


Immunizations 2008: Updates,
Strategies, and Research


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Disclosures

- No financial conflict or interest with the manufacturer of any product named during this course.




Disclosures

- I will not present the use of any vaccine in a manner inconsistent with the label
- I will discuss drugs currently under investigation




Overview

- 2008 Childhood/adolescent schedule
- 2007-08 Adult schedule
- Influenza season
- Measles outbreaks
- Zoster vaccine
- Combination vaccines
- Immunization Strategies
- Future Vaccines
- General Recommendations



Vaccine Shortages

- **PedvaxHib – expected to continue until 4th quarter of 2008 or 1st quarter of 2009**
- **ProQuad – expected to continue until 1st quarter of 2009**
- **Rabies vaccine – supply expected to improve during mid-2008**
- **Japanese Encephalitis vaccine – restricted purchase**




2008-2009 Influenza Season




Influenza Season 2008-2009

- Recommended Groups for Vaccination
- Anyone who wants influenza vaccine
- Children 6 months – 18 years of age (5 years – 18 years if feasible)
- Healthy adults 50 years old and older
- Persons 5 – 49 years old at high risk for complications
- Pregnant women
- Residents of chronic care facilities
- Household contacts of persons at high risk for complications
- Health care workers




Influenza: High Risk for Complications

- Birth through 59 months of age
- Adults 50 years old and older
- Chronic lung disease, asthma
- Chronic heart disease
- Metabolic diseases, e.g. diabetes
- Sickle-cell disease and thalassemias
- Chronic renal disease
- High risk of aspiration
- Immunosuppression
- Pregnancy
- Chronic aspirin therapy: 18 years old and younger




2008-2009 Influenza Vaccine

- A/Brisbane/10/2007 (H3N2)
- A/Brisbane/59/2007 (H1N1)
- B/Florida/4/2006 (Yamagata lineage)




Inactivated Influenza Vaccines Available in 2008-2009

Vaccine	Package	Dose	Age	Thimerosal
Fluzone (sanofi pasteur)	Multidose vial*	Age-dependent	≥6 mos	Yes
	Single dose syringe*	0.25 mL	6-35 mos	No
	Single dose syringe and vial*	0.5 mL	≥36 mos	No
Fluvirin (Novartis)	Multidose vial	0.5 mL	≥4 yrs	Yes
Fluarix (GSK)	Single dose syringe	0.5 mL	≥18 yrs	Trace
Flulaval (GSK)	Multidose vial	0.5 mL	≥18 yrs	Yes
Afluria (CSL)	Single dose syringe	0.5 mL	≥18 yrs	Trace
	Multidose vial	0.5 mL	≥18 yrs	




Live Attenuated Influenza Vaccine (FluMist®)

- Approved only for healthy persons 2 years through 49 years of age who are not pregnant
 - healthcare personnel (except those working with hospitalized HSCT patients)
 - persons in close contact with high-risk groups
 - persons who want to reduce their risk of influenza




Live Attenuated Influenza Vaccine (FluMist®)

- Now refrigerator stable
- (35-46 degrees Fahrenheit)
- Smaller volume (0.1 cc per naris)



In the 2006 National Health Interview Survey, only 42% of healthcare workers reported receiving influenza vaccine in the previous 12 months.


MMWR 2007;56(RR-6):1-54

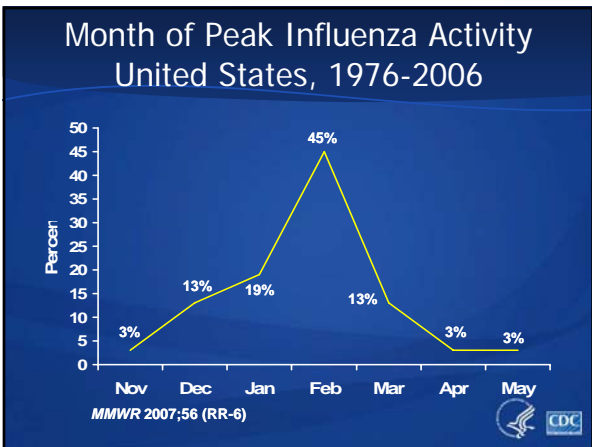


Influenza Vaccination of HCPs

- Educate HCPs about the benefits of vaccination for themselves, their families, and their patients
- Educate staff about vaccine adverse reactions
- Provide free vaccine at the work site to all employees, including night and weekend staff


MMWR 2006;55(RR-2)






Timing of Influenza Vaccine Programs

- Influenza activity can occur as early as October
- In more than 80% of seasons since 1976, peak influenza activity has not occurred until January or later
- In more than 60% of seasons the peak was in February or later




Timing of Influenza Vaccine Programs

- Providers should begin offering vaccine soon after it becomes available, if possible by October
- To avoid missed opportunities for vaccination, providers should offer vaccine during routine healthcare visits or during hospitalizations whenever vaccine is available




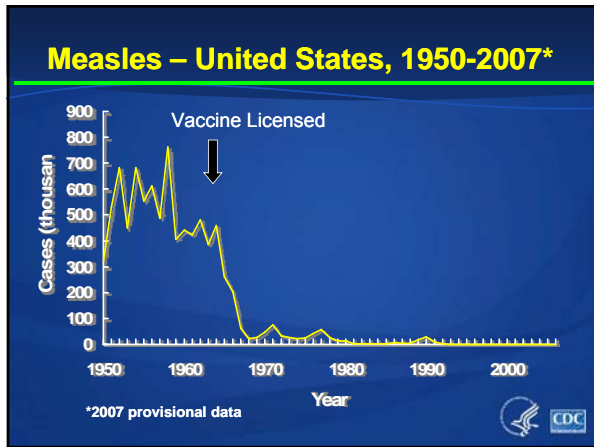
Timing of Influenza Vaccine Programs

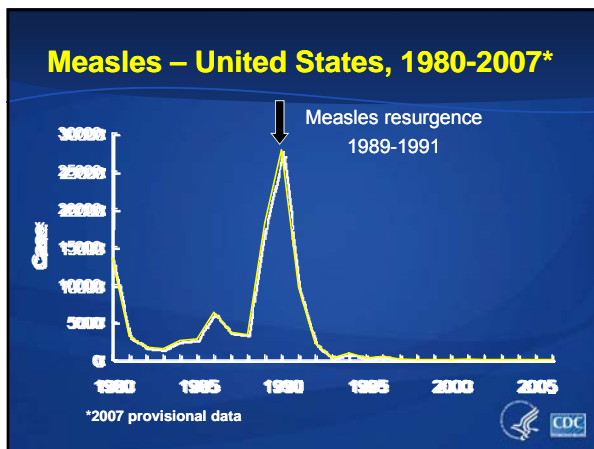
- Persons planning organized vaccination campaigns should consider scheduling these events after at least mid-October
- Scheduling campaigns after mid-October will minimize the need for cancellations because vaccine is unavailable
- Continue to offer influenza vaccine in December
- Providers should continue to vaccinate throughout influenza season



Measles







Measles–United States, 2008

- 127 cases reported from 15 states, DC and NYC*
- 87% imported or linked to imported case
- 19% younger than 12 months of age (10 others 12 to 15 months)
- Only 6 cases had documentation of vaccination
 - many (40%) unvaccinated because of religious or personal beliefs
- 17% exposed in a healthcare setting

MMWR 2008;57(No.18):494-8 and CDC unpublished data
*as of July 3, 2008



Measles 2008

- Measles has been imported from Switzerland, Israel, Belgium, Italy, Germany, India, China, Pakistan, the Philippines, and Russia
- All international travelers should have evidence of measles immunity
- CDC recommends measles/MMR vaccination of 6-11 month old children traveling outside the United States

www.cdc.gov/travel/




Zoster



Zoster


- Risk factors

Aging
Cellular immunosuppression
Intrauterine exposure to VZV
Varicella at <18 month of age




Zoster: Complications

- Post-herpetic neuralgia
- Pain that lasts after rash clears, sometime up to a year
- Occurs in 20 percent of shingles cases




Zoster Vaccine

- Zostavax by Merck
- Licensed May 2006
- Live attenuated vaccine
- Indicated for prevention of zoster



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



Zoster Vaccine

- Contraindications
- Severe allergic reaction to vaccine component or following a prior dose
- Immunosuppression
- Pregnancy
- Active, untreated tuberculosis


- Precautions
- Moderate or severe acute illness



Combination Vaccines

- DTaP, DT
- MMR
- MMRV
- Tdap, Td


- DTaP/Hep B/IPV (Pediarix®)
- Hep B/Hib (Comvax®)
- DTaP/Hib (TriHIBit®)
- Hep A/Hep B (Twinrix®)
- DTaP/IPV/Hib (Pentacel®)
- DTaP/IPV (Kinrix™)



General Guidelines


“Licensed combination vaccines may be used whenever any components of the combination are indicated and other components are not contraindicated and if approved by the Food and Drug Administration for that dose of the series.”

Spacing and timing rules same as for individual antigens




General Guidelines

- Use of licensed combination vaccines is preferred to separate injection of their equivalent component vaccines to reduce the number of injections and missed opportunities to protect through vaccination
- Exception: no preference between MMR and MMRV



Use of Combination Vaccines

Pros	Cons
↓ number of injections	Higher costs
↑ timely coverage	Unnecessary doses
↓ costs of stocking & administering separate vaccines	
↓ costs of extra healthcare visits	
Facilitate introduction of new vaccines & recommendations	



Combination Vaccines

- Immunogenicity and safety studies performed alongside separate components given simultaneously
- Considered to effective when immunogenicity found to be “non-inferior” to separate components
- Similar comparison for safety



Pentacel®

- ActHib reconstituted with DTaP/IPV
- May be used for first four doses of DTaP and Hib
- Can count as four doses of IPV if given at approved ages
- Additional dose of IPV (NOT Pentacel®) may be required for school at 4-6 years of age




Pentacel®

- Fourth dose of Pentacel® licensed for 15 – 18 months old
- A dose does NOT need to be repeated if fourth dose given as young as 12 months of age, as long as the appropriate minimum interval maintained from previous dose




Kinrix™

- Combination DTaP/IPV
- Recommended for the fifth dose of DTaP, and the fourth dose of IPV
- Recommended age: 4-6 years



Kinrix™

- If fourth dose of IPV given at a four week minimum interval from dose three, and with a minimum age of 18 weeks, it does not have to be repeated
- WARNING: DTaP MAY need to be repeated – minimum age for fourth dose 12 months
- DO NOT use Kinrix™ in infancy



Kinrix™


- Kinrix™ is for

KINDERGARTEN!!




Strategies for Increasing Immunization Levels

- Vaccines for Children – Assessment, Feedback, Incentives, eXchange (VFC-AFIX) visits
- Accurate Record Keeping
- Physician recommendation
- Provider/patient reminder/recall
- Avoid missed opportunities
- Reduce barriers to immunization



VFC - AFIX


- Task Force on Community Preventive Services – Strong Recommendation to link services with education
 - 14 studies, showed coverage levels rise 16% (median)
- Can be combined with educational activities
 - 17 studies showed a rise of 16% (median)



Accurate Record Keeping


A component of provider/client reminder/recall

National Vaccine Advisory Committee recommended - Proper documentation a Standard for Child and Adolescent Immunization Practices




Physician Recommendation

- Resources
 - Child and Adolescent Immunization Schedule
 - Child and Adolescent Catch Up Schedule
 - Adult Schedule
 - General Recommendations on Immunization
 - Table 1




Provider/patient reminder/recall

- Immunization grid in patient's chart
- Patient vaccination record
- Post-card mailout
- Strongly Recommended by Task Force on Community Preventive Services
 - Patients: 42 studies showed a rise of 8% (median)
 - Providers: 29 studies showed a rise of 17% (median)




Avoid Missed Opportunities to Vaccinate

- False contraindications and/or precautions
- Fear of multiple injections
- Fear of multiple doses
- Misperceptions about repeat doses



False Contraindications/Precautions


- Pregnancy (inactivated vaccines)
- Autoimmune disease
- Pregnancy in household contact
- Immunodeficient household contact
- Contact allergies
- Upper Respiratory Infections



True Contraindications and Precautions


Condition	Live	Inactivated
Allergy to Component	C	C
Encephalopathy	---	C
Pregnancy	C	V
Immunosuppression	C	V
Severe illness	P	P
Recent blood product	P	V

C=contraindication P=precaution V=vaccinate if indicated




Reduce Barriers to Immunization

- Reduce costs of vaccination – recommended by the Task Force on Community Preventive Services
- Expanding Access in Medical or Clinical Settings



Different Strain Composition

- Bivalent HPV
- Group B Meningococcal Vaccine
- 11-valent Pneumococcal Vaccine



New Microbes

- *Borrelia burgdorferii* (Lyme Disease)
- *Coccidioides Immitis*
- *Herpes simplex types I and II*
- *Leishmania major*
- *Mycobacterium leprae* – (Leprosy)
- *Vibrio cholerae*



Other Future Vaccines

- HIV/AIDS
- Hepatitis C
- Malaria
- *Mycobacterium tuberculosis*
- SARS
- West Nile Virus

