

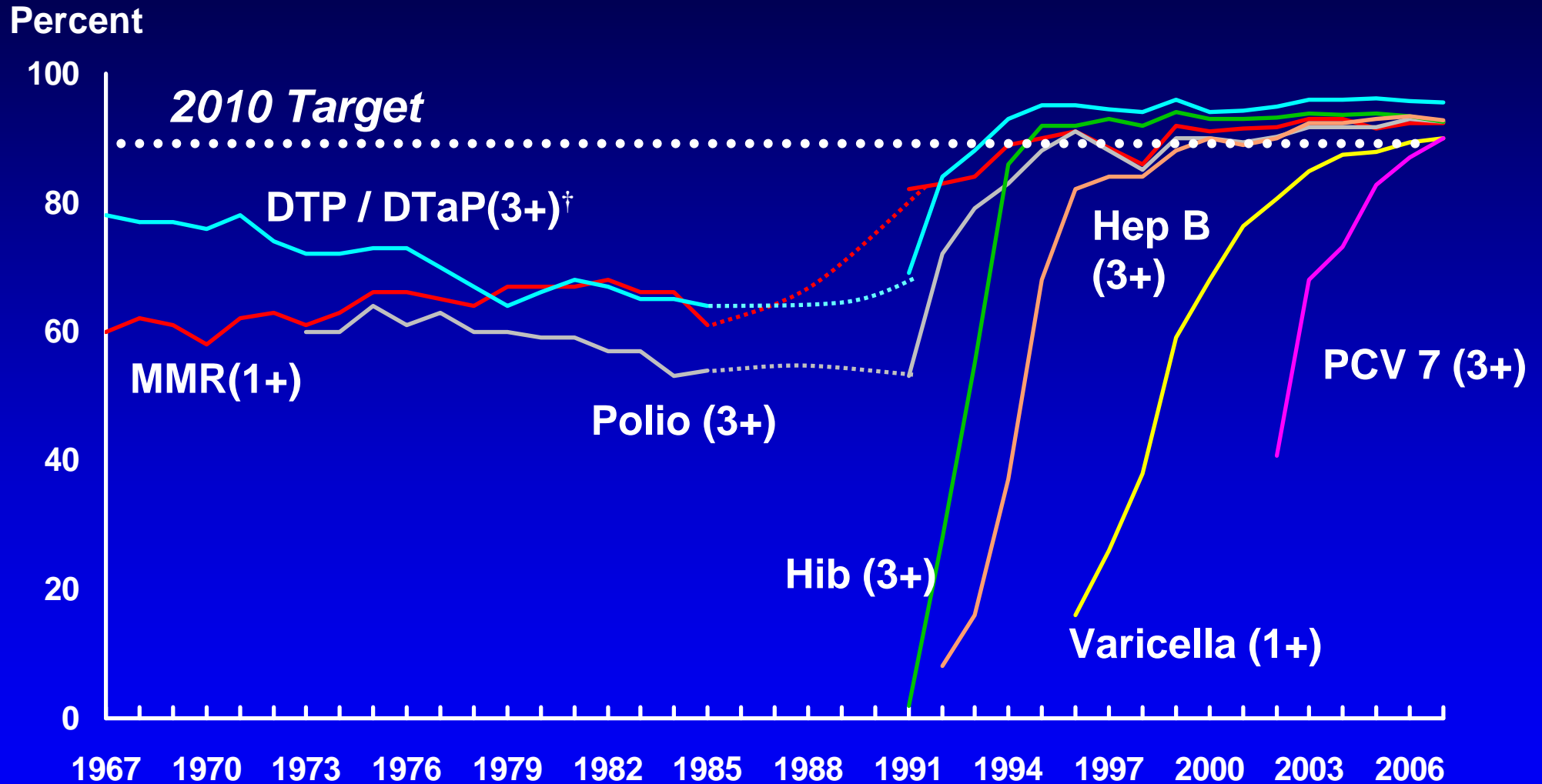
# **Immunization Update**

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Centers for Disease Control and Prevention**

**Alaska Statewide Maternal Child Health and  
Immunization Conference  
September 22, 2008**



# Vaccine-Specific Coverage Rates among Preschool-Aged Children, United States

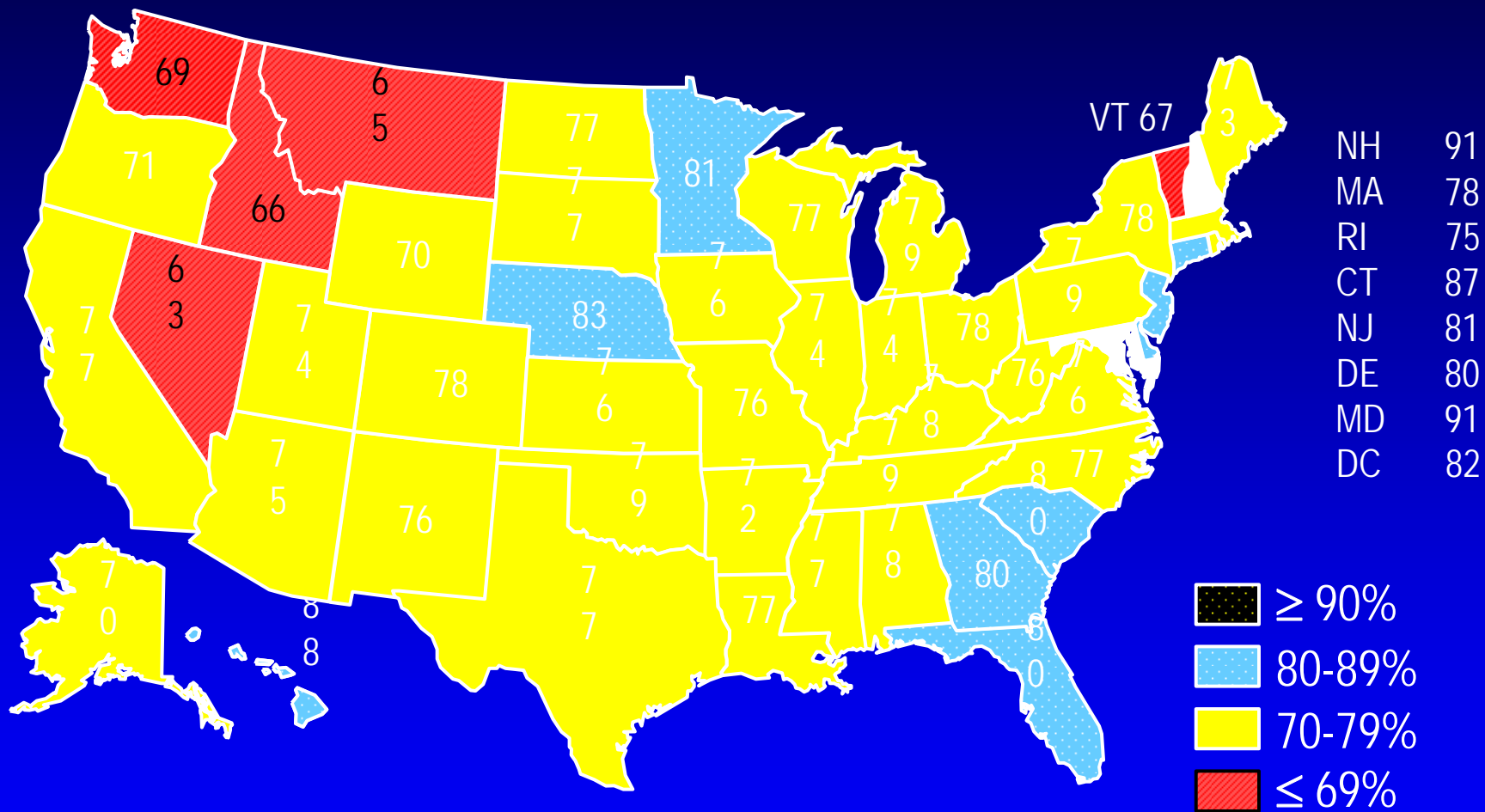


<sup>†</sup> DTP(3+) is not a Healthy People 2010 objective. DTaP(4) is used to assess Healthy People 2010 objectives.

Note: Children in the USIS and NHIS were 24-35 months of age. Children in the NIS were 19-35 months of age.

Source: USIS (1967-1985), NHIS (1991-1993) CDC, NCHS, and NIS (1994-2006), CDC, NIP and NCHS; No data from 1986-1990 due to cancellation of USIS because of budget reductions.

# Estimated Vaccination Coverage with the 4:3:1:3:3:1\* Series, by Coverage Level and State 2007 National Coverage = 77%



\*4+DTaP, 3+Polio, 1+MMR, 3+Hib, 3+HepB, 1+Varicella

Source: CDC. National, state, and local area vaccination coverage among children aged 19-35 months---United States, 2007.

# **PedvaxHib<sup>®</sup> Shortage**

- **Merck is experiencing a production problem with their Hib vaccine**
- **PedvaxHib is currently not available**
- **Improvement in the supply is not expected until late 2008**
- **Children who began the Hib schedule with PedvaxHib will need to complete the schedule with ActHIB**

# Hib Vaccination Recommendations During the Current Shortage

- The **booster dose** of Hib vaccine usually administered at 12-15 months of age should be deferred except for children at increased risk of Hib disease
  - asplenia
  - sickle cell disease
  - immunodeficiency (including HIV infection and cancer)
  - American Indian children
  - Alaska Native children

# MMRV (ProQuad®)

- **Combination measles, mumps, rubella and varicella vaccine**
- **Contains 7-8 times as much varicella vaccine virus as does monovalent varicella vaccine**
- **Approved ONLY for children 12 months through 12 years of age (up to age 13 years)**
- **May be used for either or both doses of varicella vaccine for children younger than 13 years of age**

# **Adverse Reactions Following MMRV and MMR+V**

- **During the 7-10 days after vaccination about one additional febrile seizure would be expected to occur for every 2,000 children who receive MMRV vaccine rather than separate MMR and varicella vaccines**

# ACIP Vote on MMRV February 27, 2008

- “Combination MMRV vaccine is approved for use among healthy children aged 12 months–12 years. MMRV vaccine is indicated for simultaneous vaccination against measles, mumps, rubella, and varicella. ACIP **does not express a preference** for use of MMRV vaccine over separate injections of equivalent component vaccines (i.e., MMR vaccine and varicella vaccine).”



# **Rotarix<sup>®</sup> Rotavirus Vaccine**

- **Approved by FDA in April 2008**
- **Contains one strain of live attenuated human rotavirus (G1P[8])**
- **Two oral doses at 2 and 4 months of age (minimum interval 4 weeks)**
- **Minimum age 6 weeks**
- **Maximum age 24 weeks**

# Provisional Rotavirus Vaccine Recommendations

- **For BOTH vaccines**
  - **Maximum age for first dose is 14 weeks\***
  - **Minimum interval between doses is 4 weeks**
  - **Maximum age for ANY dose is 8 calendar months\***
- **If any dose in the series was RV5 (RotaTeq) or the product is unknown for any dose in the series, a total of three doses of rotavirus vaccine should be given**

\*off-label. See [www.cdc.gov/vaccines/recs/provisional/](http://www.cdc.gov/vaccines/recs/provisional/)

# **KINRIX™ Vaccine**

- **Approved by FDA in June 2008**
- **Contains DTaP (Infanrix) and IPV**
- **Approved ONLY for the 5<sup>th</sup> dose of DTaP and 4<sup>th</sup> dose of IPV in children 4 through 6 years of age\***
- **Do NOT use for earlier doses in the DTaP or IPV series**
- **Single dose syringe contains latex**

**\*whose previous doses have been with Infanrix and/or Pediarix for the first 3 doses and Infanrix for the 4<sup>th</sup> dose**

# **KINRIX™ Vaccine**

- **Use of KINRIX for any dose other than DTaP5 and IPV4 is off-label, and should be considered a medication error**
- **Medication errors should be reported to the Institute for Safe Medical Practices**
  - **[www.ismp.org](http://www.ismp.org)**

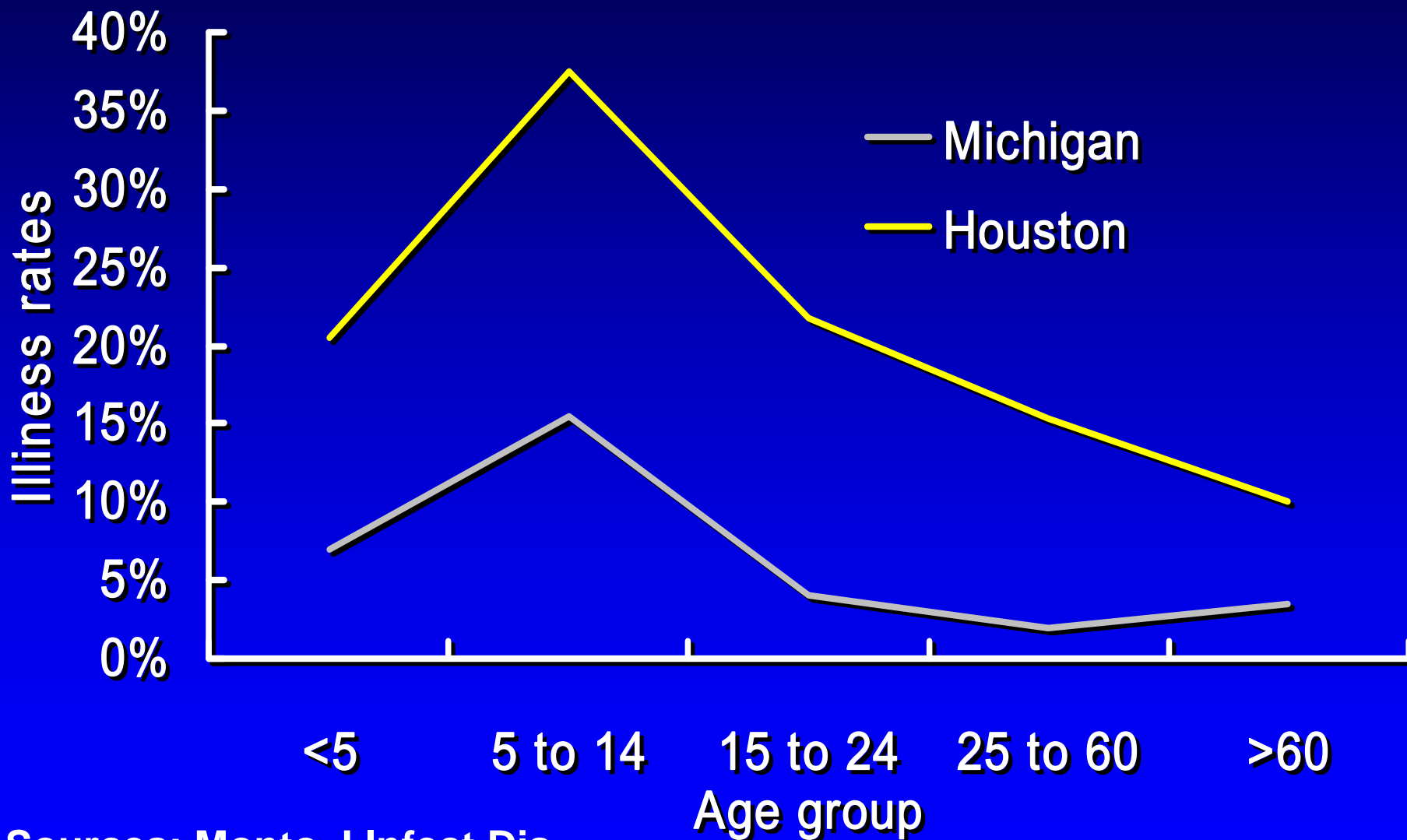
# **Pentacel<sup>®</sup> Vaccine**

- **Approved by FDA in June 2008**
- **Contains DTaP, Hib, and IPV**
- **Approved for doses 1 through 4 among children 6 weeks through 4 years of age**
- **Do not use for in children 5 years or older**
- **Package contains lyophilized Hib (ActHib) that is reconstituted with a liquid DTaP (Daptacel)/IPV solution**

# **The Evolution of Influenza Vaccination Recommendations**

- **Children 24-59 months were included for routine vaccination in 2007-2008**
- **Healthy school-aged children are included for routine vaccination in 2008-2009**
- **In 3-5 years annual influenza vaccination will be recommended for the entire U.S. population**

# Average Influenza-Associated Illness Rates by Age Group\*



Sources: Monto J Infect Dis  
Glezen N Engl J Med

# Burden of Influenza Among School-Aged Children

- **Few deaths and hospitalizations compared to younger children, elderly, or chronically ill**
- **5-7 outpatient visits per 100 children annually, frequently receive antibiotics**
- **10-30 illnesses per 100 children – frequently associated with school absenteeism**



# **Pediatric Influenza Deaths– 2007-2008**

- **85 influenza-related deaths among children 0-17 years of age**
  - **Median age 6.4 years**
  - **23 (27%) younger than 24 months**
  - **44 (52%) 5 through 17 years of age**
- **Only 5 known to have been vaccinated according to 2007-2008 recommendations**

*MMWR* 2008;57(No. 25):692-7 and CDC unpublished data

# **ACIP Recommendations for Influenza Vaccine, 2008**

- **All children aged 6 months through 18 years should receive annual influenza vaccination, beginning in 2008 if feasible, and beginning no later than during the 2009-2010 influenza season**

# 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	No
	Multidose vial	0.5 mL	≥18 yrs	Yes

\*inactivated vaccines approved for children younger than 4 years

# Trivalent Inactivated Influenza Vaccine (TIV) Schedule

Age Group	Dose	# Doses
6-35 mos	0.25 mL	1 or 2*
3-8 yrs	0.50 mL	1 or 2*
9 years or older	0.50 mL	1

TIV should only be administered by the intramuscular route.

\*Doses should be separated by at least 4 weeks.

*MMWR* 2008;57 (RR-7)

# Influenza Vaccination of Children

- Children 6 months through 8 years of age who did not receive the recommended second dose of influenza vaccine in the initial year that they received influenza vaccine should receive 2 doses during the next influenza season
- Children 6 months through 8 years of age who are being vaccinated two or more seasons after receiving an influenza vaccine for the first time should receive a single annual dose, regardless of the number of doses administered previously

# Live Attenuated Influenza Vaccine

- **Approved for healthy persons 2 years through 49 years of age who are not pregnant, such as**
  - **healthcare personnel**
  - **persons in close contact with high-risk groups**
  - **Healthy children**
  - **persons who want to reduce their risk of influenza**

# LAIV Schedule

<u>Age Group</u>	<u>Number of Doses</u>
2 through 8 years -no previous influenza vaccine	2 (separated by 4 weeks)
-previous influenza vaccine	1 or 2
9 through 49 years	1

# **Human Papillomavirus (HPV) Vaccines**

- **HPV causes cervical cancer**
  - **Types 16 and 18 account for ~70% of cervical cancer**
- **One vaccine licensed in the U.S., another under development**
- **HPV vaccines are highly effective against precancerous lesions**
- **HPV vaccine only effective if given prior to infection**
- **Recommended for routine use in girls at 11-12 years of age**



# **HPV Vaccine**

## **Duration of Immunity**

- **The duration of immunity after a complete 3-dose schedule is not known**
  - **Available evidence indicates protection for at least 5 years**
  - **Multiple cohort studies are in progress to monitor the duration of immunity**

# Human Papillomavirus Vaccine

- HPV vaccine is not currently approved for males and women older than 26 years
  - Limited safety and immunogenicity data available for males
  - Off-label use not recommended
- Studies of clinical efficacy in progress now
- Merck has applied to FDA for extension of age through 45 years (females only)

# HPV Vaccination Schedule

- Routine schedule is 0, 2, 6 months
- Intramuscular injection in the deltoid
- Minimum intervals
  - 4 weeks between doses 1 and 2
  - 12 weeks between doses 2 and 3
  - 24 weeks between doses 1 and 3
- Minimum age is 9 years
- Maximum age is 26 years

# HPV Vaccine and Syncope

- Reports of syncope received by the VAERS has been detected
- Most reported are from adolescent females, many of which received HPV vaccine
- Clinicians who vaccinate adolescents are advised to have patient seated, and consider a 15-20 minute observation period after vaccination

# HPV Vaccine Adverse Reactions: Clinical Trials

- **Mild local reaction most common** **84%**
  - Redness, soreness, itching at site
- **Fever** **10%\***
- **No serious adverse reactions reported**

**\*similar to reports in placebo recipients (9%)**

# HPV Vaccine VAERS Reports\*

- **9,749 reports**
  - **94% classified as non-serious (local reactions, syncope, fatigue, etc)**
  - **6% classified as serious**
- **20 deaths reported**
  - **no common pattern to the deaths**
  - **the cause of death was explained by factors other than the vaccine**

\*As of June 30, 2008

[www.cdc.gov/vaccinesafety/vaers/gardasil.htm](http://www.cdc.gov/vaccinesafety/vaers/gardasil.htm)

# HPV Vaccine VAERS Reports

- **Guillain-Barré Syndrome (GBS)**
  - no evidence that HPV vaccine has increased the rate above that expected in the population
- **Thromboembolic disorders (blood clots)**
  - Most had known risk factors (e.g., oral contraceptive use)
  - Additional studies are being conducted

\*As of June 30, 2008

[www.cdc.gov/vaccinesafety/vaers/gardasil.htm](http://www.cdc.gov/vaccinesafety/vaers/gardasil.htm)

# **Herpes Zoster Vaccine (Zostavax<sup>®</sup>)**

- **Administered to persons who had chickenpox to reduce the risk of subsequent development of zoster and postherpetic neuralgia**
- **Contains live varicella vaccine virus in much larger amount (14x) than standard varicella vaccine (Varivax<sup>®</sup>)**
- **Requires freezer storage AT ALL TIMES**



# Herpes Zoster Vaccine Trial

- 36,716 persons 60-80+ years of age followed for average of 3.12 years after vaccination
- Compared to the placebo group the vaccinated group had
  - 51.3% fewer episodes of HZ
  - Less severe illnesses
  - 66.5% less postherpetic neuralgia
- No significant safety issues identified

*NEJM* 2005;352(22):2271-84.

# **ACIP Recommendations for Zoster Vaccine**

- **Adults 60 years and older should receive a single dose of zoster vaccine**
- **Routine vaccination of persons younger than 60 years is NOT recommended**
- **Need for booster dose or doses not known at this time**
- **A history of herpes zoster should not influence the decision to vaccinate**

*MMWR* 2008;57(RR-5)

# Zoster Vaccine

- **It is not necessary to inquire about chickenpox or test for varicella immunity before administering zoster vaccine**
- **Persons 60 years of age and older can be assumed to be immune regardless of their recollection of chickenpox**

# **Zoster Vaccine**

## **Contraindications and Precautions**

- **Severe allergic reaction to a vaccine component or following a prior dose**
- **Immunosuppression from any cause**
- **Pregnancy or planned pregnancy within 4 weeks**
- **Moderate or severe acute illness**
- **Recent blood product is NOT a precaution**

# **CDC Vaccines and Immunization Contact Information**

- **Telephone**            **800.CDC.INFO**
- **Email**                **nipinfo@cdc.gov**
- **Website**  
                         **[www.cdc.gov/vaccines](http://www.cdc.gov/vaccines)**
- **Vaccine Safety**  
                         **[www.cdc.gov/vaccinesafety](http://www.cdc.gov/vaccinesafety)**