

Barriers to Adult Immunizations

Getting from “No!” to “Yes!”



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Learning Objectives

- Identify barriers to immunizations among adults
- Use evidence-based recommendations and guidelines to establish standardized vaccine administration procedures, including standardized protocols to screen for immunizations during patient encounters
- Identify available vaccine administration strategies and resources, available patient education resources, vaccine alert systems, current immunization schedules, and available education programs
- Counsel patients using available patient education resources and motivational interviewing about vaccine safety and efficacy

Pre-Assessment

Please complete your answers
on the sheet provided in your syllabus.

Pre-Assessment Question #1

Regarding adult immunizations, which of the following statements is true?

- A. The Advisory Committee on Immunization Practice recommends HPV vaccine may be used in women up until age 26 and in men up until age 21.
- B. The Advisory Committee on Immunization Practice currently recommends one dose of Zostavax at age 50.
- C. The minimum recommended interval by the Advisory Committee on Immunization Practice to administer a Tdap after having had a Td is 24 months.
- D. The Advisory Committee on Immunization Practice states that individuals who have experienced only hives after egg exposure should receive the Influenza Vaccine.

Pre-Assessment Question #2

Each of the following individuals would receive a single dose of PCV 13 followed by a dose of PPSV 23 at least 8 weeks later **EXCEPT**:

- A. Individual with a cochlear implant
- B. Individual with functional asplenia
- C. Individual with cirrhosis
- D. Individual with a CSF leak

Pre-Assessment Question #3

Key recommendations for practice in examining immunizations in adults include which one of the following?

- A. Vaccinating adults against pertussis, especially those in high-risk groups, increases the risk of disease outbreaks
- B. Annual influenza vaccination is recommended for only persons older than 24 months
- C. The quadrivalent human papillomavirus vaccine may be considered in males and females to prevent genital warts and cervical and anal cancers
- D. Vaccination against herpes zoster is most effective when given as early as possible after 50 years of age

SORT

Strength of Recommendation Taxonomy

- **Category A:** Recommendation based on consistent and good-quality patient oriented evidence.
- **Category B:** Recommendation based on inconsistent or limited quality patient-oriented evidence.
- **Category C:** Recommendation based on consensus, usual practice, opinion, disease-oriented evidence-based series for studies of diagnosis, treatment, prevention, or screening

Background

- Vaccines are considered one of the greatest public health achievements of the last century for their role in -
 - Eradicating smallpox
 - Controlling polio, measles, mumps, rubella and other infectious diseases
- Despite their effectiveness in preventing and eradicating disease, substantial gaps in vaccine uptake persist
- **Good News** – Vaccination rates for young children are high
- **Bad News** – Vaccination rates remain well below established Healthy People 2020 targets for many vaccines recommended for adolescents, adults, and pregnant women

Vaccination Coverage in Adults*

CDC. Non-influenza vaccination coverage among adults: United States, 2012. MMWR Morb Mortal Wkly Rep. 2014;63 (5):95-102.

***NOTE: Children's vaccination coverage is about 90%.**

Vaccine	2012 Coverage	Health People 2020
Tdap (ages 19-64)	12.5% (Healthcare workers (26.8%))	–
Herpes zoster	15.8%	30%
HPV Women ages 19-26 ≥ 1 Men ages 19-26 ≥ 1	29.5% < 3%	–
Pneumococcal Ages 19-64 Age > 65	20.1% 62.3%	60% 90%
Hepatitis B High risk, ages 19-49 Ages 19-59 with diabetes Healthcare professionals	42% 22.8% 63.8	90% – –
Hepatitis A (ages 19-49)	10.7%	–
Influenza ≥ 6 m of age 65 y of age Pregnant women Healthcare providers	42.8% 68.6% 47% 72%	80% 80% 90%

Gaps in Vaccine Utilization and American Healthcare

- Financial burden of vaccine-preventable diseases among adults – 10 billion annually
- Public health burden is equally heavy
 - Annually on average, 50,000 adults die from vaccine-preventable diseases or their complications*
 - These figures would be greatly reduced with vaccinations

* National Foundation for Infectious Disease. Facts about immunization. August 2009. Available at: <http://www.nfid.org/publications/factsheets/adultfact.pdf>

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- Despite their effectiveness in preventing and eradicating disease, substantial gaps in vaccine uptake persist
- Good News – Vaccination rates for young children are high
- Bad News – Vaccination rates remain well below established Healthy People 2020 targets for many vaccines recommended for adolescents, adults, and pregnant women
- Understanding why our patients respond with “No thanks!” rather than “Of course!” when we offer vaccinations and effectively communicating the risks and benefits of vaccination are important parts of this effort.

State of Adult Immunization

- Twelve vaccines are available for adults, all of which should be considered when providing healthcare to adults
- Universal vaccination among any group of people promotes a healthy society, increasing productivity and decreasing (worker) absenteeism
- Vaccinating adults protects young children, those with immunodeficiencies, and those who cannot be vaccinated
- Clinicians must educate themselves on applicable adult vaccines so they can make valid recommendations to patients

Who Most Influences Adults' Decisions to Get Immunized?

Who	Percentage
Personal physician	69%
Family member	19%
Celebrity physician, public figure, other	7%
None of the above	4%
No answer	1%

Source: National Foundation for Infectious Diseases. 2009 National Adult Immunization Consumer Survey. In: Landers SJ. Physicians asked to persuade adults to get immunized. *American Medical News*. 2009. Available at: <http://amednews.com/article/20090803/profession/308039978/7/>.

What Are We Up Against?

- Misinformation about vaccines
 - Falsehoods, once made public, are difficult to counter
 - Loudly stated misinformation overshadows complex, multisource scientific data in the minds of American people, and the information sticks
- Research has documented public skepticism regarding vaccine safety

Barriers

2011 AAFP Immunization Survey

Practice level

- Cost (51%)
 - Lack of insurance coverage
- Patient acceptance (33%)
 - Fear of needles
 - Side effects
- Supply (30%)

Patient level

- Safety (58%)
- Personal or religious beliefs (53%)
- Cost (51%)

American Academy of Family Physicians (AAFP). 2011 AAFP Immunization Survey Summary of findings. Leawod KS: AAFP; 2012.

- *Organizational*
- *Sociological*
- *Operational*

BARRIERS

Barriers

- Organizational
 - Cost
 - Insurance coverage
 - Improving with healthcare reform
 - Competing demands
- Sociological
- Operational

Preventive Services in the Affordable Care Act

(Organizational - Cost)

- Address cost barriers
- Ensure access to preventive healthcare
- Law requires all new and non-grandfathered (plans created after 23 March 2010) private insurance plans to cover a wide range of preventive services WITHOUT copayments or other cost sharing requirements
- August 2012

Some Services Covered Under the Law

- All new health insurance plans must cover, without cost-sharing, preventive services derived from four sets of expert recommendations
 - Services given an “A” or “B” recommendation by the USPSTF
 - **All vaccinations recommended by the CDC ACIP**
 - A set of evidence-based services for infants, children, and adolescents based on guidelines developed by the AAP and the DHHS
 - Evidence-based preventive services for women recommended by the IOM and supported by HRSA

Barrier

(Organizational – Competing Demands)

- Limited time during office visits to address medical problems and routine health maintenance
- Forget (or choose not to discuss) immunizations during sick visits
- Unlike childhood vaccinations (based primarily on age and vaccination history), decisions about adult vaccinations often must take into account comorbid medical conditions

Barriers

- Organizational
- Sociological
 - Socioeconomic disadvantage
 - Low patient health literacy
 - Understanding of vaccine safety and efficacy
- Operational

Barrier

(Sociological – Socioeconomic disadvantage)

- Lack access to adequate resources
- Lack access to adequate support
 - e.g., transportation

Barrier

(Sociological – Low patient health literacy)

- Poor communication can contribute to rejection of vaccinations and dissatisfaction with care
- Such poor communication often results from a belief by the health professional that vaccine refusal arises from ignorance, which can simply be addressed by persuading or providing more information
- Such an approach is counter-productive because it fails to account for the complexity of reasons underpinning vaccine refusal and may even result in a backfire effect

Lewandowsky S, Ecker UKH, Seifer CM, Schwarz N, and Cook J. Misinformation and its correction: continued influence and successful debiasing. Psychological Science in the Public Interest. 2012; 13:106-131

Addressing Concerns About Vaccination

Communication

Unhelpful

- *Directing style* – “*this is what you should do*”
 - Righting reflex – using information and persuasion to achieve change
 - Missing cues
 - Using jargon
 - Discrediting information source
 - Overstating vaccine safety
 - Confrontation

Helpful

- *Guiding style* – “*may I help you?*”
 - Care with body language
 - Eliciting concerns
 - Asking permission to discuss
 - Acknowledging/listening/empathizing
 - Determining readiness to change
 - Informing about benefits *and* risks
 - Giving or signposting appropriate resources

Barrier

(Sociological – Low patient health literacy)

- Poor communication can contribute to rejection of vaccinations and dissatisfaction with care
- Such poor communication often results from a belief by the health professional that vaccine refusal arises from ignorance, which can simply be addressed by persuading or providing more information
- Such an approach is counter-productive because it fails to account for the complexity of reasons underpinning vaccine refusal and may even result in a backfire effect
- Tailor messages on the basis of particular reasons for declination

Lewandowsky S, Ecker UKH, Seifer CM, Schwarz N, and Cook J. Misinformation and its correction: continued influence and successful debiasing. Psychological Science in the Public Interest. 2012; 13:106-131

What Do We Hear?

Patient	Response
“I can fight infection naturally – with good nutrition and hygiene.”	...and if you get it – there is no effective treatment for measles, mumps, or polio.
“My doctor didn’t recommend it.”	...nursing staff advise, physician then advises (I have had mine!).
“You gave me a flu shot and now I have the flu.”	...use the term “flu” only to describe an influenza infection, not a viral illness causing the common cold. Average patient suffers from 3-4 colds annually, is not unexpected that they might develop symptoms of a cold within weeks of an influenza vaccination – inappropriately attributed to the flu shot.
“It will make me or my child sick.”	In 2010, <i>The Lancet</i> retracted the now infamous 1998 article by Andrew Wakefield that described an erroneous association between MMR (measles, mumps, and rubella) vaccine and autism. Suspicion still abounds.

What Do We Hear?

Patient	Response
“Someone I respect recommended against it.”	A key way patients receive and share antivaccination information is through social media, such as Facebook, Twitter, or blogs. You can use your own social media accounts to offset that content with information favoring immunization. Here are some of the more trustworthy websites: • http://www.immunize.org • http://www.familydoctor.org • http://www.acponline.org • http://www.aap.org • http://www.medlineplus.gov • http://www.cdc.gov/vaccines/hcp/vis/index.html
“It’s a conspiracy.”	Historical unethical research practices and a source of mistrust toward physicians in some minority communities. e.g., Tuskegee experiment
“There is little threat of disease anymore.”	The CDC has a website (http://www.cdc.gov/vaccines/vac-gen/why.htm) aimed at parents, explaining the necessity to continue immunizing against diseases that are close to but not completely eradicated.

Barrier

(Sociological – Safety and efficacy)

- Safety
 - As the number of recommended immunizations has expanded across the population, so too have concerns about safety

Safety

Safety of Vaccines Used for Routine Immunization in the United States — 2011

AHRQ Evidence Report/Technology Assessment No. 215 – July 2014

www.ahrq/research/findings/evidence-based-reports/ptsafetyuptp.html

- Systematic Review of the literature of safety of vaccines
- 20,478 titles identified; 166 studies were accepted for abstraction
- Conclusions
 - Evidence that some vaccines are associated with serious adverse events
 - Events are RARE and must be weighed against the protective benefits

Strength of Evidence

AHRQ Evidence Report/Technology Assessment No. 215 (July 2014)

Vaccine	Associations	SOE
Influenza	• Arthralgia, myalgia, malaise, fever, pain at injection site • Lack of association with CV events in the elderly	High
Pneumococcal	• Lack of association with CV events in the elderly	High
MMR	• Febrile seizures in children under 5 • Lack of association with autism spectrum disorders	High
Varicella	• Lack of association with disseminated Oka strain VZV with associated complications (i.e., meningitis, encephalitis in individuals with demonstrated immunodeficiencies)	High
Rotavirus	• Intussusception in children (1-5 cases per 100,000 vaccine doses)	Mod
HPV	• Lack of association with JRA, type 1 DM, Guillain-Barre	Mod
Influenza	• No association between IIV and serious adverse events in pregnant women	Mod

Barriers

- Organizational
- Sociological
- Operational
 - Not stocking all recommended vaccines
 - Lack of standing orders
 - Lack of tracking systems (Immunization registries)
 - Leads to under- and over-vaccination

State Immunization Registry

- Information available at the American Immunization Registry Association Web Site
 - <http://www.immregistries.org/resources>
- Best possible scenario
 - National Immunization Registry

General Principles

Summary

- Successful dialogue
 - Take time to LISTEN
 - Solicit and welcome questions
 - Keep the language simple and uniform
 - Clear cohesive voice of vaccine safety
 - Keep the conversation going
- Every visit is an opportunity for primary prevention
- Trust develops when patients identify both competence and caring in their physician

SO GETTING TO TRUST...

Physician Knowledge

- Lack of knowledge of published preventive care guidelines
- Recommend, explain, and order the service
- Ambivalence
 - Scientific validity
 - Perception that service is clinically important

Current Adult Immunization Schedules

- Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention – develops a vaccination schedule for adults that is approved annually by the AAFP and other professional organizations
- Information about these schedules is available at <http://cdc.gov/vaccines>
 - Frequently monitor CDC websites for the most current recommendations
 - “CDC Vaccine Schedules” App
 - Optimized for tablets and useful on smartphones

2015 ACIP Adult Immunization Schedule

Recommended Adult Immunization Schedule—United States - 2015

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 adult immunization schedule, by vaccine and age group¹

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 1-time dose of Tdap for Td booster; then boost with Td 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					
Pneumococcal 13-valent conjugate (PCV13) ^{*,8}		1-time dose					
Pneumococcal polysaccharide (PPSV23) ⁸		1 or 2 doses					1 dose
Meningococcal ^{*,9}		1 or more doses					
Hepatitis A ^{*,10}		2 doses					
Hepatitis B ^{*,11}		3 doses					
<i>Haemophilus influenzae</i> type b (Hib) ^{*,12}		1 or 3 doses					

*Covered by the Vaccine Injury Compensation Program

 For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster

 Recommended if some other risk factor is present (e.g., on the basis of 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 American College of Physicians (ACP), American College of Obstetricians and Gynecologists (ACOG) and American College of Nurse-Midwives (ACNM).

2015 ACIP Adult Immunization Schedule

Figure 2. Vaccines that might be indicated for adults based on medical and other indications¹

VACCINE ▼	INDICATION ►	Pregnancy	Immuno-compromising conditions (excluding human immunodeficiency virus [HIV]) ^{4,6,7,8,13}	HIV infection CD4+ T lymphocyte count ^{4,6,7,8,13} < 200 cells/μL ≥ 200 cells/μL	Men who have sex with men (MSM)	Kidney failure, end-stage renal disease, receipt of hemodialysis	Heart disease, chronic lung disease, chronic alcoholism	Asplenia (including elective splenectomy and persistent complement component deficiencies) ^{8,12}	Chronic liver disease	Diabetes	Healthcare personnel
Influenza ^{*2}		1 dose IIV annually			1 dose IIV or LAIV annually	1 dose IIV annually				1 dose IIV or LAIV annually	
Tetanus, diphtheria, pertussis (Td/Tdap) ^{*3}	1 dose Tdap each pregnancy	Substitute 1-time dose of Tdap for Td booster; then boost with Td 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								
Pneumococcal 13-valent conjugate (PCV13) ^{*8}						1 dose					
Pneumococcal polysaccharide (PPSV23) ⁸						1 or 2 doses					
Meningococcal ^{*9}		1 or more doses									
Hepatitis A ^{*10}						2 doses					
Hepatitis B ^{*11}					3 doses						
Haemophilus influenzae type b (Hib) ^{*12}		post-HSCT recipients only	1 or 3 doses								

*Covered by the Vaccine Injury Compensation Program



For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster



Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)



No recommendation



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 ages 19 years and older, as of February 1, 2015. For all vaccines being recommended on the Adult Immunization Schedule: a vaccine series does not need to be restarted, 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 manufacturers' 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.

- Immunization series do not need to be restarted
- Breastfeeding is NOT a contraindication to vaccines

Quadrivalent (now 9 valent) HPV

Zostavax

Tdap

Influenza

Pneumovax

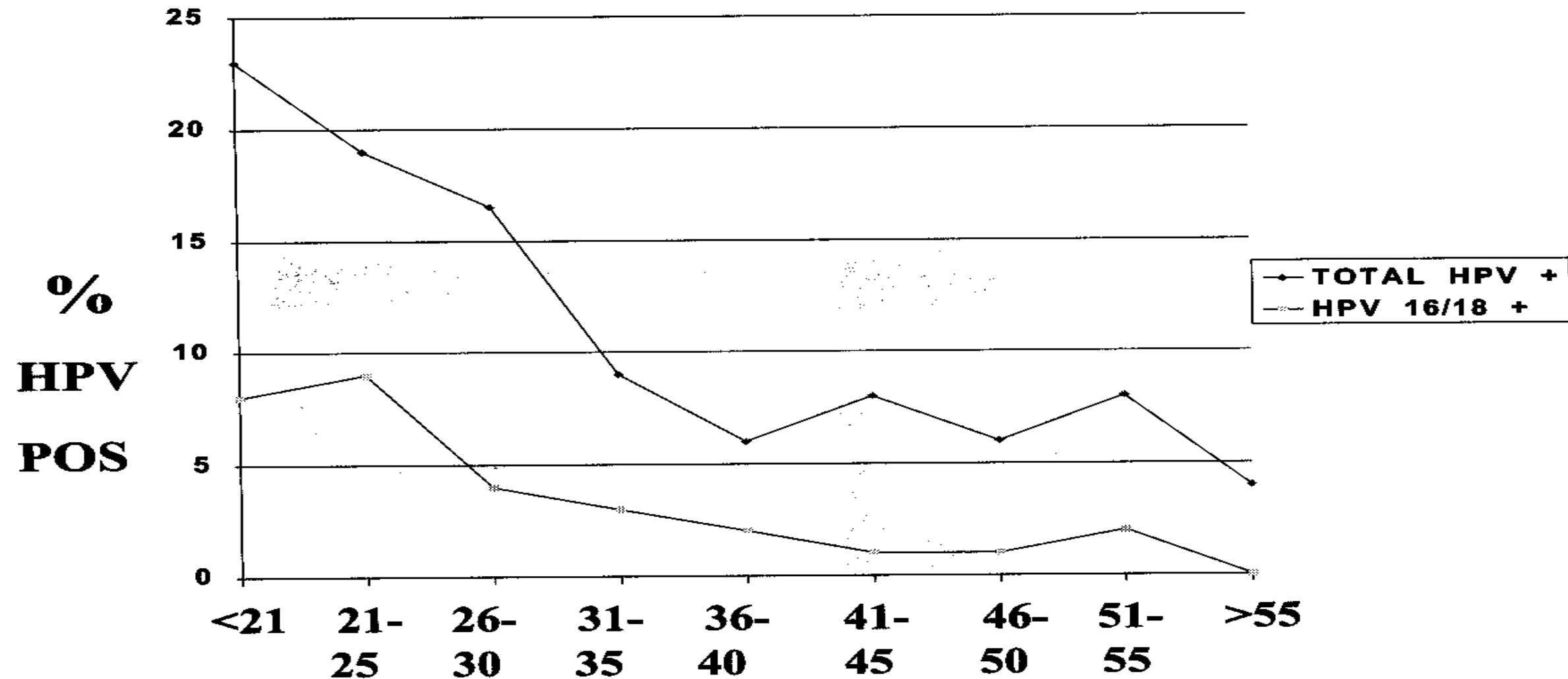
VACCINES

HPV

- Most common STI in the United States
 - 20 million infected
 - 6.2 million newly infected annually
- Increasing prevalence each year from ages 14 to 24, followed by a gradual decline through age 59 years.



HPV PREVALENCE BY AGE



The highest risk of testing positive for HPV is in the first few years after initiation of intercourse. Thereafter, HPV positivity declines with age, reflecting the transient nature of most HPV infections due to immune suppression.

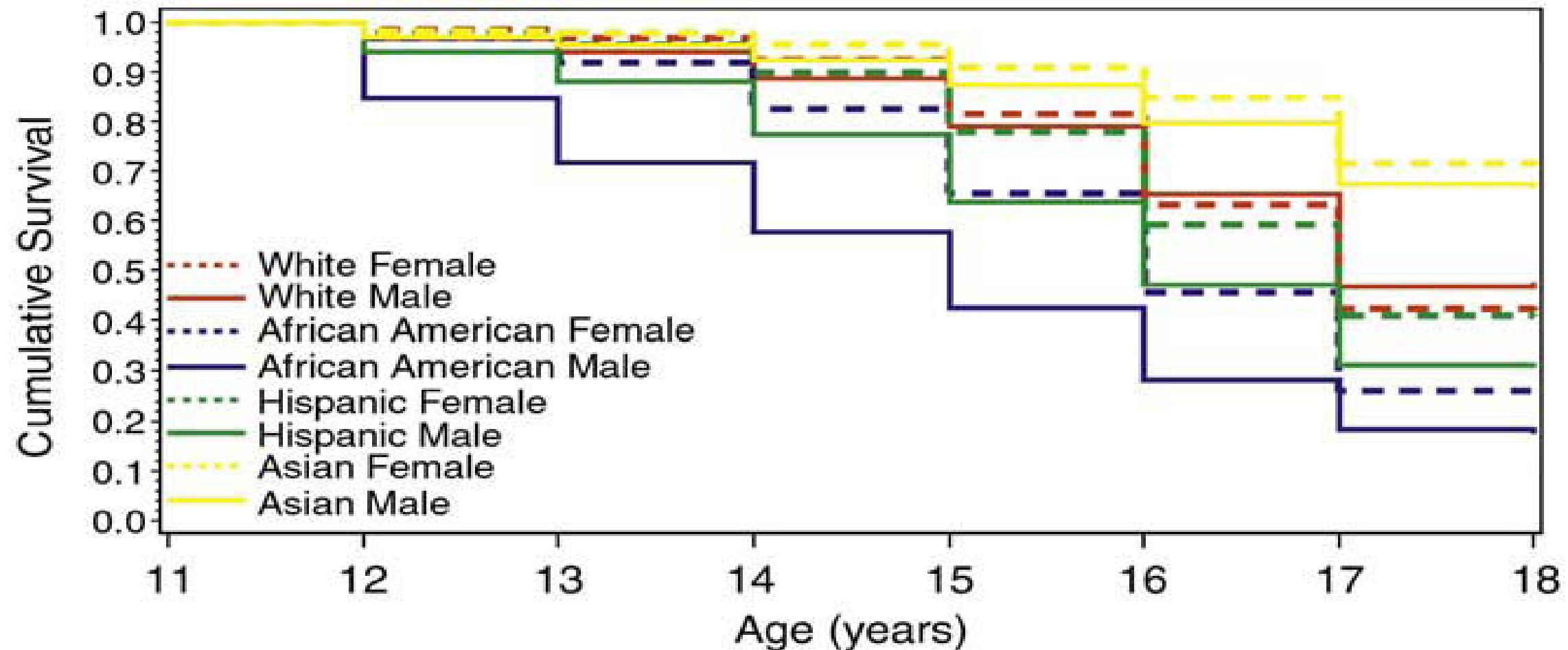
Selected Age

ACIP Recommendation (CDC) - Updated 27 March 2015

The recommendation for HPV vaccination for CHILDREN ages 11-12 is based on:

- Studies suggesting that HPV vaccines among adolescents will be safe and effective
- Can be started as young as 9 years of age
- The high antibody titers (persisting at least 5 years in initial clinical trials) achieved after vaccination at this age
- ACIP does not express a preference for either of the vaccine types
- Data on US HPV epidemiology and age of “sexual debut”

Age of Sexual Debut



Kaplan–Meier curves: probability of surviving free of sexual debut, according to race and gender.

Cavazos-Rehg PA, et. al. Age of sexual debut among US adolescents.

Rationale for Vaccinating Men

- Vaccinating women is effective
- Vaccinating men (permissive use from ACIP 2009)
 - Herd immunity with reduced spread to women
 - Reduction of disease burden in men
 - Cancer
 - Anal
 - Oral
 - Penile
 - Genital warts

Annual Number of New Cases of HPV-Related Cancers in American Men

Anatomic Area	New Cases	% with detectable HPV	New HPV-related cases
Oral Cavity	11,310	23	2600
Oropharynx	6,280	36	2455
Larynx	7,700	24	1850
Anal Cancer	1,910	88	1680
Penis	1,530	80	1225
Total	29,270	--	9,810

American Cancer Society: Cancer Facts and Figures 2005
Kreimer AR, et al. Cancer Epidemiol Biomarkers Prev 2005;14(2):467 -75
Ryan DP, et al. N Engl J Med 2000: 342:792-800
Daling JR, et al. Int J Cancer 2005;116:606-616

Vaccinating Adolescent Boys

ACIP recommended 26 October 2011; CDC Approved 23 December 2011

- Routine use of quadrivalent (or now 9 valent) HPV Vaccine in boys ages 11-12
 - **Catch-up dose for males ages 13-21**
 - Permissive use of vaccine ages 22-26
 - **Routine use in men ages 22-26 who have HIV infection or who have sex with men**
- Reason now routine:
 - Protect males from genital warts and certain cancers caused by HPV infection
 - Protect sexual partners from infection

HPV Vaccines Available

ACIP - 27 March 2015

Characteristic	Bivalent (2vHPV)*	Quadrivalent (4vHPV)	9-valent (9v-HPV)
Brand Name	Cevarix	Gardasil	Gardasil-9
VLPs	16,18	6,11,16,18	6,11,16,18,31,33,45,52,58
Manufacturer	GSK	Merck	Merck

* Only licensed for use in females in the US

Logistics of HPV Vaccination

- 3-dose schedule; second dose 1-2 months after the first dose; third dose 6 months after first dose
 - Minimum interval between first and second doses - 4 weeks; between second and third dose -12 weeks; between first and third dose - 24 weeks
- Whenever possible, the same HPV vaccine product should be used for all doses in the series

COST

- \$360 for 3 doses
 - Covered by Vaccine for Children Program
 - Cost prohibitive for uninsured adults
- HPV-related diseases cost at least \$4 billion in direct medical expenses

Vaccine-Type Human Papillomavirus and Evidence of Herd Protection After Vaccine Introduction

<http://pediatrics.aappublications.org/content/early/2012/07/03/peds.2011-3587.full.pdf+html>

- **Objectives:**
 - Compare prevalence rates of HPV in young women before and after HPV vaccine introduction to determine the following: (1) whether vaccine-type HPV infection decreased, (2) whether there was evidence of herd protection, and (3) whether there was evidence for type replacement (increased prevalence of nonvaccine-type HPV)
- **Results after propensity score weighting:**
 - Prevalence rate for vaccine-type HPV **decreased** substantially (31.7%–13.4%, $P < .0001$)
 - **Decrease** in vaccine-type HPV not only occurred among vaccinated (31.8%–9.9%, $P < .0001$) but **also among unvaccinated** (30.2%–15.4%, $P < .0001$) postsurveillance study participants
 - Nonvaccine-type HPV increased (60.7%–75.9%, $P < .0001$) for vaccinated postsurveillance study participants

Vaccine-Type Human Papillomavirus and Evidence of Herd Protection After Vaccine Introduction

<http://pediatrics.aappublications.org/content/early/2012/07/03/peds.2011-3587.full.pdf+html>

- **Conclusions**

- Four years after licensing of the quadrivalent HPV vaccine, there was:
 - a substantial decrease in vaccine-type HPV prevalence
 - evidence of herd protection in this community
- Increase in nonvaccine-type HPV in vaccinated participants should be interpreted with caution but warrants further study

Does HPV Vaccination Promote Unsafe Sex in Adolescent Females?

- Case-Control Study
 - Jena AB et al. Incidence of sexually transmitted infections after human papillomavirus vaccination among adolescent females. *JAMA Intern Med.* 2015 Feb 9; [e-pub]. (<http://dx.doi.org/10.1001/jamainternmed.2014.7886>)
- Comparison of STI rates over time between vaccinated and nonvaccinated patients found NO association between HPV vaccination and higher STI rate.
- As of 2013, only 38% of adolescent females aged 13-17 years had received all three doses
- Results of this large, rigorous analysis should be reassuring and could be used as a conversation starter with parents about opting for HPV vaccination for their children – both males and females

Herpes Zoster (HZ)

- 99.5% of US pop $\geq$ 40 yrs. old have (+) serology for previous varicella infection
- All older adults are at risk for Zoster
- No lab test to confirm previous Zoster
- Exact risk for and severity of zoster after a previous episode are unknown
 - Some experts think it is similar to those with no history
 - Confirmed in immunocompetent individuals



Photo provided by the CDC.

Other Risk Factors for Herpes Zoster

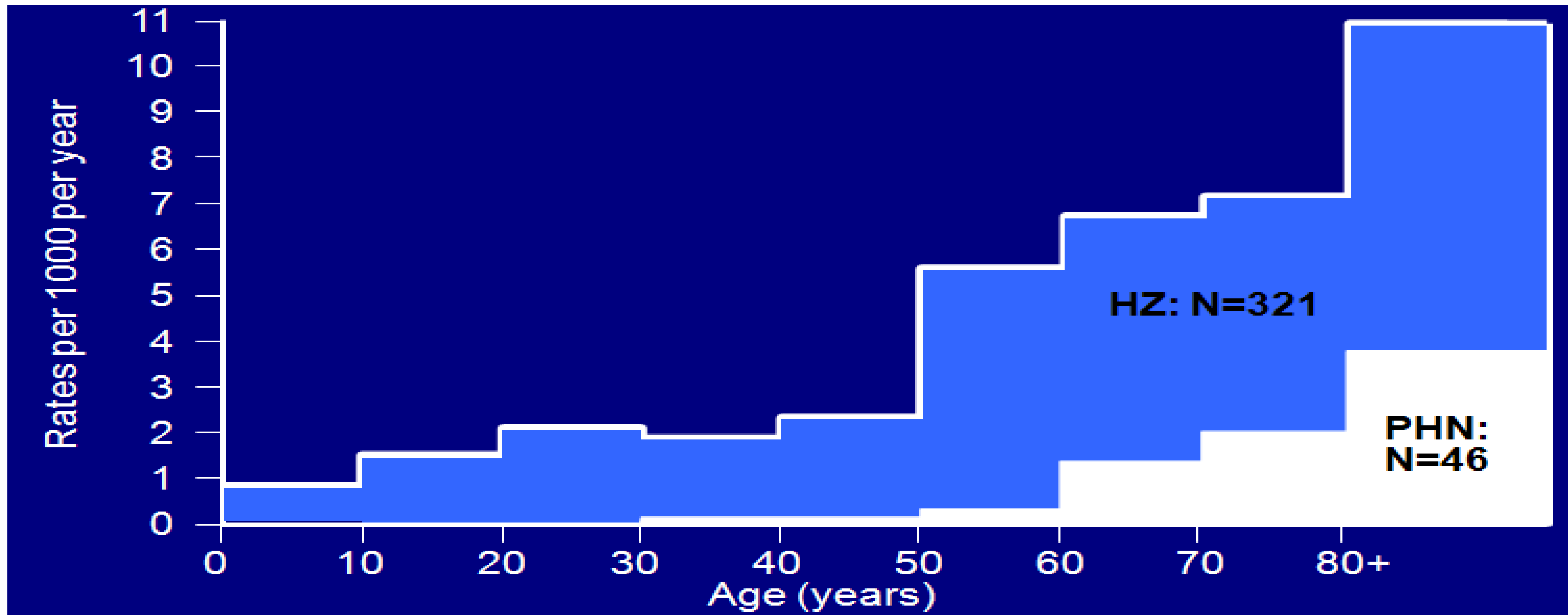
- Immunosuppression
 - Bone marrow and solid organ transplantation
 - Patients with hematological malignancies and solid tumors
 - HIV
 - Immunosuppressive medications
- Gender: Increased risk in females
- Race: Risk in blacks less than half that in whites
- Trauma or surgery in affected dermatome
- Early varicella (in utero, infancy): Increased risk of pediatric zoster

Herpes Zoster Vaccine



Attribute	Description
Type	Live attenuated varicella virus
Dosing	One dose is currently recommended at age 60 [SOR A]
Prevention of zoster	51% of those vaccinated*
Prevention of post-herpetic neuralgia	67% of those vaccinated*
Private insurance	Offer varying levels of coverage
Medicare Part B	Does NOT cover vaccine
Medicare Part D	Cover the vaccine; copays vary greatly among plans

Age-Specific Incidence of Herpes Zoster and Postherpetic Neuralgia: U.K., 1947-1972



Hope-Simpson *J R Coll Gen Pract* 1975.

Herpes Zoster (HZ)

- No upper age limit, better when given younger
- Previous h/o zoster once it has cleared (SOR C)



Photo provided by the CDC.

Herpes Zoster (HZ) Vaccine

FDA Licensure – 24 March 2011

- HZ Vaccine in < 60 yo?
 - Study of approximately 22,000 adults aged 50 through 59
 - Half the study subjects received Zostavax, and half received a placebo
 - Study participants monitored for at least 1 year for the development of herpes zoster
 - Compared with placebo, Zostavax reduced the risk for developing herpes zoster by 69.8% (95% confidence interval = 54.1--80.6) (3).

FDA NEWS RELEASE

For Immediate Release: March 24, 2011

FDA approves Zostavax vaccine to prevent shingles in individuals 50 to 59 years of age.

The Food and Drug Administration (FDA) today approved the use of Zostavax, a live attenuated virus vaccine, for the prevention of shingles in individuals 50 to 59 years of age. Zostavax is already approved for use in individuals 60 years of age and older.

In the United States shingles affects approximately 200,000 healthy people between the ages of 50 and 59, per year.

ACIP Update – Herpes Zoster Vaccine

June 2011 (*Reaffirmed August 22, 2014*)

MMWR 2011;60(44):1528-1528

MMWR 2014; 63 (33):729-733

- Considering all available evidence (2014) [and supply issues (2011)]; declined to recommend use of vaccine among adults aged 50 through 59 years
 - Considering the burden of HZ and its complications increases with age and that the *duration of vaccine protection in persons aged ≥ 60 years is uncertain* – recommendation remains unchanged ---
- ***Reaffirmed existing recommendation vaccine be routinely recommended for adults ≥ 60 years***

Efficacy and Duration of Protection

Study	Efficacy for prevention of Zoster	Efficacy for prevention of PHN
<i>Shingles prevention study</i> 38,546 subjects 4.9 year follow-up	51%	67%
<i>Short-term persistence substudy</i> 14,270 subjects 4-7 years follow-up	40%	60%
<i>Long-term persistence study</i> 6,687 subjects 7-10 years follow-up	21%	35%
<i>The effectiveness of HZ vaccine administered to patients > 60 years for preventing zoster beyond 5 years remains uncertain.</i>		

Choose to administer to those aged 50-59 despite the *absence* of an ACIP recommendation?

- Might consider –
 - Poor anticipated tolerance of herpes zoster and postherpetic neuralgia symptoms
 - Preexisting chronic pain
 - Severe depression
 - Other comorbid condition
 - Inability to tolerate treatment medications because of hypersensitivity or interactions with other chronic medications
 - Occupational considerations

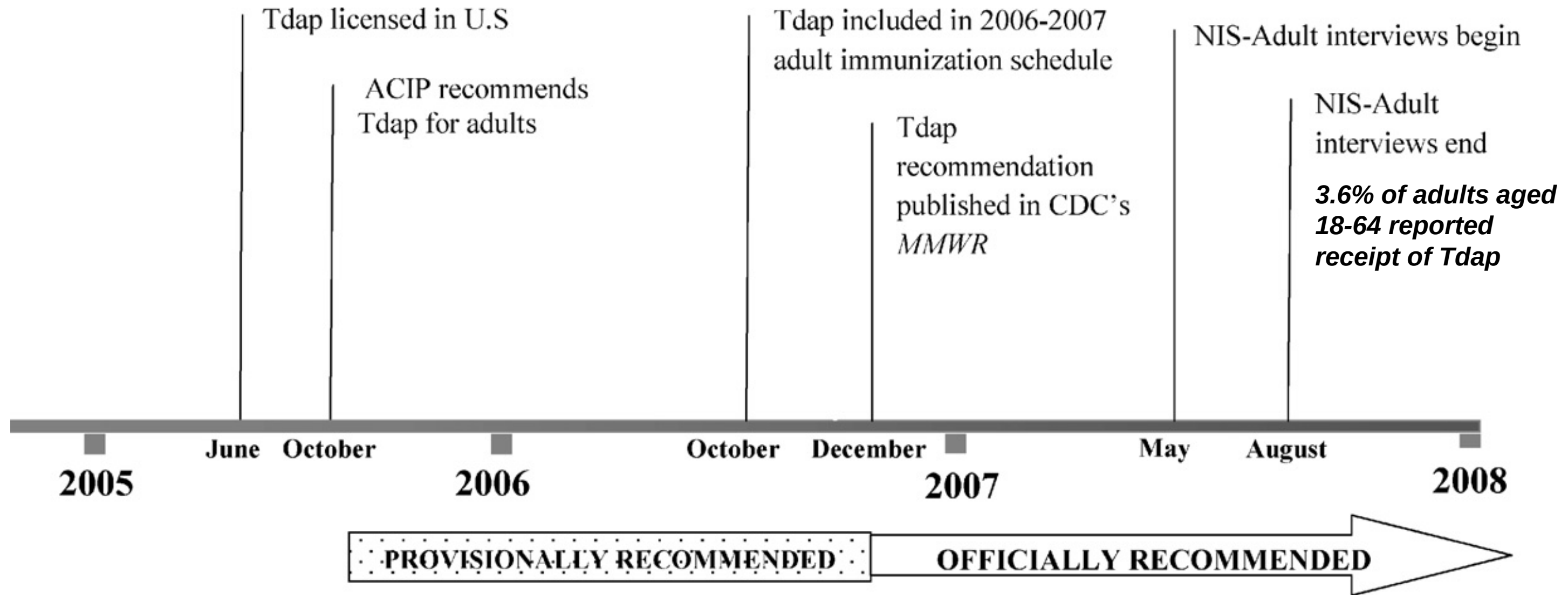
Herpes Zoster (HZ)

- Contraindications to HZ vaccine, a live attenuated virus
 - Immunosuppressed patient
 - ChemoRx
 - AIDS/HIV
 - Leukemia
 - Lymphoma
 - Those on certain immune modulators
 - High dose corticosteroids ($\geq 20\text{mg/d}$ for $> 2\text{wks}$)
 - Pregnancy
 - Active, untreated TB
- Stored frozen—may not be out of the freezer > 30 min

Timeline of Adult Tdap

Licensure, Availability, ACIP Recommendation

2007 National Immunization Survey



Miller et al., Barriers to early uptake of Tdap among adults – United States, 2005-2007. Vaccine 29(2011) 3850-3856

Of Unvaccinated Respondents...

- Low Collective Awareness
 - 18.8% had heard of Tdap
 - 9.4% reported that healthcare provider had recommended
- Low perceived risk of contracting pertussis was the SINGLE most common reason for either not vaccinating with Tdap or being unwilling to do so (44.7%)
- Most unvaccinated respondents (81.8%) indicated a willingness to receive Tdap if it was recommended by a provider

Pertussis

Kaiser Permanente Medical Center

- 9,100 cases of pertussis reported in California in 2010
 - The most cases since 1945
 - Fully immunized children aged 8-12 made up most of cases
 - 11 infant deaths
- ? Effectiveness of vaccinations at younger ages may have waned
- CDC broadening immunization recommendations to create a protective cocoon for newborns and infants

Newest Guidelines for Use of Tdap

CDC - MMWR – 23 September 2011/60(37);1279-1280

AAP and CDC – Pediatrics September 26, 2011

- Single dose of Tdap for children aged 7-10 years who did not receive full recommended series of DTaP before age 7; previously preferred ages were 11-18
- *Also...*
 - > age 19 one Tdap booster (including >65) – if no previous Tdap
 - Healthcare workers of all ages
 - Adolescents
- No caution regarding Tdap use with in any interval after Td; No minimal interval

Vaccines and Pregnancy

Safe

- Tdap*
- Influenza IV
- Hepatitis A, if at risk
- Hepatitis B, if at risk
- Meningococcal, if indicated
- Pneumococcal polysaccharide, if indicated

Wait until after pregnancy

- MMR
- Varicella
- HPV
- Influenza LAV

***ACIP Recommendations for Pregnant Women - 2013**

Administer a dose of Tdap during each pregnancy, irrespective of the patient's prior history of receiving Tdap.

Guidance for Use:

To maximize maternal antibody response and passive antibody transfer to the infant, optimal timing for Tdap administration is between 27 and 36 weeks gestation although Tdap may be given at any time during pregnancy. Women not previously vaccinated with Tdap, if Tdap is not administered during pregnancy, Tdap should be administered immediately postpartum.

Barriers to Recommendations

- Low collective awareness of Tdap
- Low perceived risk of contracting pertussis
- Paucity of provider-to-patient vaccination recommendations
 - *Miller et al. Vaccine 29(2011)3850-3856*
 - Significant potential exists for improved coverage
 - Most (81.8%) unvaccinated respondents (n= 3,217) indicated willingness to receive Tdap if it was recommended by provider

Influenza Vaccines 2014-2015

Vaccine*	Approved	Comments
<i>Standard dose trivalent</i>	6 months and older	Grown in eggs
<i>Standard dose trivalent</i>	18 years and older	Grown in cell culture
<i>Standard dose trivalent</i>	18-49 years	Egg-free
<i>High-dose trivalent</i>	65 and older	Grown in eggs
<i>Standard dose intradermal trivalent</i>	18-64 years	Injected into skin instead of the muscle
<i>Standard dose quadrivalent</i>	6 months and older	
<i>Standard dose quadrivalent given as a nasal spray</i>	Healthy people 2-49 years	

*CDC does not recommend one flu vaccine over the other.

Influenza

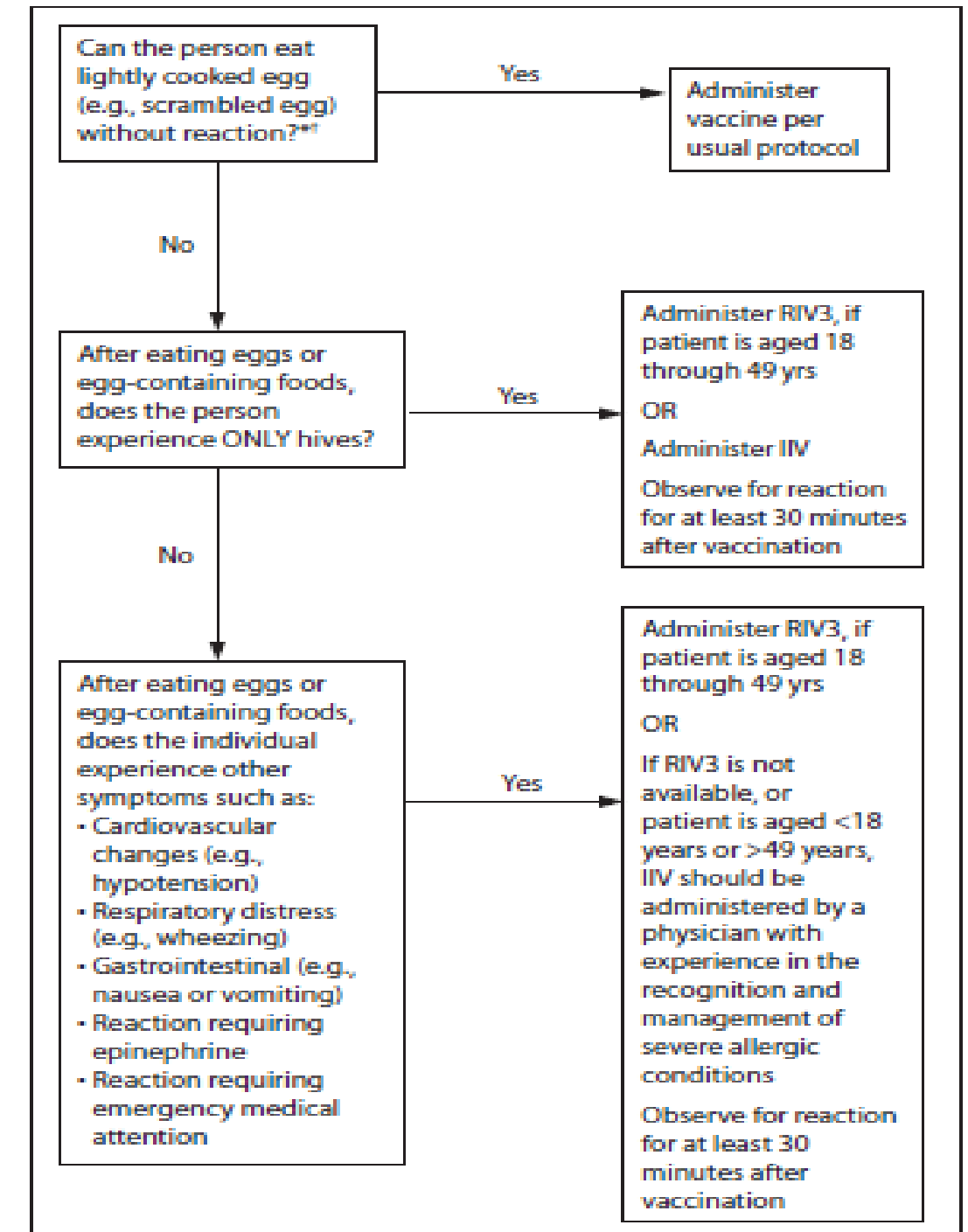
Vaccine

- Protects against the 3 (now 4) influenza viruses that research suggests will be most common
- CDC
 - Administer as soon as available
 - Can be given throughout entire influenza season (October-May, peak is January, February or later)
 - Emphasis should be placed on vaccinating individuals prior to the start of influenza activity in the community (SOR A)
 - A history of egg allergy is NO LONGER a strict contraindication (2012)
 - ACIP states that individuals who have experienced only hives after exposure to egg should receive the vaccine
 - No skin testing or “two-step” dose necessary
 - Observe for 30 minutes after administration

Flu Vaccine and Egg Allergy

MMWR – August 15, 2014; 63, No.32

FIGURE 2. Recommendations regarding influenza vaccination of persons who report allergy to eggs — Advisory Committee on Immunization Practices, United States, 2014–15 influenza season



First Quadrivalent Vaccine

FDA Approved

- Nasal Spray; Ages 2-49
- Two strains of Influenza A and two strains of Influenza B
 - Increase likelihood of adequate protection against circulating influenza B strains
 - During 5 of past 10 flu seasons, the predominant circulating influenza B lineage was different from the B lineage strain selected for inclusion in the trivalent vaccine

Vaccine Benefits

- When the vaccine is closely matched to the antigenic strains circulating in the population, there are decreases in antibiotic use, hospitalization, absenteeism, and the use of healthcare resources in general (SOR B)
- Two studies have shown a 30% decreased risk of acute otitis media in 2-year-olds given influenza vaccine (SOR B), but a large study of 14-month-old children did not show a decreased risk.

Which Vaccine in the Very Young?

(SOR C)

- Insufficient evidence to support use of the live attenuated influenza vaccine in children under the age of 2
- Children between 6 months and 2 years of age should ONLY receive the trivalent inactivated influenza vaccine
- Children 6 months or older with evidence of, or a history of, reactive airway disease should NOT receive the live attenuated influenza vaccine

Which Vaccine in Pregnancy?

(*SOR B*)



- Multiple studies have shown no adverse fetal effects from administration of the inactivated vaccine to the mother during pregnancy
 - AAFP, ACOG, CDC all recommend immunization for influenza in pregnant women during influenza season
 - Pregnant women should NOT receive the live attenuated vaccine
- Breastfeeding women should also be immunized, with either the trivalent inactivated or live attenuated influenza vaccine

Implications for Practice

Mayo AM and Cobler S. Flu Vaccines and Patient Decision Making: What We Need to Know. .

- Top motivators for obtaining a flu vaccine
 - Previous vaccination
 - Provider recommendation
- Top barriers
 - Fear of side effects
 - Fear of contracting the flu

Streptococcus pneumoniae

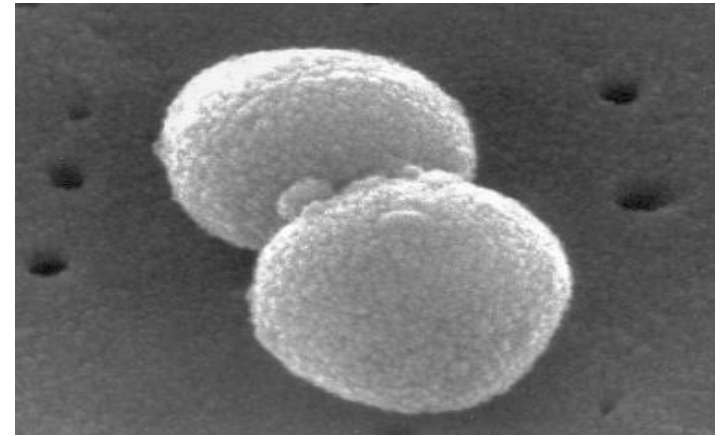


Image provided by the CDC.

- *S. pneumoniae* causes:
 - 19,000 preventable deaths per year (pneumonia, bacteremia, meningitis)
 - 7 million cases of otitis media per year
- Polyvalent vaccine (PPSV-23)
 - 23 serotypes that cause 80% of invasive pneumococcal disease in U.S.
 - B-cell response
 - 96% drop in pneumonia caused by susceptible strains
- PCV-13 (replaces PCV-7)
 - T-cell response

Polyvalent Vaccine (PPSV 23)

- Single dose at age > 65 years
- Children at risk ≥ 2 yrs. give at least 8 wks after last PCV 13
- Indications for single dose for those 2-64 years of age:
 - Chronic cardiac disease (especially cyanotic congenital and failure)
 - Cirrhosis, chronic liver disease, alcoholism
 - Cochlear implants, cerebrospinal fluid leak
 - Diabetes
 - Chronic lung disease, asthma, smoker
 - Residents of chronic care institutions
- Indications for 2 doses 3-5 years apart ages 2-64
 - Chronic renal disease (renal failure and nephrotic syndrome)
 - Asplenia, sickle cell*
 - Immunocompromised (HIV, congenital, leukemia/lymphoma, multiple myeloma, drugs or radiation, organ transplant)
- 2nd dose = more local site reactions

New ACIP Recommendation on Pneumococcal Vaccine

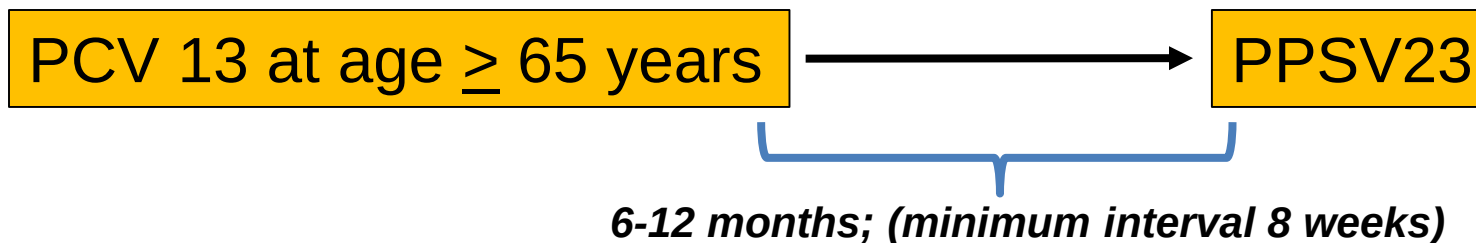
20 June 2012

- If $\geq$ age 19 with
 - Immunocompromising condition
 - Functional or anatomic asplenia
 - CSF leaks
 - Cochlear implants
- Give PCV 13 one or more years after the last PPSV 23
- Or if PCV 13 and PPSV 23 naive – receive single dose of PCV 13 followed by a dose of PPSV 23 at least 8 weeks later

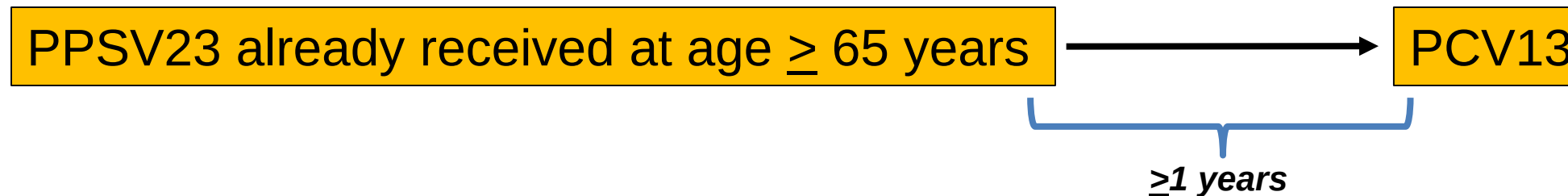
...and more new for Pneumococcal Vaccines

MMWR – 19 September 2014

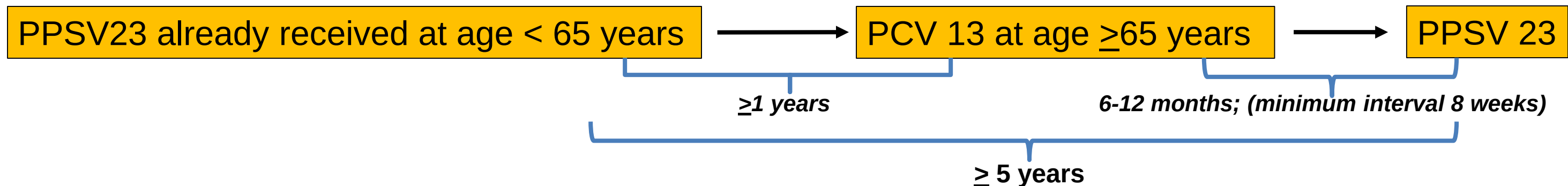
- *Pneumococcal vaccine-naïve persons aged ≥ 65*



- *Persons who previously received PPSV23 at age ≥ 65 years*



- *Persons who previously received PPSV23 before age 65 years and who are now aged ≥ 65*



3. INTERVENTIONS

1. BARRIERS

2. INFORMATION AND COMMUNICATION

Intervention Goals

- Reduce or eliminate morbidity and mortality that result from vaccine preventable diseases through the use of safe and effective vaccines
- Maximize vaccination coverage through universal access
- Use immunization to enhance the delivery of comprehensive, integrated healthcare and health promotion services to improve health and well being

Intervention

Vaccine Safety and Efficacy

- Counseling
 - Reliable patient education resources
- Motivational Interviewing
 - Adults with a negative attitude toward vaccination more likely receive vaccination if their doctor recommended it to them

Intervention

Access/Delivery

- Bring vaccines to where people are...

Delivery

- Office-based care
- Home-based care
- WIC program setting
- Child care
- School
- College settings
- Pharmacies
- Others???

Intervention

Delivery

- Bring vaccines to where people are
- Make vaccination a front-end priority, rather than an afterthought, and appropriately delegate authority

Intervention

Implications for Practice

- Use of standing order programs for vaccination – systematic approach
 - Empower personnel to administer immunizations without a provider order
 - State Immunization Registries
- Assessment of practice level vaccination rates with feedback to staff members
- Widely accepted practice management resources
 - ICD-10 codes tied to computerized algorithm/rule for vaccine eligibility (better than broad categories of chronic diseases in normal paper standing orders)
- Implementing reminder-recall systems
 - Recall and reminder systems have resulted in increases of up to 20% in rates of vaccination against
 - Hepatitis B
 - Tetanus
 - Influenza
 - Pneumococcal disease

Interventions

Vaccine Education Programs

- Utilize published immunization resources

Immunization Resources

- AAFP/AAP/CDC: Provider Resources for Vaccine Conversation with Parents
- CDC: Vaccine and Immunization Resources
- www.aafp.org/immunization
 - Standing Orders
 - Strategies
 - Mobile Application



Adult Vaccination



Adult Vaccination Home
Reasons to Vaccinate
Recommended Vaccines for Adults
Adult Vaccination Records
Finding and Paying for Vaccines
Vaccine-Preventable Adult Diseases
Resources

Related Links
Recommended Immunizations for Adults [2 pages]
Vaccines: The Basics
Vaccine Information Statements
ACIP Vaccination Recommendations
Adult Vaccination Resources for Healthcare Professionals

[Vaccines Home](#)



There Are Vaccines You Need as an Adult

All adults need:

- Influenza (flu) vaccine every year
- **Td** or **Tdap** vaccine: Every adult should get the Tdap vaccine once if they did not receive it as an adolescent to protect against pertussis (whooping cough), and then a Td (tetanus, diphtheria) booster shot every 10 years. In addition, women should get the Tdap vaccine each time they are pregnant, preferably at 27 through 36 weeks.

Other vaccines you may need as an adult are determined by factors such as:

- age
- lifestyle
- health conditions
- job
- international travel
- any previous vaccines you have received

Learn more about what other [vaccines may be recommended for you](#) and talk to your healthcare professional about which vaccines are right for you.



Contact Us:

 Centers for Disease Control and Prevention
1600 Clifton Rd
Atlanta, GA 30333
 800-CDC-INFO
(800-232-4636)
TTY: (888) 232-6348
[Contact CDC-INFO](#)

http://www.cdc.gov/vaccines/adults/index.html?s_cid=bb-vaccines-adults-ads-NCIRD-001

Resources and Tools for Adults

Find Out What Vaccines You Need

Do you know which adult vaccines you need?

Learn More about Adult Vaccines



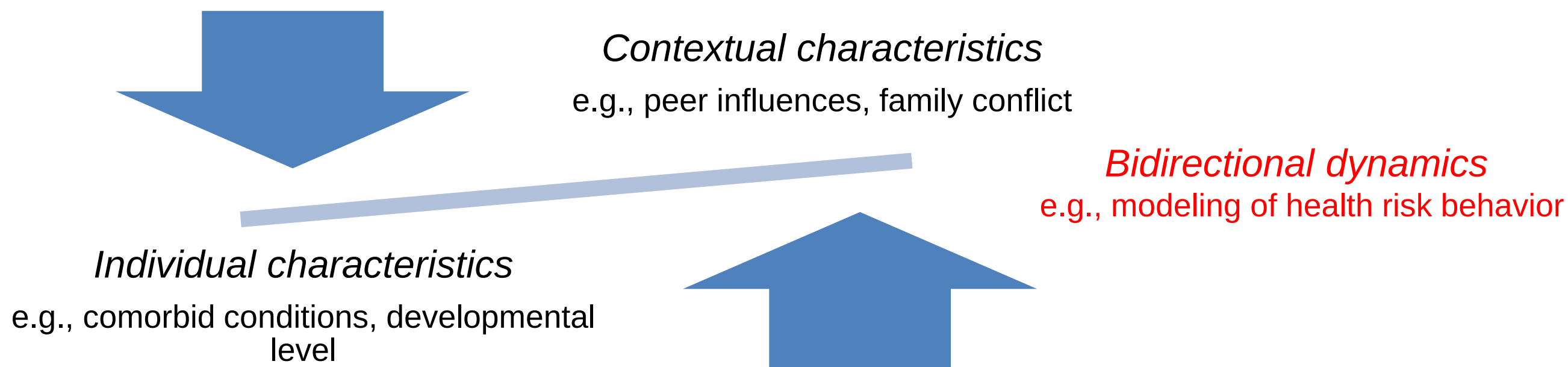
Online Vaccine Information Resources

Name	Description	Web site
CDC Advisory Committee on Immunization Practices	Recommendations for vaccine use in the United States	http://www.cdc.gov/vaccines/acip/index.html
CDC Pink Book	Detailed disease and vaccine information for healthcare professionals	http://www.cdc.gov/vaccines/pubs/pinkbook/index.html
CDC Yellow Book	Vaccine and health information for global travel	http://www.cdc.gov/travel/page/yellowbook-2012-home.htm
Immunization Action Coalition	Schedules, forms, and other documents for public use; expert advice	http://www.immunize.org/
Task Force on Community Preventive Services	Programs and policies to improve health and prevent disease in local communities	http://www.thecommunityguide.org/index.html
U.S. Food and Drug Administration	Licensing and safety information for U.S. vaccines	http://www.fda.gov/BiologicsBloodVaccines/Vaccines/default.htm

Vaughn JA and Miller RA. Update on Immunizations in Adults. Am Fam Physician. 2011;84(9):1015-1020.

So From Here...

- Future research must reflect the complexity of health-related behaviors and their relationship to individual and contextual systems at various levels of analysis over time
- Brief intervention outcome research must attend to the predictive value of vaccine administration strategies and resources



Summary

Consensus in the Literature

Barrier	Proposed Intervention
Lack of knowledge about immunizations	Provide printed or web-based materials (CDC Vaccine Information Statements)
Fear of vaccine safety	Share honestly what is known and not known about risks and benefits; Clinician understanding/explanation of complex but straightforward multisource scientific evidence
Limited access to immunization services	Simultaneous administration of all missing vaccines
Fear of vaccine related side-effects	Vaccines pose less of a risk than the diseases they are meant to prevent
Lack of physician recommendation	Routine assessment of immunization status
Provider with limited knowledge of vaccine indications and contraindications	Maintenance of knowledge of published preventive care guidelines
Fragmented adult care	Vaccine registries
Low perceived risk of contracting a disease	Educate on need for herd immunity to protect children and grandchildren

Summary

Key Recommendations for Practice

Clinical Recommendation	Evidence Rating
<i>The quadrivalent human papillomavirus vaccine may be considered in males and females nine to 26 years of age to prevent genital warts and cervical and anal cancers</i>	A
<i>Vaccination against herpes zoster is most effective when given as early as possible after 60 years of age</i>	C
<i>Vaccinating adults against pertussis, especially those in high-risk groups (e.g. healthcare professionals, persons who have close contact with infants younger than 12 months of age), reduces the risk of disease outbreaks</i>	C
<i>Annual influenza vaccination is recommended for all persons older than 6 months</i>	C

Vaughn JA and Miller RA. Update on Immunizations in Adults. Am Fam Physician. 2011;84(9):1015-1020.

Post-Assessment

Please complete your answers on the sheet provided in your syllabus.

The questions and answers have been scrambled and are not in the same order as the pre-assessment.

Please complete the session/speaker evaluation located on the back of your pre/post-assessment sheet and return to Chapter Staff as you exit.

Pre-Assessment Question #1

Key recommendations for practice in examining immunizations in adults include which one of the following?

- A. Vaccinating adults against pertussis, especially those in high-risk groups, increases the risk of disease outbreaks
- B. Annual influenza vaccination is recommended for only persons older than 24 months
- C. The quadrivalent human papillomavirus vaccine may be considered in males and females to prevent genital warts and cervical and anal cancers
- D. Vaccination against herpes zoster is most effective when given as early as possible after 50 years of age

Pre-Assessment Question #2

Each of the following individuals would receive a single dose of PCV 13 followed by a dose of PPSV 23 at least 8 weeks later **EXCEPT**:

- A. Individual with a cochlear implant
- B. Individual with functional asplenia
- C. Individual with cirrhosis
- D. Individual with a CSF leak

Pre-Assessment Question #3

Regarding adult immunizations, which of the following statements is true?

- A. The Advisory Committee on Immunization Practice recommends HPV vaccine may be used in women up until age 26 and in men up until age 21.
- B. The Advisory Committee on Immunization Practice currently recommends one dose of Zostavax at age 50.
- C. The minimum recommended interval by the Advisory Committee on Immunization Practice to administer a Tdap after having had a Td is 24 months.
- D. The Advisory Committee on Immunization Practice states that individuals who have experienced only hives after egg exposure should receive the Influenza Vaccine.

Thank You!

