



Adult Vaccinations

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A Review for the Primary Care Physician

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Introduction

Vaccine Disparities

Disparities in Adult Vaccinations

While a big push has been made to improve childhood vaccination rates, adult vaccination remains poor. According to the National Center for Immunization and Respiratory Diseases, vaccine preventable deaths kill more Americans every year than either traffic accidents, breast cancer, or HIV/AIDS.¹ For this reason, primary care physicians need to assume responsibility for developing new strategies to improve adult immunization rates.

According to the National Immunization Survey released by the CDC in 2007⁵:

Only 2.1% of eligible adults had received the Tdap in the previous two years

Less than 2% of patients over the age of 60 had received the shingles vaccine

Only 20% of eligible adult women had received the HPV vaccine series

Only 36.1% adults are vaccinated annually for the seasonal flu

Only 66.9% of eligible patients had received the pneumococcal vaccine

Vaccine Hesitancy

“Vaccination is the victim of its own success”

Because vaccine preventable diseases are now less visible, both patients and healthcare providers are naive to the risks associated with these diseases. Instead they are directly exposed to the perceived risks of the vaccines.

There is a new concept of “vaccine hesitancy” in our society where vaccines are perceived as unsafe and unnecessary. This belief is driving poor adult vaccination rates. Health care professionals ought to focus on their role in addressing vaccine hesitancy. In a Canadian survey of over 4000 adults, between 55% and 59.7% of adults were willing to be vaccinated if recommended by their healthcare provider.² Research shows that health professionals’ knowledge of vaccines “has been shown to be an important determinant of their own vaccine uptake, their intention to recommend the vaccine to their patients, and the vaccine uptake of their patients.”³ This resource is aimed to provide concise and high yield vaccine education for primary care physicians in order to improve vaccine uptake among their patients.

Disclaimer

Every year vaccine guidelines are updated! Refer to Advisory Committee on Immunization Practices (ACIP) on the CDC website for yearly changes in vaccine guidelines

<http://www.cdc.gov/vaccines/acip/>

This resource is meant to be high yield but not comprehensive. Refer to CDC guidelines for more specific questions or clarifications.

It is important to know contraindications/precautions but these should not be the main focus. A contraindication to ALL vaccines is severe allergic reaction (anaphylaxis) after a previous dose OR to any vaccine component. A precaution to ALL vaccines is moderate or severe acute illness (+/- fever). If there are additional contraindications/precautions they will be noted at the bottom of each vaccine page.

Universal Vaccines

Influenza

Tdap/Td

Pneumococcal

Zoster

Influenza

There are 30,000-50,000 deaths annually in the US from influenza and greater than 200,000 associated hospitalizations. Barriers to Adult Vaccinations, a study that surveyed approximately 2000 consumers, found that 43% cited concern about side effects as their reason for avoiding vaccination. An additional 18% reported they feared they may get the disease.⁴ As primary care providers we must provide our patients with basic vaccine education to combat vaccine myths.

What to know in clinic:

EVERYONE over 6 months should get the flu shot EVERY year

There are various trade names and manufacturers but just know the broad categories

Inactivated influenza vaccines (IIV):

- 6 months to age 65 get Trivalent (IIV) or Quadrivalent (IIV4)
- No current data on which to recommend

High dose IIV:

- Age 65+ population

Egg free options:

- cc-IIV is a cell culture vaccine approved in 2013
- RIV is a recombinant HA vaccine approved in 2013

Live-attenuated influenza vaccine (LAIV):

- Nasal formulation (Quadrivalent)
- Healthy people 2-49 years
- NOT for immunocompromised adults, pregnant women, anyone

- receiving antiviral medications within 48 hours
- If health care persons receive LAIV they should avoid caring for
- severely immunosuppressed patients for 7 days follow vaccination

Adverse Reactions: Fever, tiredness, muscle aches, headaches, arm soreness

Precautions: History of GBS within 6 weeks of influenza vaccination, adults with egg allergy may receive RIV or cc-IIV, adults with “hives only” egg allergy may receive IIV

Tdap/Td

Over 50% of adults do not have protective tetanus or diphtheria antibodies, meaning most adults are not receiving routine Td boosters. Some insurances (including Medicare) will only pay for boosters to be given following trauma wounds. It is important to know the indications for Td in the setting of trauma but patients with insurance coverage should receive Td boosters every 10 years.

Pertussis incidence had been increasing since the 1970s. In 2012 there were over 42,000 cases reports in the US alone.⁵ Therefore, the ACIP now recommends replacing one dose of Td with Tdap in all adults. This is especially important in adults with close infant contact, healthcare workers, parents, and those in the childcare settings.

What to know in clinic:

Give Td booster every 10 years

Substitute Tdap for Td once (within primary series or as a booster)

If vaccine status unknown, given Tdap followed by Td every 10 years

Pregnant women get Tdap every pregnancy regardless of last Td/Tdap

No contraindications for immunocompromised host

Update primary series in unvaccinated adults: Give all 3 doses (0, 1 month, 6-12 months)

Contraindications: Encephalopathy not attributable to another cause within 7 days of previous pertussis dose.

Precautions: History of GBS within 6 weeks after previous tetanus dose, history of Arthus-type hypersensitivity rxns after previous tetanus/diphtheria dose, progressive or unstable neurological disorder or seizures should have pertussis vaccine delayed until treatment regimen established or condition stabilized

Pneumococcal

Only 20% of high risk adults ages 19 to 49 receive PPSV23 and PCV13. Vaccine rates for those over age 65 are approximately 60%.⁵ This difference is significant and might stem from confusion among primary care physicians about when pneumococcal vaccination is indicated. Indications for pneumococcal vaccination before age 65 can be confusing. Some details are worth committing to memory but refer to the ACIP guidelines when further clarification is needed.

What to know in clinic:

There are 2 vaccines: Prevnar 13 (PCV13) and Pneumovax 23 (PPSV23)

In their lifetime adults should get 1 dose of PCV13 and 1-3 doses of PPSV23 (depending on circumstances)

NEVER give PCV13 and PPSV23 at the same visit

Usually give PCV13 first (if neither have been given)

Generally PCV13 and PPSV23 should be given 1 year apart (exception: only wait 8 weeks after PCV13 to give PPSV23 if immunocompromised)

The interval between repeat PPSV23 doses is at least 5 years

Specific details for determining how to vaccinate:

Immunocompetent adults > 65

- Never received PCV13 or PPSV23: PCV13 followed by PPSV23 1 year later
- Already received PPSV23 after 65: Wait 1 year and give PCV13
- Already received PCV13 after 65: Wait 1 year and give PPSV23
- Received PCV13 before age 65: Still wait at least 1 year before giving PPSV23
- Received PPSV23 before age 65: Give a second dose 5 years following prior dose of PPSV23

Anatomical/functional asplenia and immunocompromised adults >19

- Ideally: PCV13 followed by PPSV23 in 8 weeks followed by PPSV23 in 5 years. Give third dose of PPSV23 after age 65
- If they received PPSV23 initially they still need PCV13 and repeat PPSV23 but keep in mind timing of when these can be given

Immunocompromised hosts include those with congenital/acquired immunodeficiency, HIV, CKD, nephrotic syndrome, leukemia, lymphoma, Hodgkin disease, generalized malignancy, multiple myeloma, solid organ transplant, and iatrogenic immunosuppression (including long-term systemic corticosteroids and radiation)

Adults with chronic diseases age 19-64

- Give PPSV23
- At age 65 given PCV13 (at least 1 year after PPSV23 given) followed by PPSV23 (at least 1 year after PCV13 and at least 5 years after last dose of PPSV23)

Chronic disease include those with CHF/cardiomyopathy, COPD, asthma, chronic liver disease/cirrhosis, alcoholism, diabetes mellitus, tobacco abuse

Zoster

One of three adults over the age of 60 will get shingles. Shingles is caused by the same virus that causes chickenpox, but having had chickenpox does not provide immunity to shingles. Since 2006 the shingles vaccine known as Zostavax has been available. It reduces the risk of shingles by 51%. There is collateral benefit from the vaccine as it reduces the risk of developing post-herpetic neuralgia by 67%.⁵ Post-herpetic neuralgia can be debilitating and there is no current treatment for this pain.

What to know in clinic:

Recommended over age 60 by the ACIP

Approved over age 50 by the FDA

Very expensive so often insurance won't pay until age 60

Contraindicated in pregnancy, immunocompromised state, HIV (Remember, zoster is a live vaccine)

If patients have had Zoster, they can and should still get the vaccine

Adverse reactions: Occasional mild varicella like rash at the vaccine site

Contraindications: Known severe immunodeficiency, pregnancy

Precautions: Recent receipt of antibody-containing blood product, history of thrombocytopenia or thrombocytopenia purpura, need for tuberculin skin testing

Selective Vaccines

HPV

MMR

Hepatitis A

Hepatitis B

Meningococcal

HPV

In February of 2014 the ACIP approved the 9-valent HPV (9vHPV) vaccine in addition to the two HPV vaccines previously used (2vHPV and 4vHPV). All three vaccines target HPV 16 and 18 which lead to 66% of cervical cancers in the US. Additionally, the 9vHPV targets HPV 31, 33, 45, 52, 58 (which lead to an additional 15% of cervical cancers). 4vHPV and 9vHPV also target HPV 6 and 11 which are responsible for anogenital warts.

ACIP recommends that a vaccine series started with 2vHPV or 4vHPV be completed with 9vHPV. However, there is no ACIP recommendation for additional 9vHPV vaccination if a 3 dose series was previously completed.⁶

What to know in clinic:

HPV vaccine does not clear HPV already present

Women should still get cervical cancer screening at age 21

Females: All three vaccines, age 13-26

Males: 4vHPV & 9vHPV, age 13-21 (MSM through age 26)

*Vaccination is permitted in males age 21-26 with no other risks but is not considered routine

Can be given when immunocompromised, but not pregnant

Series Timeline: 4vHPV & 9vHPV (0, 2, 6 months), 2vHPV (0, 1, 6 months)

MMR

In 2014 the US experienced a record number of measles outbreaks with 667 cases among 27 states. This was the largest number of cases reported since measles was said to be “eliminated” in 2000. Subsequently in 2015 the US experienced a multi-state measles outbreak with 189 cases report among 24 states.⁵ For this reason it is important to ensure adults have been vaccinated with at least one dose of MMR. You should also consider post-exposure prophylaxis within 72 hours for anyone exposed to measles virus.

What to know in clinic:

Adults born before 1957 are considered immune and don't need vaccinated

Adults born after 1957 need documentation of >1 dose of MMR vaccine (documentation of provider-diagnosed disease is not acceptable)

If unvaccinated adults, give at least 1 dose of MMR. Give a second dose 1 month later if adults are students in postsecondary educational institutions, work in a healthcare facility, plan to travel internationally

Rubella immunity should be determined in women of childbearing age. If no immunity non-pregnant women should be vaccinated

Contraindications: Pregnancy, known severe immunodeficiency

Precautions: Recent recipient of antibody containing blood products, history of thrombocytopenia or thrombocytopenia purpura, need for TB skin testing

Hepatitis A

In 2006 Hepatitis A vaccination was incorporated into the routine childhood vaccination schedule. Therefore many adults did not receive the Hepatitis A vaccine as a child. There are specific groups that should be vaccinated as adults so be familiar with the list below. Keep in mind that post-exposure prophylaxis for HAV is available. Unvaccinated individuals who are exposed to HAV should receive a single-antigen HAV vaccine or immune globulin within two weeks of the exposure.

What to know in clinic:

Administer missing doses to complete a 2 dose series (0, 6 months)

If the immunization schedule is interrupted the 2nd dose can be given without restarting the series.

Anyone can be vaccinated but specific indications include the following:

- current or recent injection drug users
- men who have sex with men
- those working with HAV-infected primates or with HAV in lab
- chronic liver disease
- those receiving clotting factor concentrates
- travelers to regions of high endemic HAV infection
- close contact with international adoptee during first 60 days of arrival to US from high endemic HAV country
- adults in the following settings: STD treatment, HIV testing/treatment, drug abuse treatment/prevention, correctional facilities, ESRD programs, developmental disability facilities

Hepatitis B

In October of 2011 the ACIP began recommending Hepatitis B vaccine in non-immunized diabetic patients under the age of 60.⁶ Patients with diabetes have greater than two fold increased risk of developing acute HBV when compared to non-diabetic patients. Diabetics are also more likely to develop NASH which increases morbidity and mortality associated with HBV. Despite these guidelines, screening for Hepatitis B is often missed in the primary care setting. Therefore physicians need to make a practice of screening for Hepatitis B vaccination especially in diabetic patients.

What to know in clinic:

Administer missing doses to complete a 3 dose series (0, 2, 4 months)

If the series is delayed, complete the series from prior dose

Check a titer 1 month after a 3 dose series, repeat series if <10 IU

Anyone can be vaccinated but specific indications include the following:

- sexually active patients not in long-term monogamous relationship
- patients seeking evaluation for STDs
- current or recent injection drug users
- men who have sex with men
- health care personnel potentially exposed to blood or body fluids
- diabetics <60 (under physician discretion when over age 60)
- ESRD, chronic hemodialysis patients
- chronic liver disease
- HIV
- household contacts and sexual partners of Hep B surface Ag positive persons

- travelers to regions of high endemic HBV infection
- adults in the following settings: STD treatment, HIV testing/treatment, drug abuse treatment/prevention, correctional facilities, ESRD programs, developmental disability facilities

Meningococcal

While rates of meningococcal disease have been declining in the US, there were approximately 550 reported cases in 2013.⁵ Disease rates are highest in children and young adults ages 16 to 23. Think about vaccination if your patients are military recruits, college students, travelers, have had exposure to outbreaks, have asplenia or complement deficiencies, or are microbiologists.

In 2014 two serogroup B meningococcal vaccines were approved for use in adults ages 10 to 25. It is now recommended for those at increased risk for serogroup B meningococcal disease. No revaccination is needed.

What to know in clinic:

There are 3 vaccines for adults: Quadrivalent vaccine (MenACWY), Polysaccharide vaccine (MPSV4), Serogroup B vaccine (MenB)

MenACWY is given more often.

Use MPSV4 for unvaccinated adults over age 56 requiring 1 dose of the vaccine. Otherwise use MenACWY

MenB is used for those over age 10 at increased risk for serogroup B meningococcal disease

Refer to specific indications on the following page.

Specific indications:

Military recruits: Give 1 dose of MenACWY vaccine

1st year college students living in dorms (who didn't receive a vaccine after age 16): Give 1 dose of MenACWY

Persons traveling to countries where disease is common: Give 1 dose of MenACWY and revaccinate every 5 years while still at risk

Persons at risk because of an outbreak: Give 1 dose of MenACWY/MPSV4 unless the outbreak is attributed to serogroup B then give a series of MenB

Adults with anatomical or functional asplenia or complement deficiencies: Give 2 doses of MenACWY (2 months apart) and revaccinate every 5 years. They should also receive MenB.

Microbiologist exposed to *Neisseria meningitidis*: Give 1 dose MenACWY and revaccinate every 5 years. They should also receive MenB.

References

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