to the lack of a widely publicized and universally practiced comprehensive vaccination schedule. Adulthood encompass all age groups from 18 years and beyond, which can span 6 decades or more. In this wide age range, individuals have a wide variety of past and present medical histories, behavioural and occupational risks, and psychosocial and cultural backgrounds. This results in a wide range of risk levels for various infectious diseases in the general adult population, which makes routine vaccination of all vaccine-preventable diseases for all adults inappropriate and inefficient.

Several health initiatives currently focus on reducing vaccine preventable diseases throughout the world. Although immunization has become the core of paediatric practice, it has not been well integrated into routine health-care visits of for adults. Seventeen diseases are now preventable through vaccines routinely administered to children and adults.

Specific vaccines may blunt the severity of clinic illness or reduce complications. Some immunization also reduces transmission of infectious disease agents from immune persons to others; thereby reducing the impact of infection spread.

The following are the recommendations for vaccination.

Adults 19 – 26 years old: In addition to seasonal flu (influenza) vaccine and Td or Tdap vaccine (Tetanus, diphtheria, and pertussis), they should also get:

1. HPV vaccine which protects against the human papillomaviruses that causes most cervical cancers, anal cancer, and genital warts. It is recommended for:
 - women up to age 26 years
 - men up to age 21 years
 - men ages 22-26 who have sex with men

Pregnant Women: The two vaccines which are needed during each pregnancy are:

- **Tdap (preferably between 27 and 36 weeks of pregnancy)** to help protect against whooping cough, and
- **The flu shot (during flu season, which is October through May)** to help protect against influenza.

Healthcare Workers: Healthcare workers (HCWs) are at risk for exposure to serious, and sometimes deadly, diseases. If they work directly with patients or handle material that could spread infection, they should get appropriate vaccines to reduce the chance that they will get or spread vaccine-preventable diseases.

In addition to seasonal flu (influenza) vaccine and Td or Tdap vaccine (Tetanus, diphtheria, and pertussis), they should also get:

- **Hepatitis B:** If they don't have documented evidence of a complete hep B vaccine series, or if they don't have an up-to-date blood test that shows they are immune to hepatitis B (i.e., no serologic evidence of immunity or prior vaccination) then they should get the 3-dose series. Get anti-HBs serologic tested 1–2 months after dose #3.
- **MMR (Measles, Mumps, & Rubella):** If they were born in 1957 or later and have not had the MMR vaccine, or if they don't have an up-to-date blood test that shows they are immune to measles, mumps, and rubella (i.e., no serologic evidence of immunity or prior vaccination), get 2 doses of MMR, 4 weeks apart.
- **Varicella (Chickenpox):** If they have not had chickenpox (varicella), if they haven't had varicella vaccine, or if they don't have an up-to-date blood test that shows they are immune to varicella (i.e., no serologic evidence of immunity or prior vaccination) get 2 doses of varicella vaccine, 4 weeks apart.
- **Meningococcal:** Those who are routinely exposed to isolates of *N. meningitidis* should get one dose.

The latest recommendation for adult vaccination is **The Recommended Adult Immunization Schedule:** United States, 2016.

It has been **released by the Advisory Committee on Immunization Practices (ACIP)**, published in the *Annals of Internal Medicine*.⁽¹⁾

What is New

It contains **several changes from past years**, including:

- The addition of recently licensed meningococcal serogroup B
- Human papillomavirus vaccines
- A revision to the recommendation for pneumococcal vaccination.

New recommendations have been added for use of two recently licensed serogroup meningococcal B vaccines: *Trumenba* (Wyeth Pharmaceuticals), licensed in October 2014, and *Bexsero* (Novartis), licensed in January 2015.⁽¹⁾

A new row had been added to the chart for the "MenB" vaccine series, which should be administered to certain groups of persons aged 10 years and older who are at increased risk for serogroup B meningococcal disease. The Men B series can also be given to adolescents and young adults aged 16 through 23 years (preferred age is 16 - 18 years) to provide short-term protection against most strains of serogroup B meningococcal disease.

For human papillomavirus immunization, the new vaccine nomenclature has been changed to "9vHPV," to denote Merck's *Gardasil 9*, which was licensed in December 2014 to replace the prior 4-valent version. 9vHPV has been added to the adult schedule and can be used for routine vaccination of females and males against HPV.

For pneumococcal immunization, the interval recommendation has been changed between receipt of the 13-valent pneumococcal conjugate vaccine followed by 23-valent pneumococcal polysaccharide vaccine from "6 to 12 months" to "at least 1 year" for immunocompetent adults aged 65 years and older.

For adults aged 19 years or older who have immunocompromising conditions, anatomic or functional asplenia, cerebrospinal fluid leak, or cochlear implants, that interval is at least 8 weeks. The following are some more informations about the changes.

HPV Vaccination

The new schedule addresses how to prescribe the new 9-valent HPV vaccine (which covers five additional virus strains linked to 10% of HPV-related cancers overall, more in women than in men). Any of the three vaccines (the 2-, 4-, or 9-valent vaccines) can be used for females, but only the 4- and 9-valent vaccines should be used for males. Three HPV vaccine doses are recommended routinely starting at age 11 or 12. Vaccinate through age 26 for all females, through age 21 for all males, and through age 26 for immunocompromised males, including those with HIV and men who have sex with men. Pay close attention to the minimum intervals between vaccine doses.

"There is no ACIP recommendation for routine additional 9-valent HPV vaccination for anyone who has already completed a bivalent or quadrivalent vaccination series. Studies show no serious safety concerns with additional 9-valent vaccination. However, there may be higher rates of injection site swelling and redness."⁽²⁾

Pneumococcal Vaccination

The US Food and Drug Administration (FDA) has approved only two pneumococcal vaccines for adults: conjugate PCV13 (Prevnar®) and polysaccharide PPSV23 (Pneumovax®). They work in different ways. The two pneumococcal vaccinations should not be given at the same time. Timing, order, and interval between vaccinations matter.

Here is the major change for pneumococcal vaccination: **The new schedule** aligns intervals between vaccinations with ACIP's latest evidence-based recommendations. For most healthy adults, the interval for PCV 13 and then PPSV23 has been extended to at least a year.⁽³⁾

However, the ACIP-recommended interval for PCV13 and then PPSV23 for adults of all ages with immunocompromising conditions, cerebrospinal fluid leaks, or cochlear implants, has not changed. It's still at least 8 weeks.

For patients who need both, PCV13 should be given first. However, if PPSV23 is given first, ACIP still says to wait at least a year before giving PCV13. The interval of 5 years between PPSV23 vaccinations for those needing revaccination has also not changed.

Meningococcal Vaccination

There are two rows on the graphic: a row for the older meningococcal vaccines covering A, C, W, and Y and a new row for the new meningococcal B vaccines. The products are not interchangeable and the same product has to be used to complete the two- or three-dose series. The brand names (*Trumenba*® and *Bexsero*®) are used in the footnote to help clear up confusion.

Serogroup B meningococcal (Men B) vaccine series should be administered to persons aged ≥ 10 years who are at increased risk for serogroup B meningococcal disease.⁽⁴⁾ Those at increased risk include persons with anatomical or functional asplenia or persistent complement component deficiencies, microbiologists who are routinely exposed to isolates of *Neisseria meningitidis*, and persons identified at increased risk because of a serogroup B meningococcal disease outbreak. Men B vaccine series may be administered to adolescents and young adults aged 16 through 23 years (preferred age is 16 through 18 years) to provide short-term protection against most strains of serogroup B meningococcal disease.⁽³⁾

Both vaccines may be given at the same time on the same day but at different anatomic sites.

Zoster vaccination

A single dose of zoster vaccine is recommended for adults aged ≥ 60 years regardless of whether they report a prior episode of herpes zoster. Although the vaccine is licensed by the U.S. Food and Drug Administration for use among and can be administered to persons aged ≥ 50 years, ACIP recommends that vaccination begin at age 60 years.

Immunocompromising conditions

Inactivated vaccines (e.g., pneumococcal, meningococcal, and inactivated influenza vaccines) generally are acceptable and live vaccines generally should be avoided in persons with immune deficiencies or immunocompromising conditions.

Should not get vaccine (*Zoster*, *Varicella* and MMR)

Pregnancy, Weakened Immune System and HIV: CD4 count less than 200.

Recommended immunization schedule for adults aged 19 years or older, by vaccine and age group ¹							
Vaccine	Age in years →	19-21	22-26	27-49	50-59	60-64	≥ 65
Influenza		1 dose Annually					
Tetanus, diphtheria, pertussis (Td /Tdap)		Substitute Tdap for Td once, then Td booster every 10 yrs					
Varicella		2 Doses					
Human papillomavirus (HPV) Female		3 doses					
Human papillomavirus (HPV) Male		3 doses					
Zoster						1 dose	
Measles, mumps, rubella (MMR)		1 or 2 doses depending on indication					
Pneumococcal 13-valent conjugate (PCV13)						1 dose	
Pneumococcal 23-valent polysaccharide (PPSV23)		1 or 2 doses depending on indication					1 dose
Hepatitis A		2 or 3 doses depending on vaccine					
Hepatitis B		3 doses					
Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4)		1 or more doses depending on indication					
Meningococcal B (MenB)		2 or 3 doses depending on vaccine					
<i>Haemophilus influenzae</i> type b (Hib)		1 or 3 doses depending on indication					

Table modified from - Recommended Immunization Schedule for Adults Aged 19 Years or Older: United States, 2016.⁽¹⁾

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

The adult immunization schedule describes certain conditions that might cause altered immunocompetence, such as anatomical or functional asplenia and the use of immunosuppressive drugs, as indications or contraindications for specific vaccines.

The ACIP also recommends that women who are or will be pregnant during the influenza season be vaccinated to protect themselves and their newborns. In addition, tetanus–diphtheria–acellular pertussis (Tdap) vaccination is recommended for pregnant women during each pregnancy, preferably during 27 to 36 weeks' gestation, regardless of her history of receiving tetanus–diphtheria (Td) or Tdap vaccines.

Thus, obstetrician-gynecologists, pulmonologists, nephrologists, cardiologists, and other clinical

specialists who provide care for these at-risk adult populations have the responsibility, as do their primary care colleagues, to assess for and recommend vaccines their patients need, and either administer the needed vaccines or refer them to a place where they can get the recommended vaccines. Recently, the authors of 2 published meta-analyses described an association between influenza vaccination and lower risk for cardiovascular events among patients with existing cardiovascular disease. They concluded that physicians should be aware of the need to offer influenza vaccination to patients with cardiovascular disease and that cardiologists should offer vaccination to their patients as “a simple once-annual protective therapy to reduce cardiovascular events”.⁽⁶⁾

References

1. Kim DK, Bridges CB, Harriman KH, on behalf of the Advisory Committee on Immunization Practices. Advisory Committee on Immunization Practices Recommended Immunization Schedule for Adults Aged 19 Years or Older: United States, 2016. *Ann Intern Med.* 2016;164:184-194.

2. Petrosky E, Bocchini JA, Hariri S et al. Centers for Disease Control and Prevention (CDC) Use of 9-valent human papillomavirus (HPV) vaccine: updated HPV vaccination recommendations of the advisory committee on immunization practices. *MMWR Morb Mortal Wkly Rep*.2015;64:300-4.
3. Kobayashi M, Bennett NM, Gierke R, et al. Intervals between PCV13 and PPSV23 vaccines: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Morb Mortal Wkly Rep*2015;64:944-7.
4. Folaranmi T, Rubin L, Martin SW, Patel M, MacNeil JR Centers for Disease Control (CDC)Use of serogroup B meningococcal vaccines in persons aged ≥ 10 years at increased risk for serogroup B meningococcal disease: recommendations of the Advisory Committee on Immunization Practices, 2015.*MMWR Morb Mortal Wkly Rep*2015;64:608-12.
5. MacNeil JR , Rubin L, Folaranmi T, Ortega-Sanchez IR, Pate IM, Martin SW. Use of serogroup B meningococcal vaccines in adolescents and young adults: recommendations of the Advisory Committee on Immunization Practices, 2015.*MMWR Morb Mortal Wkly Rep*2015;64:117-16.
6. Barnes M, Heywood AE, Mahimbo A, Rahman B, Newall AT, Macintyre CR. Acute myocardial infarction and influenza: a meta-analysis of case-control studies. *Heart*. 2015;101:1738-47.