Vaccines, Not Just for Babies

Meg Fisher, MD
Medical Director

Disclosures

• I have no relevant financial relationships with the manufacturers of any commercial products or commercial services discussed in this CME activity
• I do intend to discuss unapproved uses of vaccines

Rationale

• Adolescent immunization rates are lower than those of babies and infants
• Adult immunization rates are even lower
• Healthcare worker rates of immunization are not much better than the public
• We should be setting the example!

Objectives

• Discuss current recommended vaccines for adolescents
• Discuss current recommended vaccines for adults
• Ensure that you and your staff receive the appropriate immunizations

Immunization

• Public health success story for children
• Rates of all vaccine preventable illnesses have plummeted: smallpox, diphtheria, tetanus, polio, measles, mumps, rubella, *Haemophilus influenzae* type b almost gone in the US
• However, many adults and adolescents are not receiving recommended doses

Test your knowledge

Identify these infections
Vaccine Preventable Diseases


2015 Red Book. Active immunization
Hepatitis B

- Universal, starting at birth
- All providers with blood exposure
- Three doses: 0, 1, 6 mo
- Titers to prove response to vaccine
- If < 10 mIU/ml, repeat series and titer
- Older less likely to respond

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/hepb.html

Exposure to HBsAg + Blood

- Immune: education re preventing exposures
- Non-responder or not immunized: HBIG plus education re preventing exposures
- Immunized but not tested: test and give HBIG if negative

Hepatitis B Vaccine

- New dilemma: Adolescents immunized as children may have low or no antibody levels at entry to college, nursing schools, medical schools
- Consider giving one dose and repeat titer
- If negative, finish the series and repeat titer

Rotavirus

- 55,000 - 70,000 Hospitalizations
- 205, 272,000 ED visits/410,000 OPD visits
- 2.7 million episodes

Vaccines

- RotaShield: rhesus tetravalent reassortant, licensed 1998, withdrawn 1999
- RotaTeq (RV5): human, bovine reassortant, licensed 2006
- Rotarix (RV1): attenuated human strain, monovalent, licensed 2008
**Recommendations**

- Universal for infants: 2 or 3 doses
- First dose must be given at 6 to 13 weeks (prior to time when intussusception peaks)
- No catch up for children or adults

[www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/rotavirus.html](http://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/rotavirus.html)

**Diphtheria, Tetanus and Pertussis: DTaP, Tdap**

- DTaP: universal immunization for infants and children: 2, 4, 6, 15-18 mo, 4-6 yr
- Tdap: booster for adolescents and adults

**Tdap: Boostrix, Adacel**

- Tetanus, diphtheria, pertussis booster
- For teens and adults
- Licensed in spring 2005
- Alter epidemiology and protect infants
- Protect yourself and your staff

[www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/tdap-td.html](http://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/tdap-td.html)

**Targeted adults**

- Anyone caring for young infants
- Cocoon the infants by immunizing contacts
- Healthcare people
- Pregnant women in late 2nd, 3rd trimester
- Give to the entire household, preferably before delivery

**Haemophilus influenzae type b**

- Disease almost gone in US
- Conjugate vaccine eliminates carriage
- Universal immunization: 2, 4, 6, 12-15 mo
- Rarely needed in adults


**Streptococcus pneumoniae**

- Dramatic decrease in US since PCV7
- Decrease in adult disease as well
- PCV13 now replaces PCV7
- Universal: 2, 4, 6, 12-15 mo
- Polysaccharide vaccine PPSV23 expands protection for high risk children and adults

**Child Risk Factors**

- Asplenia, HIV, CSF leak, cochlear implant
- Chronic illnesses: heart, lung, diabetes, renal failure, nephrotic syndrome, congenital immunodeficiency, treatment with immunosuppressive therapy

[www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/pneumo.html](http://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/pneumo.html)

**Adult Risk Factors**

- Smoker, asthma
- Asplenia, HIV, CSF leak, cochlear implant
- Chronic illness: heart, lung, diabetes, alcoholism, liver, immunodeficiency, renal failure, nephrotic syndrome, malignancy, immunosuppressive drugs, transplants

[www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/pneumo.html](http://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/pneumo.html)

**Polioviruses**

- Three types: type 2 eliminated!
- US - inactivated polio vaccine since 2000
- Universal: 2, 4, 6-18 mo, 4-6 years
- Adults rarely need immunization
- But, new travel recommendations

2015 Red Book. Poliovirus infections
[www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/polio.html](http://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/polio.html)

**Influenza**

- All people 6 months of age and older
- Healthcare personnel: mandates recommended by IDSA, PIDS, AAP +
- Formulated yearly on best guess
- Two A strains, one or two B strains
- Start when you get it and continue all season

2015 Red Book. Influenza
[www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/flu.html](http://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/flu.html)

“I had a little bird.
His name was Enza.
I opened the window.
And in flew Enza.”

A chant popular during the influenza pandemic of 1918
Measles, Mumps, Rubella
- Measles and rubella no longer endemic in the US, but imported measles increased
- Travelers should be immune
- Mumps outbreaks, colleges
- MMRV combination – more fever
- We should be immune: born before 1957, + titer or received 2 doses of vaccine
  www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mmr.html

Varicella Vaccine
- Prevents serious illness
- Outbreaks persist
- Second dose now recommended for all
- Routine at 4-5 years, MMRV
- Catch up for older
  2015 Red Book: Varicella
  www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/varicella.html

Zoster vaccine
- Zostavax
- Approved May 2006
- Age 60 and above; now 50 and above
- Protect yourself when the time comes
  www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/shingles.html

Hepatitis A Vaccines
- Inactivated
- Two doses, 6 months apart
- Prior to 2006: only for at risk or living in a high incidence state
- Now: at risk and all children at age 1
- Catch up is reasonable for all
  2015 Red Book: Hepatitis A
  www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/hepa.html

HPV Vaccines
- Virus-like particles genetically engineered
- Quadrivalent, 9 valent and bivalent
- Well tolerated and immunogenic
- Three dose series
- Universal for girls and boys
  2015 Red Book: Human papillomaviruses
  www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/hpv.html

Gardasil (Merck)
- Quadrivalent types 6, 11, 16, 18
- 9 valent types 16, 18, 31, 33, 45, 52, and 58
- Immunogenic in girls and boys
- 100% effective against persisting infection
- Licensed for females + males age 9 to 26 yr
- Now recommended for both girls and boys!
  www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/hpv.html
Cervarix (GSK)
- Types 16 and 18
- Immunogenic and effective in females
- Licensed for females age 9 to 26 yr
- Not studied in boys
- Novel production: baculovirus vector
- Novel adjuvant: ASO4

Meningococcal vaccines
- Polysaccharide vaccine rarely used today
- Conjugate vaccines recommendation:
  Universal age 11-12, booster age 16
  Highest risk: start in infancy, initial 2 doses,
  booster q 5 years
- Serogroup B vaccines: high risk and outbreaks

Suggested Changes
- I will ensure I am fully immunized
- I will encourage my staff to be fully immunized
- I will remind the parents of my patients that they need immunizations

Websites
- www2.aap.org/immunization
- www.healthychildren.org
- ww.cdc.gov/vaccines/acip/index.html
- www.cdc.gov/vaccines
- www.fda.gov/BiologicsBloodVaccines

Smiling is a contagious condition!