Immunization Techniques – Back to Basics

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Disclosures

Andrew Kroger is a federal government employee with no financial interest or conflict with the manufacturer of any product named in this presentation

Andrew Kroger will not discuss a vaccine not currently licensed by the FDA

Disclosures

Andrew Kroger will discuss off-label uses meningococcal conjugate vaccine (MCV4) human papillomavirus vaccine (HPV), and tetanus-reduced-diphtheria-toxoid acellular pertussis vaccine (Tdap)

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

Disease	20th Century Annual Morbidity†	2010 Reported Cases ††	Percent Decrease
Smallpox	29,005	0	100%
Diphtheria	21,053	0	100%
Measles	530,217	61	> 99%
Mumps	162,344	2,528	98%
Pertussis	200,752	21,291	89%
Polio (paralytic)	16,316	0	100%
Rubella	47,745	6	> 99%
Congenital Rubella Syndrome	152	0	100%
Tetanus	580	8	99%
Haemophilus influenzae	20,000	270*	99%

†Source: JAMA. 2007;298(18):2155-2163

†† Source: CDC. MMWR January 7, 2011;59(52);1704-1716. (provisional MMWR week 52 data)

* 16 type b and 254 unknown serotype (< 5 years of age)

What's New in Immunization

- MCV4 vaccine
- HPV vaccine
- Measles Outbreaks
- Influenza Vaccine
- Zoster Vaccine
- Pneumococcal Polysaccharide Vaccine
- Tdap vaccine

Adult Immunization Schedule Indications by Age Group - 2011

Recommended Adult Immunization Schedule

UNITED STATES - 2011

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 group

VACCINE / AGE GROUP	19–26 years	27–49 years	50–59 years	60–64 years	≥65 years
Influenza[1,*]	1 dose annually				
Tetanus, diphtheria, pertussis (Td/Tdap)[2,*]	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs				Td booster every 10 yrs
Varicella[3,*]	2 doses				
Human papillomavirus (HPV)[4,*]	3 doses (females)				
Zoster[5]				1 dose	
Measles, mumps, rubella (MMR)[6,*]	1 or 2 doses		1 dose		
Pneumococcal (polysaccharide)[7,8]	1 or 2 doses				1 dose
Meningococcal[9,*]	1 or more doses				
Hepatitis A[10,*]	2 doses				
Hepatitis B[11,*]	3 doses				

*Covered by the Vaccine Injury Compensation Program.

For all persons in this category who meet the age requirements and who lack evidence of immunity (e.g., lack documentation of vaccination or have no evidence of previous infection)

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

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 http://www.vaers.hhs.gov or by telephone, 800-822-7967.

Information on how to file a Vaccine Injury Compensation Program claim is available at http://www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382. Information about filing a claim for vaccine injury is available through 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 also is available at http://www.cdc.gov/vaccines or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 24 hours a day, 7 days a week.

Adult Immunization Schedule Indications by Condition - 2011

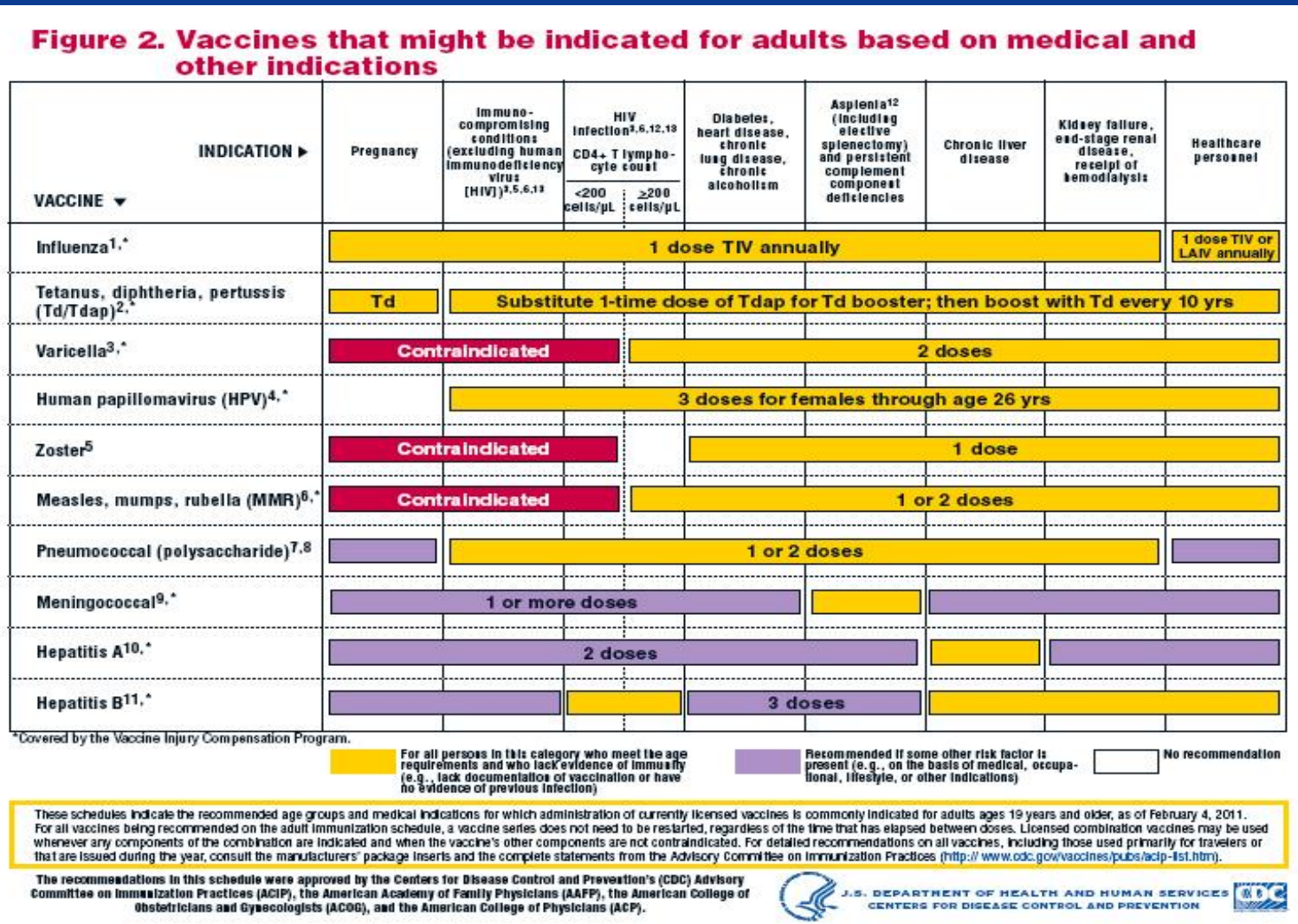


Figure 2. Vaccines that might be indicated for adults based on medical and other indications

VACCINE ▼ / INDICATION ▶	Pregnancy	Immunocompromising conditions (excluding human immunodeficiency virus [HIV])[3,5,6,13]	HIV infection[3,6,12,13] CD4+ T lymphocyte count <200 cells/µL	HIV infection[3,6,12,13] CD4+ T lymphocyte count ≥200 cells/µL	Diabetes, heart disease, chronic lung disease, chronic alcoholism	Asplenia[12] (including elective splenectomy) and persistent complement component deficiencies	Chronic liver disease	Kidney failure, end-stage renal disease, receipt of hemodialysis	Healthcare personnel
Influenza[1,*]	1 dose TIV annually								1 dose TIV or LAIV annually
Tetanus, diphtheria, pertussis (Td/Tdap)[2,*]	Td	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs							
Varicella[3,*]	Contraindicated			2 doses					
Human papillomavirus (HPV)[4,*]		3 doses for females through age 26 yrs							
Zoster[5]	Contraindicated				1 dose				
Measles, mumps, rubella (MMR)[6,*]	Contraindicated			1 or 2 doses					
Pneumococcal (polysaccharide)[7,8]		1 or 2 doses							
Meningococcal[9,*]	1 or more doses								
Hepatitis A[10,*]	2 doses								
Hepatitis B[11,*]	3 doses								

*Covered by the Vaccine Injury Compensation Program.

For all persons in this category who meet the age requirements and who lack evidence of immunity (e.g., lack documentation of vaccination or have no evidence of previous infection)

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

No recommendation

These schedules indicate the recommended age groups and medical indications for which administration of currently licensed vaccines is commonly indicated for adults ages 19 years and older, as of February 4, 2011. 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 (http:// www.cdc.gov/vaccines/pubs/acip-list.htm).

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 Obstetricians and Gynecologists (ACOG), and the American College of Physicians (ACP).

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

Persons at Highest Risk of Meningococcal Disease or Suboptimal Vaccine Response

Persons with Suboptimal Vaccine Response

HIV infection

– evidence of suboptimal response

Single dose primary series may not be sufficient to confer protection for persons with these high-risk conditions

New MCV4 Recommendations

thereafter

MMWR 2011;60(No. 3):72-6.

New MCV4 Recommendations

not

doses at least 8 weeks apart

MMWR 2011;60(No. 3):72-6.

New MCV4 Recommendations

MMWR 2011;60(No. 3):72-6.

CDC

MMWR

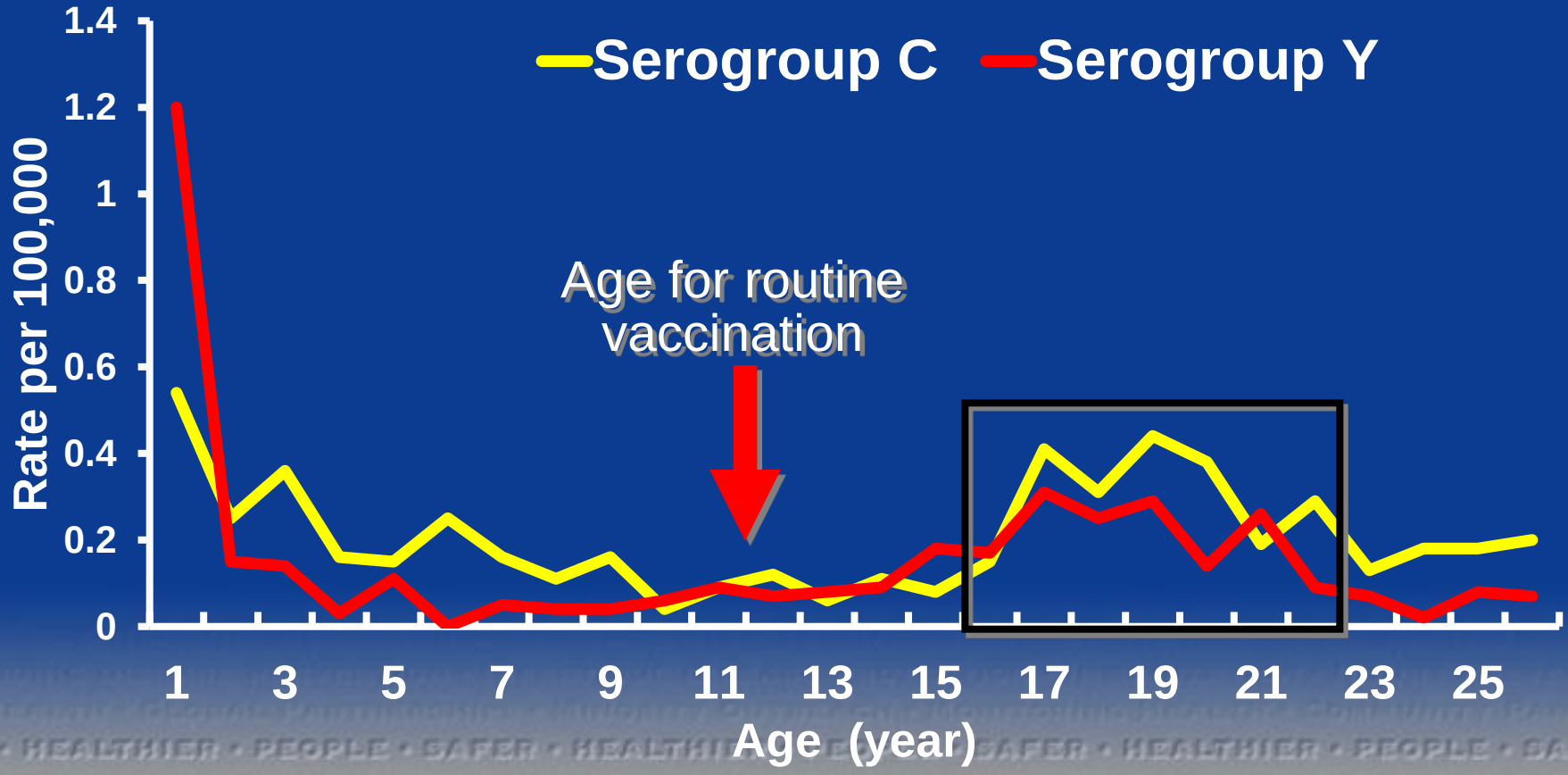
Morbidity and Mortality Weekly Report

Recommendations and Reports | May 27, 2005 / Vol. 54 / No. RR-7

Prevention and Control of Meningococcal Disease

Recommendations of the Advisory Committee on Immunization Practices (ACIP)

Rates of Meningococcal Disease (C and Y) by Age, 1999-2008



Active Bacterial Core surveillance (ABCs), 1998-2008

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Meningococcal Conjugate (MCV4) Routine Revaccination

In its 2005 recommendations for MCV, ACIP made no recommendation about revaccination pending the availability of additional data

Serologic data are now available from the manufacturer that show significant decline in antibody 3-5 years after vaccination although few "breakthrough" cases have been reported

MMWR 2009;58(No. 37):1042-3

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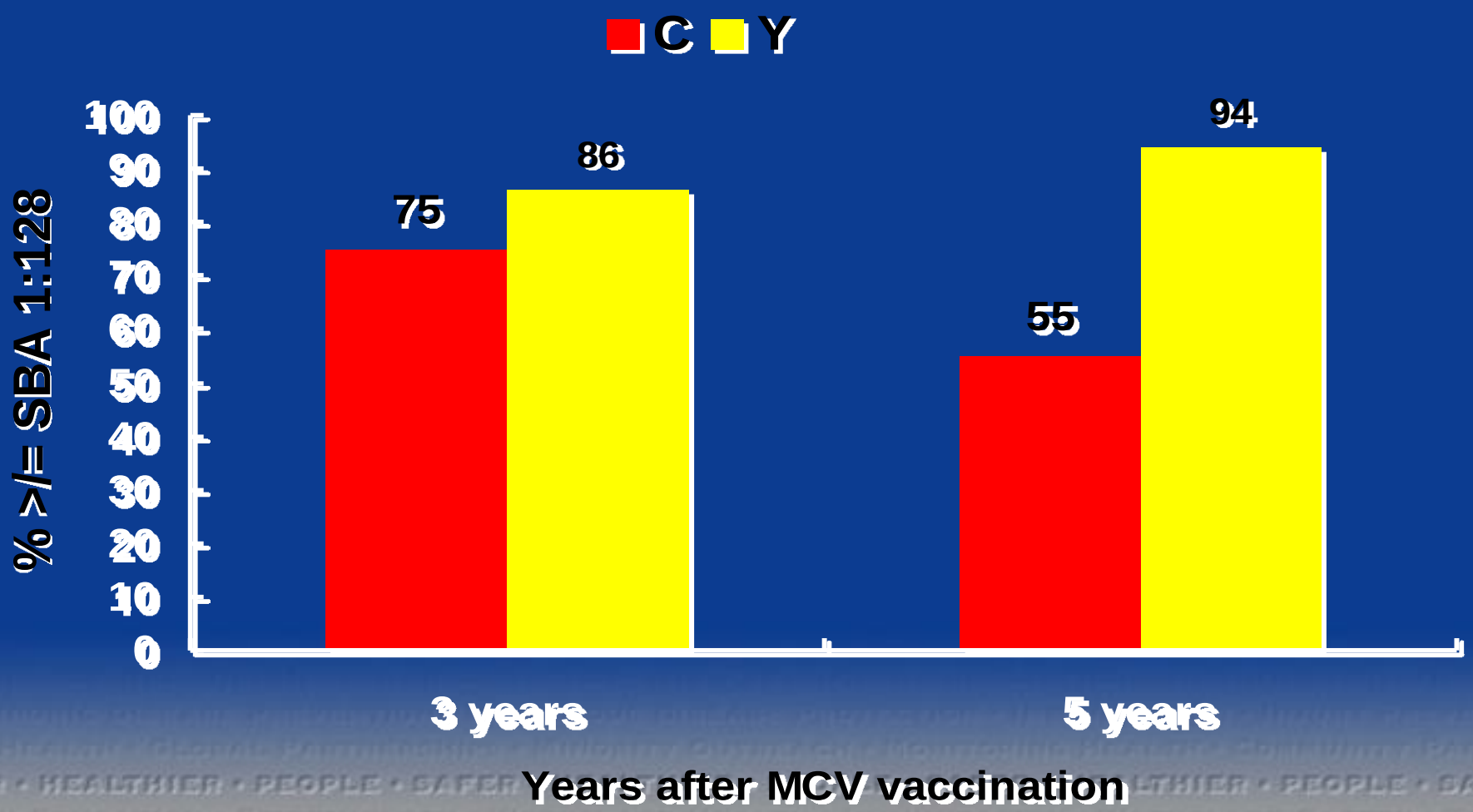
Seroprotection Rates Following MCV Vaccination



MMWR 2009;58(No. 37):1042-3

Morbidity and Mortality Weekly Report

Updated Recommendations for Use of Meningococcal Conjugate Vaccines — Advisory Committee on Immunization Practices (ACIP), 2010

On October 27, 2010, the Advisory Committee on Immunization Practices (ACIP) approved updated recommendations for the use of quadrivalent (serogroups A, C, Y, and W-135) meningococcal conjugate vaccines (Menveo, Novartis; and Menactra, Sanofi Pasteur) in adolescents and persons at high risk for meningococcal disease. These recommendations supplement the previous ACIP recommendations for meningococcal vaccination (*1*,*2*). The Meningococcal Vaccines Work Group of ACIP reviewed available data on immunogenicity in high-risk groups, bactericidal antibody persistence after immunization, current epidemiology, vaccine effectiveness (VE), and cost-effectiveness of different strategies for vaccination of adolescents. The Work Group then presented policy options for consideration by the full ACIP. This report summarizes two new recommendations approved by ACIP: 1) routine vaccination of adolescents, preferably at age 11 or

Meningococcal disease incidence has decreased since 2000, and incidence for serogroups C and Y, which represent the majority of cases of vaccine-preventable meningococcal disease, are at historic lows. However, the peak in disease among persons aged 18 years (Figure) has persisted, even after routine vaccination was recommended in 2005. In the 2009 National Immunization Survey-Teen, 53.6% of adolescents aged 13 through 17 years had received a dose of meningococcal vaccine (*3*). From 2000–2004 to 2005–2009, the estimated annual number of cases of serogroups C and Y meningococcal disease decreased 74% among persons aged 11 through 14 years but only 27% among persons aged 15 through 18 years. Cases of meningococcal disease caused by serogroups C and Y among persons who were vaccinated with meningococcal conjugate vaccine have been reported. An early VE analysis that modeled expected cases of disease in vaccinated persons estimated a VE

MMWR 2011;60(No. 3):72-6.

New MCV4 Recommendations*

booster dose

*off-label recommendation. *MMWR* 2011;60(No. 3):72-6.

New MCV4 Adolescent Vaccination Recommendations

MCV Revaccination Recommendations*

Other high-risk persons recommended for revaccination

- microbiologists with prolonged exposure to *Neisseria meningitidis*
- frequent travelers to or persons living in areas with high rates of meningococcal disease

Revaccinate every 5 years as long as the person remains at increased risk

Every 3 years if first dose given between 2 through 6 years of age

- MCV4 for persons 2 through 55 years of age
- MPSV for persons 56 years and older

*off-label recommendation. *MMWR* 2009;58(No. 37):1042-3

HPV Prevalence: Population Estimates, U.S.

20 million people are infected

6.2 million new infections each year

> 50% of sexually active men & women acquire genital HPV infection

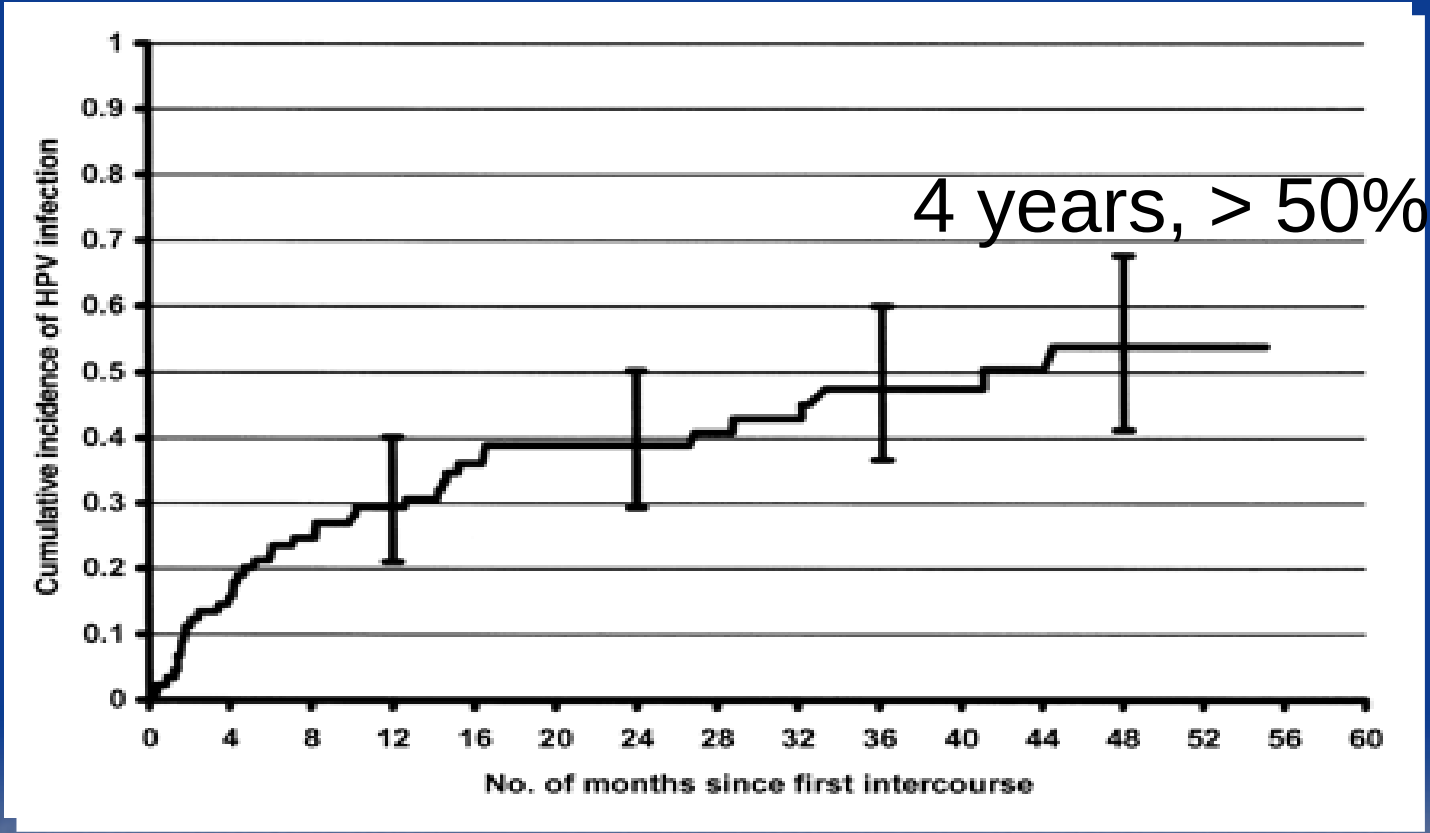
74% of new infections occur in persons 15 – 24 years of age

W. Cates, STD April 1999, Weinstock, Perspectives on Sexual and Reproductive Health 2004, Koutsky Am J Med 1997

HPV-Associated Disease

Type	Women	Men
16/18	70% of Cervical Cancer 70% of Anal/genital Cancer	70% of Anal Cancer
6/11	90% of Genital Warts 90% of RRP lesions	90% of Genital Warts 90% of RRP lesions

Cumulative Incidence of Any HPV Infection
Months after sexual initiation



Am J Epidemiol, 2003;157(3):218-26

Cervical Cancer Disease Burden in the United States

The American Cancer Society estimates that in 2009

- 11,270 new cervical cancer cases
- 4,070 cervical cancer deaths

Almost 100% of these cervical cancer cases were caused by one of the 40 HPV types that infect the mucosa

Source: American Cancer Society
www.cancer.org/

Human Papillomavirus Vaccines

Two HPV vaccines are available

Both vaccines contain noninfectious HPV L1 major capsid protein

L1 protein is produced using recombinant technology

Both vaccine contain an aluminum-based adjuvant

Neither vaccine contains preservative or antibiotic

HPV Vaccines

HPV4 (Gardasil, Merck)

- contains HPV types 16, 18, 6 and 11
- approved for the prevention of cervical, vaginal and vulvar cancers (in females) and genital warts (in females and males)

HPV2 (Cervarix, GSK)

- contains HPV types 16 and 18
- approved for the prevention of cervical cancers in females

HPV Vaccination Schedule

Routine schedule is 0, 1-2, 6 months

Minimum intervals

- 4 weeks between doses 1 and 2
- 12 weeks between doses 2 and 3
- 24 weeks between doses 1 and 3

Administer at the same visit as other age-appropriate vaccines – Tdap, MCV

HPV Vaccine Efficacy

	HPV4 16-26 y/o females		HPV2 15-25 y/o females	
	N	VE	N	VE
HPV 16/18 CIN2/3 or AIS	8,493	98%	7,344	93%
HPV 6/11 EGL	6,932	99%	--	--

Manufacturer clinical trial data

Vaccine Efficacy for HPV 6,11,16,18-Related External Genital Lesions (EGL) for Boys and Men 16 Through 26 Years of Age

Endpoint	Vaccine Group (N=1397)	Placebo Group (N=1408)	Efficacy (%)
HPV 6/11/16/18-related EGL	3	31	90
HPV 6/11/16/18-related condyloma	3	28	89
HPV 6/11/16/18-related PIN* 1/2/3	0	3	100*

*Penile/perineal/perianal intraepithelial neoplasia (PIN) grades 1/2/3; too few cases identified to reach statistical significance. Merck data.

Human Papillomavirus Vaccines

- High efficacy among females without evidence of infection with vaccine HPV types
- No evidence that the vaccine had efficacy against existing disease or infection
- Prior infection with one HPV type did not diminish efficacy of the vaccine against other vaccine HPV types
- HPV4 reduces the risk of genital warts in males but reduction in anogenital cancer risk among males has not yet been demonstrated

HPV Vaccine Interchangeability

No data on schedules that include both HPV2 and HPV4

Response to types 16 and 18 likely to be similar when HPV2 and HPV4 used in the same series

Protection against types 6 and 11 probably reduced if fewer than 3 doses of HPV4 received

Use same vaccine for all 3 doses whenever possible

HPV Vaccine "Special Situations"

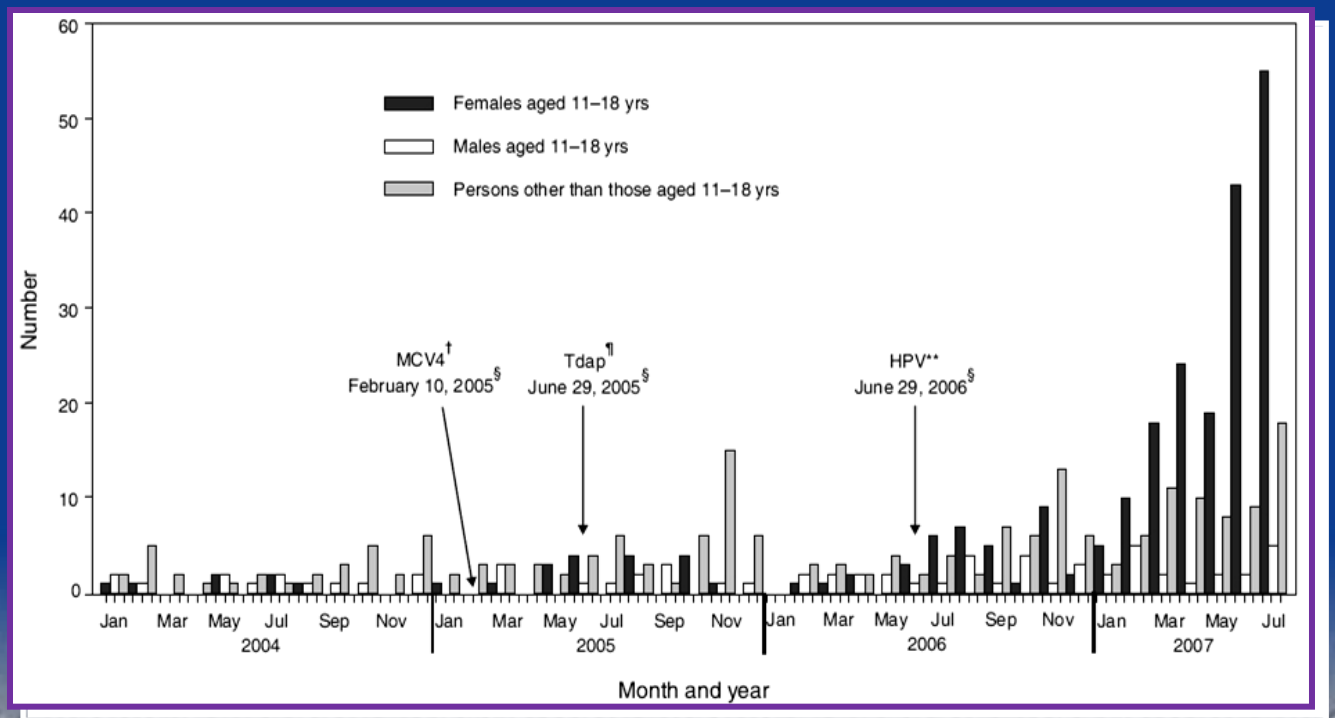
Vaccine can be administered to females with:

- equivocal or abnormal Pap test
- positive HPV DNA test
- genital warts
- immunosuppression
- breastfeeding

MMWR 2010;59(No. 20):626-9

Number of Postvaccination Syncope* Episodes Reported to the Vaccine Adverse Event Reporting System

By month and year report – United States, January 1, 2004 - July 31, 2007



MMWR 2008;57(No. 17):457-60

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Prevention of Syncope After Vaccination

Vaccine providers should strongly consider observing patients for 15 minutes after they are vaccinated

ACIP recommends providers have their patients sit down before receiving a dose of vaccine

MMWR 2008;57(No. 47):457-60; *MMWR* 2006;55(RR-15):19

Cervical Cancer Screening

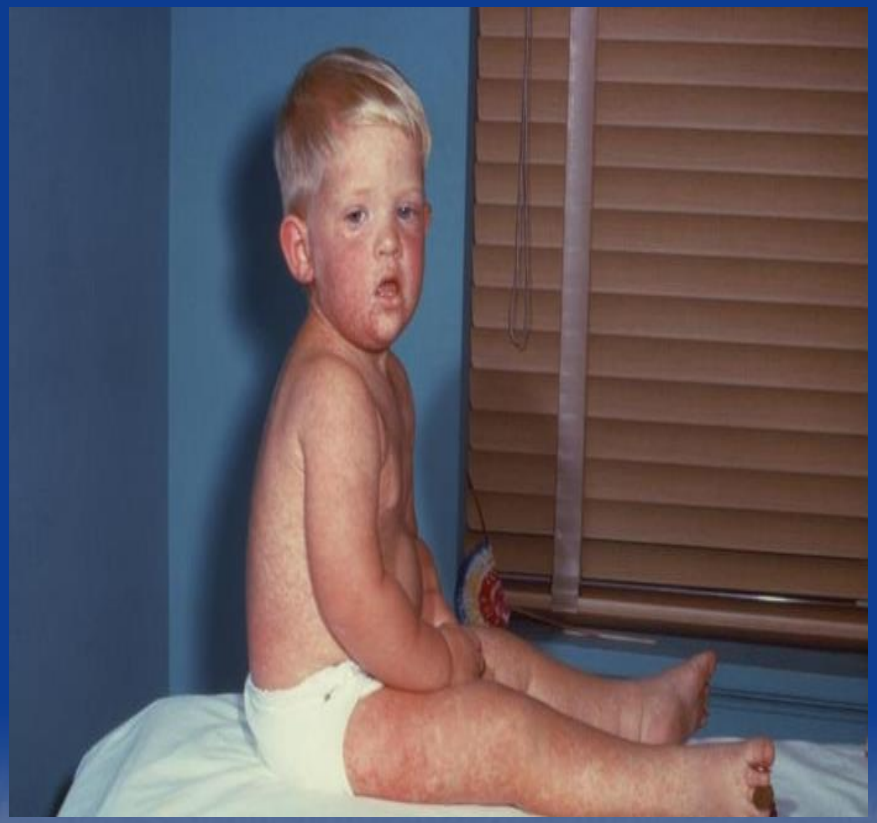
Cervical cancer screening – no change

- 30% of cervical cancers caused by HPV types not prevented by the quadrivalent HPV vaccine
- Vaccinated females could subsequently be infected with non-vaccine HPV types
- Sexually active females could have been infected prior to vaccination

Providers should educate women about the importance of cervical cancer screening

MMWR 2007;56(RR-2):1-24

Measles



Over 118 cases cases this year

105 known to be linked to importation (74% travelers from U.S.)

MMR

A dose is recommended for travelers between 6 through 12 months of age

Does NOT count toward the two dose routine series

2011-2012 Influenza Vaccine Composition

Same strains this year as last year:

- A/California/7/2009-like H1N1
- A/Perth/16/2009-like H3N2
- B/Brisbane/60/2008

Duration of Immunity Following Influenza Vaccination

- Protection against viruses that are similar antigenically to those contained in the vaccine extends for at least 6-8 months
- There is no clear evidence that immunity declines more rapidly in the elderly
- Additional vaccine doses during the same season do not increase the antibody response
- The frequency of breakthrough infections has not been shown to be higher among persons vaccinated early in the season

Skowronski et al. *J Infect Dis* 2008;197:490-502

Influenza Vaccination Recommendation

Annual influenza vaccination is now recommended for every person in the United States 6 months of age and older

MMWR 2010;59(RR-8)

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Influenza Vaccine Presentations 2010-2011

Vaccine	Doseform	Age
Fluzone TIV (sanofi pasteur)	SDS, SDV, MDV	6 months and older
Fluarix TIV FluLaval TIV (GSK)	SDS MDV	3 years and older 18 years and older
Fluvirin TIV Agriflu TIV (Novartis)	SDS, MDV SDS	4 years and older 18 years and older
Afluria TIV (CSL)	SDS	9 years and older
Flumist LAIV (MedImmune)	Nasal spray	2-49 years (healthy, nonpregnant)

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SDS=single dose syringe; SDV=single dose vial; MDV=multidose vial

Fluzone High-Dose

Manufactured by Sanofi Pasteur

Contains 4 X amount of influenza antigen than regular Fluzone

Approved only for persons 65 years and older

Produced higher antibody levels; slightly higher local reactions

Studies underway to assess relative effectiveness

These expected for the 2012-2013 season

No preference stated by ACIP for HD or regular influenza vaccination

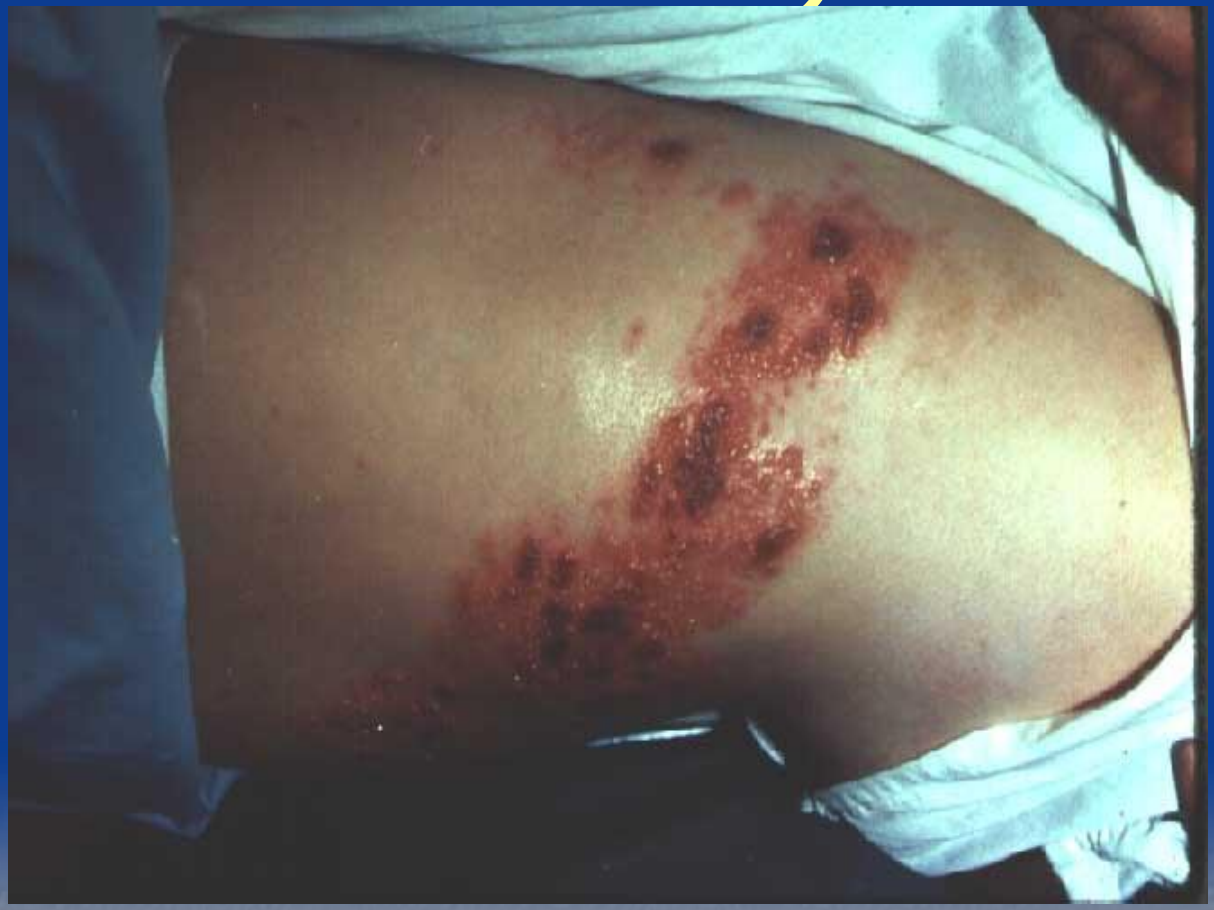
Live Attenuated Influenza Vaccine Indications

Persons 2 through 49 years of age

- who are healthy (i.e., do not have an underlying medical condition that increases the risk of complication of influenza)
- who are not pregnant
- who do not have contact with a severely immunosuppressed person (hospitalized and in isolation)

MMWR 2010;59(RR-8)

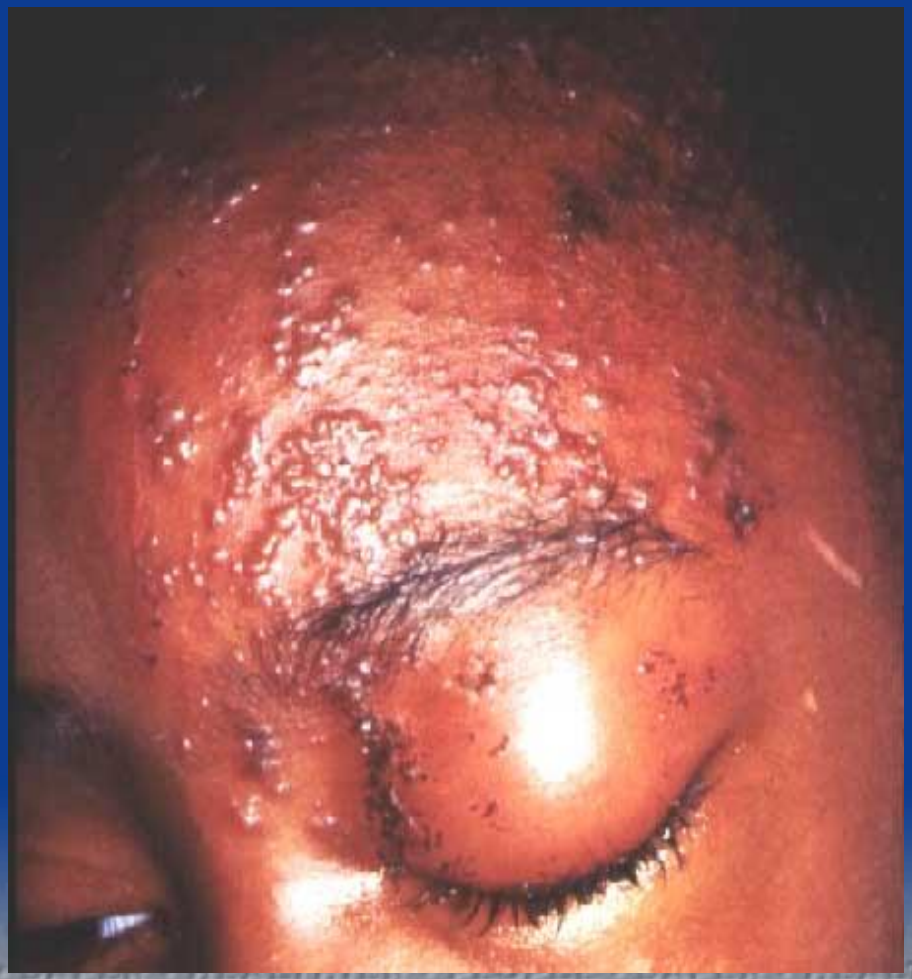
Shingles (Herpes Zoster)



Zoster

- Generally associated with normal aging and with anything that causes reduced immunocompetence
- Lifetime risk of 30% in the United States
- Estimated 500,000- 1 million cases of zoster diagnosed annually in the U.S

Zoster



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Zoster: Complications

- Post-herpetic neuralgia
- Pain that lasts after rash clears, sometime up to a year
- Occurs in 20 percent of shingles cases
- Highest risk in persons older than 60 years

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JUNE 2, 2005 VOL. 352 NO. 22

A Vaccine to Prevent Herpes Zoster and Postherpetic Neuralgia in Older Adults

M.N. Oxman, M.D., M.J. Levin, M.D., G.R. Johnson, M.S., K.E. Schmader, M.D., S.E. Straus, M.D., L.D. Gelb, M.D., R.D. Arbeit, M.D., M.S. Simberkoff, M.D., A.A. Gershon, M.D., L.E. Davis, M.D., A. Weinberg, M.D., K.D. Boardman, R.Ph., H.M. Williams, R.N., M.S.N., J. Hongyuan Zhang, Ph.D., P.N. Peduzzi, Ph.D., C.E. Beisel, Ph.D., V.A. Morrison, M.D., J.C. Guatelli, M.D., P.A. Brooks, M.D., C.A. Kauffman, M.D., C.T. Pachucki, M.D., K.M. Neuzil, M.D., M.P.H., R.F. Betts, M.D., P.F. Wright, M.D., M.R. Griffin, M.D., M.P.H., P. Brunell, M.D., N.E. Soto, M.D., A.R. Marques, M.D., S.K. Keay, M.D., Ph.D., R.P. Goodman, M.D., D.J. Cotton, M.D., M.P.H., J.W. Gnann, Jr., M.D., J. Loutit, M.D., M. Holodniy, M.D., W.A. Keitel, M.D., G.E. Crawford, M.D., S.-S. Yeh, M.D., Ph.D., Z. Lobo, M.D., J.F. Toney, M.D., R.N. Greenberg, M.D., P.M. Keller, Ph.D., R. Harbecke, Ph.D., A.R. Hayward, M.D., Ph.D., M.R. Irwin, M.D., T.C. Kyriakides, Ph.D., C.Y. Chan, M.D., I.S.F. Chan, Ph.D., W.W.B. Wang, Ph.D., P.W. Annunziato, M.D., and J.L. Silber, M.D., for the Shingles Prevention Study Group*

ABSTRACT

BACKGROUND

The incidence and severity of herpes zoster and postherpetic neuralgia increase with age in association with a progressive decline in cell-mediated immunity to varicella–

The authors' affiliations are listed in the Appendix. Address reprint requests to Dr. Oxman at the Shingles Prevention Study

Zoster Vaccine

- Zostavax by Merck
- Licensed May 2006
- Live attenuated vaccine
- Indicated for prevention of zoster and post-herpetic neuralgia

Zoster Vaccine

- Indicated for persons 60 years old and older*
- Indicated for persons with current varicella immunity based on disease
- Indicated regardless of a history of zoster
- One dose, 0.6 cc subcutaneous injection

*Recent package insert change – 50 years old and older

Zoster Vaccine Criteria of Varicella Immunity

1. Laboratory evidence of immunity or laboratory confirmation of disease
2. Born in U.S. before 1980*
3. Health-care provider diagnosis of or verification of varicella disease
4. Health-care provider diagnosis of zoster

*Does not apply to health-care providers, immunosuppressed, or pregnant

Health-care Provider Screening: Zoster Vaccine

- Don’t Ask (about a history of varicella)
  - Screening for a history of varicella disease is not necessary or recommended
  - Persons 50 years of age and older can be assumed to be immune regardless of their recollection of chickenpox (so don’t ask)

Health-care Provider Screening: Zoster Vaccine

- Don’t Test (it will just cause you trouble)
- If tested and seronegative - 2 doses of single antigen varicella vaccine (Varivax®) separated by at least 4 weeks
- Zoster vaccine – not indicated for persons with immunity due to vaccine

Zoster Vaccine: Simultaneous Vaccination

- Package insert claims reduced immunogenicity of zoster vaccine when administered concomitantly with pneumococcal polysaccharide vaccine
- BUT: Zoster efficacy NOT based on immunogenicity

Zoster Vaccine: Simultaneous Vaccination

Zoster vaccine and pneumococcal polysaccharide vaccine can be administered simultaneously

Streptococcus pneumoniae

- Gram-positive bacteria
- 90 known serotypes
- Polysaccharide capsule important virulence factor
- Type-specific antibody is protective

Pneumococcal Polysaccharide Vaccine

- Not effective in children younger than 2 years
- 60%-70% against invasive disease
- Less effective in preventing pneumococcal pneumonia

Pneumococcal Polysaccharide Vaccine (PPSV23) Recommendations

Adults 65 years and older

Persons 19 years and older with

- Cigarette smoking
- asthma

Persons 2 years and older with

- chronic illness
- anatomic or functional asplenia
- immunocompromised (disease, chemotherapy, steroids)
- HIV infection
- environments or settings with increased risk
  - American Indian/Alaska Native 50 years old or older, if considered by local health to be at high risk

Pneumococcal Polysaccharide Vaccine Revaccination

- Routine revaccination of immuno-competent persons is not recommended
- Revaccination recommended for persons 2 years of age or older who are at highest risk of serious pneumococcal infection
- Single revaccination dose at least 5 years after the first dose

MMWR 1997;46(RR-8):1-24

Pneumococcal Polysaccharide Vaccine Candidates for Revaccination

Persons ≥2 years of age with:

- functional or anatomic asplenia
- immunosuppression
- transplant
- chronic renal failure
- nephrotic syndrome

Persons vaccinated at <65 years of age

MMWR 1997;46(RR-8):1-24

Tdap

Tdap reduces the risk of pertussis by 60% - 80%

Tdap approved ages

- 10 through 64 years for Boostrix
- 11 through 64 years for Adacel

Tdap not approved by the Food and Drug Administration for children 7 years through 9 years or adults 65 years or older

Wei SC et al. *Clin Infect Dis* 2010;51:315-21

Tdap Recommendations for Adolescents/Adults

Persons 11 through 64 years of age who have not received Tdap should receive a dose followed by Td booster doses every 10 years

Adolescents should preferably receive Tdap at the 11 to 12 year-old preventive healthcare visit

MMWR 2011; 60 (No. 1):13-5

New Tdap Recommendation for Adults

Persons 65 years old or older who anticipate or have close contact with an infant should receive a dose of Tdap if not already received

off-label recommendation. *MMWR* 2011; 60 (No. 1):13-5

New Tdap Recommendations for Adolescents

Persons 7 through 10 years of age who are not fully immunized against pertussis (including those never vaccinated or with unknown pertussis vaccination status) should receive a single dose of Tdap

off-label recommendation. *MMWR* 2011; 60 (No. 1):13-5

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"Not fully immunized"

- fewer than 4 doses of DTaP
- 4 doses of DTaP and last dose was prior to age 4 years

MMWR 2011; 60 (No. 1):13-5

Morbidity and Mortality Weekly Report

Updated Recommendations for Use of Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis (Tdap) Vaccine from the Advisory Committee on Immunization Practices, 2010

Despite sustained high coverage for childhood pertussis vaccination, pertussis remains poorly controlled in the United States. A total of 16,858 pertussis cases and 12 infant deaths were reported in 2009 (*1*; CDC, unpublished data, 2009). Although 2005 recommendations by the Advisory Committee on Immunization Practices (ACIP) called for vaccination with tetanus toxoid, reduced diphtheria toxoid and acellular pertussis (Tdap) for adolescents and adults to improve immunity against pertussis, Tdap coverage is 56% among adolescents and <6% among adults (*2,3*). In October 2010, ACIP recommended expanded use of Tdap. This report provides the updated recommendations, summarizes the safety and effectiveness data considered by ACIP, and provides guidance for implementing the recommendations.

ACIP recommends a single Tdap dose for persons aged 11

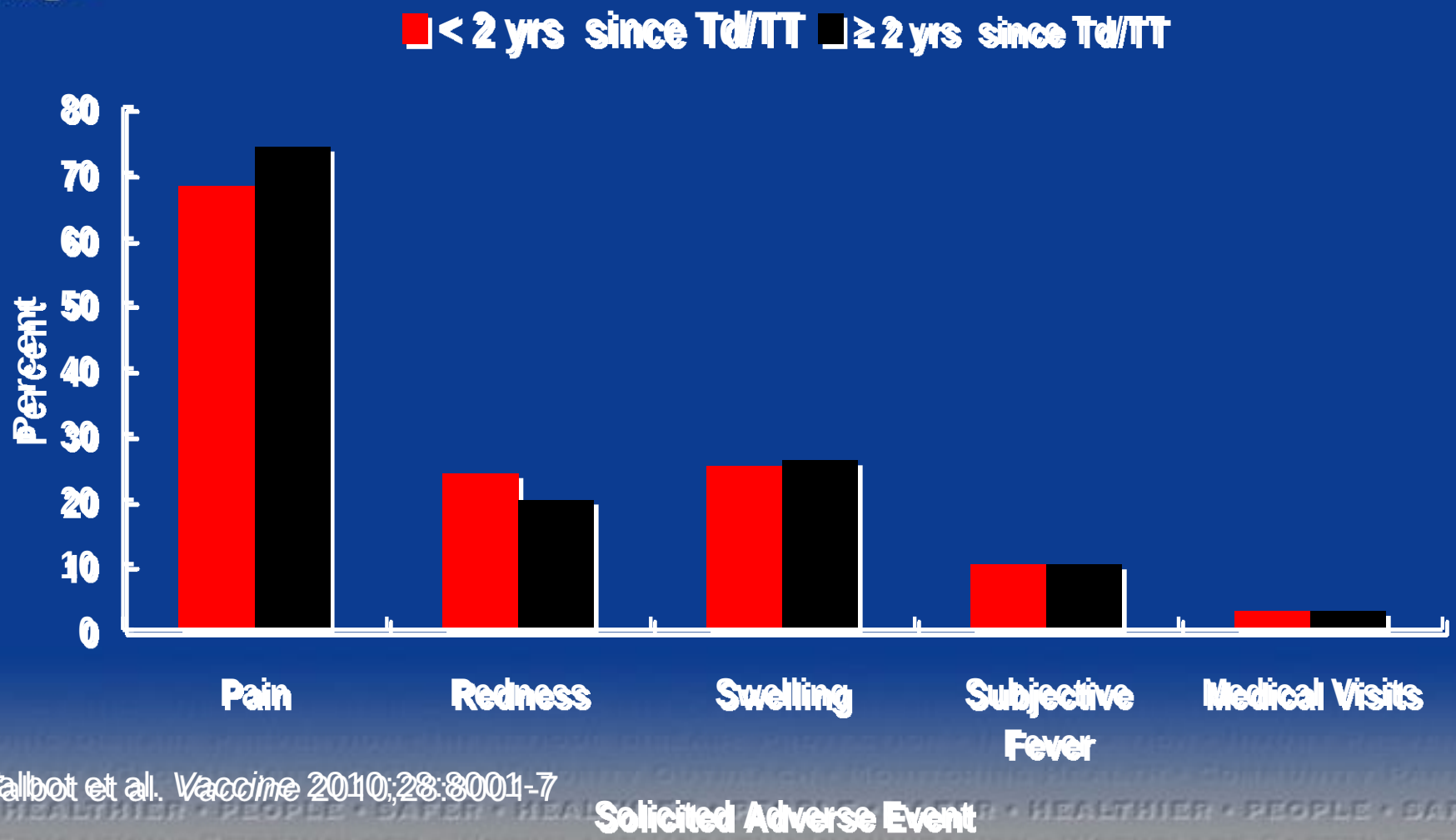
the United States, the additional recommendations are made to facilitate use of Tdap to reduce the burden of disease and risk for transmission to infants (Box).

Timing of Tdap Following Td

Safety. When Tdap was licensed in 2005, the safety of administering a booster dose of Tdap at intervals <5 years after Td or pediatric DTP/DTaP had not been studied in adults. However, evaluations in children and adolescents suggested that the safety of intervals as short as 18 months was acceptable (*6*). Rates of local and systemic reactions after Tdap vaccination in adults were lower than or comparable to rates in adolescents during U.S. prelicensure trials; therefore, the safety of using intervals as short as 2 years between Td and Tdap in adults

MMWR 2011; 60 (No. 1):13-5

Tdap Adverse Event Rates by Interval Since Previous Td/TT



Talbot et al. *Vaccine* 2010;28:8001-7

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New Tdap Interval Recommendations*

Tdap can be administered regardless of the interval since the last tetanus and diphtheria containing vaccine

ACIP concluded that while longer intervals between Td and Tdap vaccination could decrease the occurrence of local reactions, the benefits of protection against pertussis outweigh the potential risk for adverse events

*off-label recommendation. *MMWR* 2011; 60 (No. 1):13-5

Tdap and Healthcare Personnel (HCP)*

HCP, regardless of age, should receive a single dose of Tdap as soon as feasible if they have not previously received Tdap and regardless of the time since last Td dose

Post-exposure prophylaxis should be provided to HCP even if vaccinated, although observation for symptoms of pertussis an option if provider does NOT see hospitalized neonates or pregnant women

*off-label provisional ACIP recommendation. Approved by ACIP on Feb 23, 2011 – on CDC website

Thank You

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