Improving Adult Immunization Coverage in the US

September 6, 2013
8:00 AM – 9:15 AM
Princeton, New Jersey
Session 1: Improving Adult Immunization Coverage in the United States

Learning Objectives

1. Identify adult patients for appropriateness of administering vaccines based on current recommendations.
2. Act to increase provider recommendations to patients who should be vaccinated.
3. Implement standing orders for adult immunization within practice settings.

Faculty

**William Schaffner, MD**  
Chairman  
Department of Preventive Medicine  
Professor of Infectious Diseases  
Department of Medicine  
Vanderbilt University School of Medicine  
Nashville, Tennessee

William Schaffner, MD, is chairman of the department of preventive medicine as well as professor of infectious diseases in the department of medicine at the Vanderbilt University School of Medicine, Nashville, Tennessee. After undergraduate studies at Yale University in New Haven, Connecticut, Dr Schaffner attended the University of Freiburg, Germany, as a Fulbright Scholar. He received his medical degree from Cornell University Medical College and completed his residency at Vanderbilt University Medical Center, where he also undertook specialty training in infectious diseases. For 2 years he served as an epidemic intelligence service officer with the Centers for Disease Control and Prevention in Atlanta, Georgia, after which he returned to Vanderbilt.

Dr Schaffner’s primary interests are infectious diseases and their prevention. He has worked extensively on the effective use of vaccines and is a strong proponent of collaboration between academic medical centers and public health institutions.

Dr Schaffner is a past president of the National Foundation for Infectious Diseases and has served on the board of directors of the Infectious Diseases Society of America.

**Robert H. Hopkins Jr, MD, FACP, FAAP**  
Professor of Internal Medicine and Pediatrics  
University of Arkansas for Medical Sciences College of Medicine  
Little Rock, Arkansas

Robert H. Hopkins Jr, MD, FACP, FAAP, is professor of internal medicine and pediatrics at the University of Arkansas for Medical Sciences (UAMS) College of Medicine, Little Rock, Arkansas. He received his medical degree from the Medical College of Georgia in Augusta and served a residency in internal medicine-pediatrics at UAMS.

Dr Hopkins is an active clinician and educator who serves as the director of the division of general internal medicine and combined internal medicine-pediatrics residency program at UAMS. His professional and academic interests have focused on medical education, adult immunization, and evidence-based patient care; he has published more than 100 articles in these
disciplines. Within his local community, Dr Hopkins is a member of the Arkansas Department of Health Vaccine medical advisory committee. Nationally, he is a member of the executive committee of the National Influenza Vaccine Summit and of the American College of Physicians adult immunization advisory committee. Dr Hopkins frequently speaks locally, regionally, and nationally about issues related to vaccine-preventable disease and immunization.

M. Susan Burke, MD, FACP
Clinical Assistant Professor of Medicine
Thomas Jefferson University
Philadelphia, Pennsylvania

M. Susan Burke, MD, is a clinical assistant professor of medicine at Thomas Jefferson University in Philadelphia, Pennsylvania, an adjunct associate professor of geriatrics at the Philadelphia College of Osteopathic Medicine in Philadelphia, and a senior advisor at the Lankenau Internal Medicine Clinical Care Center, Wynnewood, Pennsylvania. Having earned her medical degree from the University of Pennsylvania Perelman School of Medicine (Philadelphia), she completed a residency in internal medicine at Lankenau Hospital (now the Lankenau Medical Center). Dr Burke is board certified in internal medicine and geriatrics and is a fellow of the American College of Physicians.

A 2-time recipient of the Osler-Blockley Award for Excellence in Clinical Teaching from Thomas Jefferson University, Dr Burke also has received the residents’ award for best teacher from the Lankenau Internal Medicine house staff. She has been named Best Doctor for Women (2005) and, more recently, Top Doctor (2006) by Main Line Today magazine. Dr Burke lectures nationally and has published chapters and articles in publications such as The Journal of the American Osteopathic Association and Annals of Long-Term Care on numerous primary care and geriatric topics, as well as in CD-ROM format.

**Faculty Financial Disclosure Statements**
The presenting faculty reports the following:

Dr Schaffner has received consultant honoraria from Dynavax, GlaxoSmithKline, and Pfizer. Dr Schaffner also has received honoraria from Merck & Co, Inc., and from Sanofi-Pasteur for being a member of Data Safety Monitoring Boards.

Dr Hopkins has no financial relationships to disclose.

Dr Burke has received speaker and advisory board honoraria from Merck & Co, Inc.; Dr Burke also has received advisory board honoraria from Iroko Pharmaceuticals, LLC.

**Education Partner Financial Disclosure Statement**
The content collaborators at Miller Medical Communications, LLC, report the following: Lyerka D. Miller, PhD, has no financial relationships to disclose.

**Suggested Reading List**


SESSION 1
8–9:15am

Improving Adult Immunization Coverage in the US

SPEAKERS
William Schaffner, MD
Robert H. Hopkins Jr, MD, FACP, FAAP
M. Susan Burke, MD, FACP

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Learning Objectives

• Identify adult patients for appropriateness of administering vaccines based on current recommendations
• Act to increase provider recommendations to patients who should be vaccinated
• Implement standing orders for adult immunization within practice settings

Adult Immunization

An Unexploited Opportunity for Prevention

William Schaffner, MD
Chairman
Department of Preventive Medicine
Professor of Infectious Diseases
Department of Medicine
Vanderbilt University School of Medicine
Nashville, Tennessee

Adult Immunization Concepts

■ The vast majority of vaccine-preventable diseases occur in adults
■ These diseases produce substantial morbidity and mortality
■ Vaccine coverage of adults is suboptimal, with notable disparities of race/ethnicity and income
■ Your advocacy for vaccines will benefit your patients

The Yearly Toll of Vaccine-Preventable Diseases

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

Burden of Vaccine-Preventable Diseases – 1

<table>
<thead>
<tr>
<th>Disease</th>
<th>20th Century Annual Morbidity</th>
<th>2010 Reported Cases</th>
<th>Percent Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smallpox</td>
<td>28,000</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Diphtheria</td>
<td>21,053</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Measles</td>
<td>530,217</td>
<td>61</td>
<td>&gt;99%</td>
</tr>
<tr>
<td>Mumps</td>
<td>162,344</td>
<td>2528</td>
<td>98%</td>
</tr>
<tr>
<td>Pertussis</td>
<td>290,752</td>
<td>21,291</td>
<td>98%</td>
</tr>
<tr>
<td>Polio (paralytic)</td>
<td>16,316</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Rubella</td>
<td>47,745</td>
<td>6</td>
<td>&gt;99%</td>
</tr>
<tr>
<td>Congenital Rubella Syndrome</td>
<td>152</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Tetanus</td>
<td>580</td>
<td>8</td>
<td>99%</td>
</tr>
<tr>
<td>Haemophilus influenzae</td>
<td>20,000</td>
<td>270</td>
<td>99%</td>
</tr>
</tbody>
</table>

Burden of Vaccine-Preventable Diseases – 2

Burden of Vaccine-Preventable Diseases – 3

Adult Vaccination Rates Too Low – 1

<table>
<thead>
<tr>
<th>Disease</th>
<th>United States/Annual Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUMAN PAPILLOMAVIRUS (HPV)</td>
<td>6.2 million new infections</td>
</tr>
<tr>
<td>Pertussis</td>
<td>Outbreaks throughout US adolescents and young adults</td>
</tr>
<tr>
<td></td>
<td>Most severe in infants</td>
</tr>
<tr>
<td></td>
<td>Source is usually an adult or older child</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Disease</th>
<th>United States/Annual Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHINGLES</td>
<td>1 (m) cases</td>
</tr>
<tr>
<td></td>
<td>Lifetime risk 30%</td>
</tr>
<tr>
<td></td>
<td>Incidence of shingles and postherpetic neuralgia increases with age</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Disease</th>
<th>United States/Annual Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;65</td>
<td>66%</td>
</tr>
<tr>
<td>50-64</td>
<td>40%</td>
</tr>
<tr>
<td>19-49</td>
<td>33%</td>
</tr>
<tr>
<td>HCW</td>
<td>65%</td>
</tr>
<tr>
<td>PNEUMOCOCCAL</td>
<td></td>
</tr>
<tr>
<td>&lt;65</td>
<td>62%</td>
</tr>
<tr>
<td>AA</td>
<td>48%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>43%</td>
</tr>
<tr>
<td>19-64 (high risk)</td>
<td>20%</td>
</tr>
<tr>
<td>TDAP</td>
<td>13%</td>
</tr>
</tbody>
</table>

AA, African American; HBV, hepatitis B virus.


INFLUENZA
- ≥65 66%
- 50-64 40%
- 19-49 33%
- HCW 65%

PNEUMOCOCCAL
- <65 62%
- AA 48%
- Hispanic 43%
- 19-64 (high risk) 20%
- TDAP 13%

HCW, health care worker; TDAP, tetanus, diphtheria, and pertussis.

Adult Vaccination Rates Too Low – 2

HPV
Women, 19-26 (≥1 dose) 30%

HERPES ZOSTER (shingles)
≥60
AA 16%
Hispanic 8%

Conclusions: Coverage remaining very low – tiny improvement since 2009 Racial/Ethnic disparities persist
An opportunity for improvement!

When It Comes to Vaccines, Doctors and Patients Aren’t Hearing One Another

Most physicians say:
‘I talk to all of my patients about vaccines’

87%

But few patients agree

“Yes, I regularly discuss vaccines with my health care provider”
18%

“I occasionally discuss vaccines with my health care provider”
31%

“I don’t recall ever discussing vaccines”
21%

BE AN ADVOCATE FOR VACCINATING YOUR ADULT PATIENTS!

Results are based on surveys by the National Foundation for Infectious Diseases. November 2010.

Reasons Why Patients Not Vaccinated

- Healthy, don’t think they need it
- Didn’t know about disease
- Didn’t know about vaccine
- Doctor didn’t recommend it

Adult Immunization: Case-Based Approach

Robert H. Hopkins, Jr, MD, FACP, FAAP
Professor of Internal Medicine and Pediatrics
University of Arkansas for Medical Sciences
College of Medicine
Little Rock, Arkansas

2013 Adult Schedule [Age-Based]

Recommended Adult Immunization Schedule – United States – 2013

Influenza

- Enveloped RNA virus
- 3 types based on surface Ag (HA, NA) + internal structure
  - A. Multiple hosts – birds, mammals (human). Many HA and NA
    - 'Highly Pathogenic Strains'
    - 'Mild Strains'
  - B. Human host–1 HA and 1 NA
  - C. Human host–Mild illness 'URI'
- Up to 50K influenza-associated deaths/year in United States
- 200+ associated hospitalizations, exacerbations
- >90K seasonal influenza M&M in people aged >65 years
- Multiple effective vaccines in United States

*Ag, antigen; M&M, monitored by and mortality; URI, upper respiratory tract infection

http://www.cdc.gov/flu/avian/gen/info/flu-virus.htm

US Influenza Vaccines

- IIV: ‘Inactivated’ and replaces ‘TIV’, IM administration ‘All corners’ 6 months+
  - Multiple vaccines varied indications [age, etc.], 2013-2014 most Trivalent—Limited supply of quadrivalent inactivated vaccine expected to be available
- Intradermal IIV [Approved May 2011 for 18-64 years—smaller needle]
- High-Dose IIV for 65+ population* [First available 2010-2011]
  - Same production as TIV, higher Ag content ** More local reactions
  - Phase 3 trials: Seroprotection, seroconversion rates >TIV for A,B strains
  - ‘Real world’ efficacy data not yet published
- New Cell culture vaccine approved 2013
- New Recombinant HA Vaccine approved 2013
- Higher HA content, no NA
- LAIV: Live attenuated/cold-adapted nasal.
  - Indicated only for healthy people 2-49 years
  - Inactivated influenza vaccine: IM, Intramuscular


Influenza Vaccine Priorities

<table>
<thead>
<tr>
<th>HEALTH CARE WORKERS</th>
<th>PATIENTS AT HIGHEST RISK OF SEVERE ILLNESS /TRANSMISSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>High risk for disease (symptomatic and asymptomatic)</td>
<td>Pregnant women</td>
</tr>
<tr>
<td>High risk for transmission</td>
<td>Newborns and children</td>
</tr>
<tr>
<td>If sick, not available to provide healthcare</td>
<td>Older adults</td>
</tr>
<tr>
<td>Medical comorbidities, including obesity</td>
<td>Medical workers</td>
</tr>
<tr>
<td>Household contacts of high risk</td>
<td>Long-term care, institutionalized, crowded living conditions</td>
</tr>
</tbody>
</table>

*Vaccine indicated in all >6 months of age wanting to prevent flu


Influenza ‘Nuts and Bolts’

- IIV: 1 dose for adults
  - incl. QIV, TIV, sQIV, hTIV, LAIV, ccTIV, rHA (Flublock)
  - Kids <9 years, first vaccine season: 2 doses 4+ weeks apart
  - LAIV can be safely used in MOST health care settings as alternative to TIV
- Egg allergy: ACIP, AAAI: NO contraindication
  - Anaphylaxis EXCEEDINGLY rare [*1 in 4 million doses]
  - History is key: Hives/higher risk, consider allergy referral
  - Risk/benefit of disease vs vaccine > usually favors vaccine...
  - When vaccinating egg-allergic, observe in office ~ 30 minutes

AAAI: Academy of Allergy and Immunology; ACIP, Advisory Committee on Immunization Practices; HA, hemagglutinin human albumin.


Pneumococcal Polysaccharide

- >2000 adults aged 65+ years die of invasive pneumococcal disease each year
- Traditional vaccine is purified capsular polysaccharide
  - 23 types—cause of 88% bacteremic PNC disease
  - 60%–70% efficacy vs invasive disease
  - Does not prevent pneumonia
  - Immunity lasts at least 5 years following 1 dose
  - Local reactions—only common AE

All adverse event: PNC, pneumococcal

PCV13 Vaccine in Adults NEW 2012

- Routine PCV13 in US infants since 2010
- 2010 FDA approved + ACIP recommended
- All children 6 weeks – 11 months [Series – another talk…]
- December 30, 2011 FDA approves for adults:
  - Prevention of pneumonia and IPD ≥50 years
  - Based on immunogenicity studies [not clinical efficacy]
  - Safety in ~6000 adults similar to PPSV23
- June 20, 2012 [Published October 12, 2012] ACIP recommends PCV13 in adults:
  - Immune compromised adults ≥19 years + CSF leak/cochlear implant
  - Best practice PCV13 should be administered before PPS23
  - 1 Booster in children 6-18 years with immune compromise

CSF: cerebrospinal fluid; IPD: invasive pneumococcal disease.


Pneumococcal Recommendations

- PPS23 [1 dose, boost at 65] is recommended for:
  - Adults aged 65+ years
  - Cigarette smokers (since 2009)
  - Chronic conditions:
    - Diabetes
    - Heart, lung, liver, kidney disease
      - Including asthma (since 2009)
    - Immunocompromised (PCV13+PPS since 2012)
    - Disease-based: Solid tumor, hematologic malig, myeloma, HIV...
    - Iatrogenic: Steroids, organ transplants, BMT...
    - Anatomic/functional asplenia (Sickle cell, etc.) (PCV13+PPS since 2012)
    - CSF leak, cochlear implant (PCV13+PPS since 2012)

BMT: bone marrow transplant; HIV: human immunodeficiency virus.


PCV13 Recommended in Adults With:

- Solid Organ Transplants
- Multiple myeloma
- Hematologic malignancy [leukemia, lymphoma, Hodgkin’s]
- General Malignancy
- ESKD, Nephrotic Syndrome
- Sickle Cell, hemoglobinopathy
- HIV
- Immunosuppression/Immunodeficiency
- Not-immune-compromised
  - CSF leak, Cochlear implant

ESKD: end-stage kidney disease.


PCV13 Vaccine in Adults NEW 2012

- Pneumococcal (PPS23) vaccine-naïve patients:
  - Adults ≥19 yrs with immunocompromise, CSF leak/cochlear implant
  - PCV13 FIRST followed by PPS23 at least 8 weeks later
  - Booster PPS23 in 5 years
  - AND boost PPS23 after 5 years PLUS 65+ years old
- Previously PPS23-vaccinated subjects:
  - Adults ≥19 yrs with immunocompromise, CSF leak/cochlear implant
  - PCV13 should be given 1+ years AFTER PPS23
  - Booster PPS23 in 5 years
  - AND boost PPS23 after 5 years PLUS 65+ years old


HPV

- More than 200 types of the virus identified to date
  - 30+ HPV types infect the human genital tract
  - HPV-16 and HPV-18 are the most common oncogenic HPV types, associated with cervical, anal, penile, and oropharyngeal malignancies
  - HPV 6 and HPV-11 are associated with genital warts and respiratory papillomatosis
- Very common infection; at least 50% of sexually active men and women infected with HPV during lifetime
- Malignancies associated with persistent infection; HPV is responsible for:
  - 99% of cervical cancers and cervical dysplasia
  - 13% to 74% of malignancies in the oral cavity
  - 50% of penile and vaginal cancers
  - 80% to 95% of anal cancers
- 25,000 HPV-associated cancers in United States annually

HPV Vaccines

<table>
<thead>
<tr>
<th>HPV4</th>
<th>HPV2</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPV Types 6, 11, 16, and 18</td>
<td>HPV Types 16 and 18</td>
</tr>
</tbody>
</table>

- Prevention of cervical, vaginal, and vulvar cancers and precancerous lesions in females aged 9 to 26 years
- Prevention of genital warts in males and females aged 9 to 26 years
- Prevention of anal cancers in males and females aged 9 to 26 years
- Prevention of anal intraepithelial neoplasia (AIN) in males and females aged 9 to 26 years

ACIP Recommendations: HPV4 and HPV2 for females aged 11 or 12 years (approved for ages 9-26) and HPV4 for males aged 11 or 12 years (approved for ages 9-26).

Contraindications/Cautions: Local reaction, bronchospasm reported; not recommended in pregnancy.

HPV Vaccine Does Not Substitute for Cervical Cancer Screening


Tdap Recommendations

- Single dose to replace 1 dose Td for all adults
- 2009 added 65+
- 2012 Booster dose with each pregnancy
- Current recommendation for subsequent Td q10yr
- May be given (anytime) ≤10 years following last Td
  - As little as 2 years demonstrated safe/effective
- Special emphasis
  - Adults with close infant contact: (health care workers, parents, child care workers, etc)
- To follow primary T series (DTaP, DTP, DT, or Td)
  - Or as part of primary series

Herpes Zoster – Shingles

- Most who have varicella have measurable Ab for life
- Zoster (shingles) occurs when CMV surveillance declines
  - Reactivation or varicella exposure re-stimulates CMI
  - Cycle can repeat
- Lifetime risk of shingles ~33% (increases with age)
  - 99.5% adults have serologic evidence of prior varicella
  - At 85—lifetime risk ~50%
- Postherpetic neuralgia (PHN) is the most common complication
  - Occurs in up to one-third of patients with shingles
  - Pain ranges from mild to excruciating
  - More common if >70 years, immunocompromised
- Vaccination stimulates CMI and decreases zoster

CMV, cell mediated immunity


Zoster Vaccine

<table>
<thead>
<tr>
<th>VACCINE</th>
<th>LIVE ATTENUATED VIRUS VACCINE</th>
</tr>
</thead>
</table>

ACIP Recommendation Healthy adults aged 60+ years, regardless of prior history of zoster

FDA Indication Healthy adults aged 50+ years

Other Recommendations

- ACIP: administer before initiating biologic DMARDs

Contraindications

- Pregnancy
- Anaphylactic hypersensitivity to neomycin or gelatine
- Known severe immunodeficiency

Other Considerations

- No need to defer for ‘at-risk contacts’ – transmission risk low
- No need to defer if recent transfusion, Ab-containing products

Adverse Events

- Occasional mild varicella-like rash at vaccine site
- Rare cases of encephalopathy

Frozen Powdered Vaccine

- Must be administered within 60 minutes of reconstitution
- 0.65 mL subcutaneous depot

Duration of Protection

- At least 4 years
- No booster recommended

ACR, American College of Rheumatology; DMARD, disease-modifying anti-rheumatic drug.


Td/Tdap

- Recommendation
  - All adults should have a primary tetanus, diphtheria series, followed by a Td ‘booster’ every 10 years
  - Replace 1 dose Td with Tdap
  - Many adults aged ≥60 years never received primary Td series
    - Primary series includes: 3 doses at 0, 1 month, 6 months
    - Results in protective Ab in nearly all, duration 10 yrs+
  - Many adults do not receive Td boosters
    - More than 50% of adults do not have protective Td Ab’s
    - Most boosters given are ‘episodic trauma-related’
- Td/Tdap Contraindications
  - Severe allergy to vaccine components or Arthus Reaction following T vax
  - (Tdap) Encephalopathy ≤7 days after pertussis-containing vaccine
  - (Tdap) Unstable neurologic disease, moderate-severe acute illness

Ab, antibody; ‘T’, Td; Td vaccine; Td, tetanus diphtheria toxoid.

MMR, Varicella

- Live virus vaccines, 2-dose vaccine series
  - Contraindications: Immune compromise
  - MMR: Egg allergy
  - VAR: Neomycin, gelatin allergy
- Routinely recommended in children
  - Most born before 1957 immune to measles, mumps, rubella
  - Most born before 1980 immune to varicella
- Risk groups
  - HEALTH CARE WORKERS
  - Education, day care, institutional employees
  - Women of childbearing age
  - Vaccinate prepuberty or postpartum
  - International travel/adooption

Hepatitis B Recommendations

<table>
<thead>
<tr>
<th>Category</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diabetes mellitus</strong></td>
<td>Chronic liver disease, including chronic HCV</td>
</tr>
<tr>
<td><strong>End-stage renal disease</strong></td>
<td>Chronic liver disease, including dialysis patients (high-dose vaccines)</td>
</tr>
<tr>
<td><strong>Recipients of clotting factors</strong></td>
<td>Alaska and Pacific Islanders natives</td>
</tr>
<tr>
<td><strong>HIV</strong></td>
<td>≥ 1 sexual partner/6 mos, MSM, STD clinic patients</td>
</tr>
<tr>
<td><strong>Household and sexual contacts of HBV patients</strong></td>
<td>Health care workers</td>
</tr>
<tr>
<td><strong>Travelers to endemic areas and internationally adoptive families</strong></td>
<td>Current or recent injection-drug users</td>
</tr>
<tr>
<td><strong>Correctional facility inmates and staff, developmental disability facility patients and staff</strong></td>
<td>Any person seeking protection from HBV infection</td>
</tr>
</tbody>
</table>

HCV, HBV, Hepatitis C virus; MSM, men who have sex with men; STD, sexually transmitted disease.


Meningococcal

- Highly contagious gram-negative bacterial infection
  - Highest mortality in children aged <1 year
  - Children aged 11 to 12 years, pre-college 'catch up'
  - Selective adult recommendation based on risk
- 3 Current vaccines: A, C, Y, W-135 (no type B vaccines)
  - MPS4: Polysaccharide vaccine (subcutaneous, 1 dose +7booster)
  - Available since 1978, fair efficacy, OK if conjugate not available
  - MCV4 [2 products]: Conjugate vaccines (intramuscular, 1 dose)
  - Approved 2005, 2010
  - Preferred for primary vaccination
  - Booster may be given selectively after 5 years if high risk persists

Meningococcal Indications

- All children aged 11 to 12 years
- College freshmen who will live in a dormitory
- Who have not been vaccinated previously
- Asplenia (anatomic or functional)
- Terminal complement deficiencies
- HIV
- Best response if CD4 >200
- Travelers to ‘at-risk areas’: Sub-Saharan Africa, December through June
  - Required for entry into Saudi Arabia/Mecca during Hajj
- Microbiologists with potential occupational meningococcal contact

Meningococcal conjugate vaccine quadrivalent; MPS4, meningococcal polysaccharide vaccine quadrivalent.


Hepatitis A, B

- Vaccination currently recommended in all US children
  - Hepatitis A (2007)
  - Hepatitis B (1995)
- Both have selective recommendations for adults
  - NEW Recommendation: Diabetes
  - Do NOT need to start over if completion of series is delayed
    - Can be given individually or together (combination vaccine)
  - HBV: 2 doses at 6+ month interval
    - Dose and alternate regimen are different for hemodialysis patients
    - Combination: 3 doses at 0, 1 month, 6 months
    - Accelerated Combination: 4 doses at 0, 7 days, 21-30 days, booster at 1 year
      - NEW 2009

Special Populations

- Preoperative consult
  - Meningococcal, PCV13 + PPS23 — pre-splenectomy
  - PCV13 + PPS23 — pre-cochlear implant
- Hospitalized medical patients
  - Influenza (in season), pneumococcal year-round
  - Tdap and influenza prior to L&D discharge (family??)
- Immunocompromised
  - Prednisone 20 mg/d equivalent
  - HIV CD4 <200
  - Biologic immunomodulators
  - Maximal 'non-live' vaccination
  - No recommendation for live vaccines
- Travel [CDC Yellow Book +/- Travel Clinics]

Practical Strategies to Increase Immunization of Adults in Your Practice

M. Susan Burke, MD, FACP
Clinical Assistant Professor of Medicine
Thomas Jefferson University
Philadelphia, Pennsylvania

Why Do We Want to Improve Vaccination Rates?

- More adults living longer
  - In United States, 10,000 turn 65 years old every day*
- Help keep our patients healthy
  - Focus on prevention: heart disease, cancer screening, immunizations
  - Vaccination is quality-of-care issue that improves health outcomes and will be monitored by health insurers/government in future
- Reduce morbidity and mortality
- Offices that vaccinate adults receive reasonable compensation
- It's the right thing to do


Successful Vaccines: Polio

Vaccine Opportunities – Pertussis

Reported Case Profiles, 2012 By Age, Weeks 1-52

<table>
<thead>
<tr>
<th>Age</th>
<th>No. of Cases</th>
<th>%</th>
<th>Age Inc /100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 year</td>
<td>4516</td>
<td>10.6</td>
<td>113.0</td>
</tr>
<tr>
<td>1-6 years</td>
<td>7012</td>
<td>17.5</td>
<td>30.1</td>
</tr>
<tr>
<td>7-10 years</td>
<td>8349</td>
<td>19.9</td>
<td>51.2</td>
</tr>
<tr>
<td>11-19 years</td>
<td>12484</td>
<td>29.8</td>
<td>53.6</td>
</tr>
<tr>
<td>20+ years</td>
<td>8800</td>
<td>21.2</td>
<td>3.89</td>
</tr>
<tr>
<td>Unknown</td>
<td>329</td>
<td>0.80</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>41880</td>
<td>100.0</td>
<td>13.3*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Deaths††</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants, aged &lt;3 months:</td>
<td>13</td>
</tr>
<tr>
<td>Infants, aged 3-13 months:</td>
<td>2</td>
</tr>
<tr>
<td>Children, 1-4 years:</td>
<td>2</td>
</tr>
<tr>
<td>Adults, aged 55+ years:</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
</tr>
</tbody>
</table>

*Total age incidence per 100,000 calculated from 41,551 cases with age reported.
††10 of the 18 deaths were female.
So How Do We Improve Vaccination Rates in Our Practices?

- Know the rules
- Establish protocols/standing orders
- Make strong recommendations
- If your office cannot vaccinate, then refer
- You are captain of the immunization ship!

Protocols/Standing Orders

- Utilize EMR to your advantage
  - Use the automatic reminders
  - Some can run the daily patient list for immunizations that are due; have staff administer on arrival
- Get your staff involved
  - Have them ask about vaccination status when doing vital signs
  - They can provide vaccine information to patient
  - Establish standing orders for automatic administration of other vaccines, not just flu
- Free download of standing order forms at www.immunize.org/standing-orders

EMR, electronic medical records systems.

Make Strong Recommendations

- Your recommendation is key
  - 88% of consumers said they were likely to get vaccinated if recommended by their doctor*
- Make education materials available—wall posters, vaccine information sheets
- Encourage dialogue, answer questions
- Personalize the vaccine experience
  - Would you take the vaccine yourself or give it to your parents? If so, let the patient know.

If Your Office Cannot Vaccinate, Then Refer

- My office does not provide all services to all patients, either
  - I vaccinate, but refer other services when needed
    - Colonoscopy, etc., per guideline recommendations
  - If you are following guidelines for other diseases, you should follow immunization recommendations as well, whether through your office or through referral to others

Barriers

- "But I'm too busy after taking care of all the other diseases I have to address"
  - What makes immunizing your patient less important than other disease issues?
- Turn your office immunizations into a Cinderella story!
- You don’t have to do it alone—engage the staff; have standing orders, refer to others

Barriers

- "But it's too costly to give or stock all these vaccines"
  - Reimbursement for adult vaccines better than for pediatric ones
  - Can bill $30-$96 above vaccine cost in addition to vaccine administration cost per vaccine
    - Example: administration of 21 zoster vaccines and 32 pneumococcal vaccines gained additional $4,487.65 in net practice revenue, annualized to ~ $27K net profit* 
  - Many companies will provide vaccines up to 90 days before payment is due—can bill for them by then!!
  - Most companies will buy back outdated/damaged product or freezer failures

If You Can’t Vaccinate, Then Refer

- Health centers, travel clinics, ID specialists all stock vaccines
- Growing number of pharmacies offer vaccinations
  - All states have some vaccinating pharmacies
  - Often better access with expanded evening and weekend hours
  - Patients visit their pharmacy more frequently than they do their doctor!

*Personal communication with practice manager in Kennett Square, Pennsylvania. March 2013.

Polio:
Prevented Through Vaccination

You can change the course of your patient's destiny...
Pertussis: Prevent or Modulate Disease Through Vaccination

Reported Case Profiles, 2012 by Age,
Vaccine 1-52

<table>
<thead>
<tr>
<th>Age</th>
<th>No. of Cases</th>
<th>%</th>
<th>Age Incidence /100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 year</td>
<td>653</td>
<td>10.8</td>
<td>112.0</td>
</tr>
<tr>
<td>1-4 years</td>
<td>7912</td>
<td>17.5</td>
<td>30.1</td>
</tr>
<tr>
<td>5-14 years</td>
<td>8249</td>
<td>19.9</td>
<td>51.2</td>
</tr>
<tr>
<td>15-19 years</td>
<td>12446</td>
<td>28.9</td>
<td>55.4</td>
</tr>
<tr>
<td>20+ years</td>
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<td>3.88</td>
</tr>
<tr>
<td>Unknown</td>
<td>328</td>
<td>0.81</td>
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<tr>
<td>Total</td>
<td>71582</td>
<td>100.0</td>
<td>15.7</td>
</tr>
</tbody>
</table>

2012 Reported Pertussis Deaths

<table>
<thead>
<tr>
<th>Age</th>
<th>Deaths**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants, aged 0-1 months</td>
<td>11</td>
</tr>
<tr>
<td>Infants, aged 2-5 months</td>
<td>1</td>
</tr>
<tr>
<td>Children, 6-11 years</td>
<td>1</td>
</tr>
<tr>
<td>Adults, aged 12+ years</td>
<td>2</td>
</tr>
</tbody>
</table>

*Data reported through NACI 12/6/12
**Of other 69 deaths were unknown


Zoster: Prevent or Modulate Disease Through Vaccination

Flu and Pneumonia: Prevent or Modulate Disease Through Vaccination

Make Immunizations a Priority: (What’s Not to Like?)

- Better patient care
- More patients into your office
- Primary prevention opportunity
  - Reduce morbidity and mortality
- More revenue for your practice

Final Thoughts

Give All Your Patients the Best Fighting Chance Against Vaccine-Preventable Diseases!