


## Adolescent Immunization Update

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## Adolescent Immunizations

1. Review adolescent vaccine recommendations
2. Vaccine Safety/Errors
3. Communicating with parents about adolescent vaccines



## Adolescence

- Transitional phase of mental and physical development between childhood and adulthood
- Variety of definitions used
  - CDC: 10-24 years
  - Department of Health and Human Services: 11-21 years
  - Society for Adolescent Medicine: 10-19 years

## Use CDC Immunization Schedules

Recommended Immunization Schedule for Persons Aged 7 Through 18 Years—United States • 2009  
*For those who fall behind or start late, see the schedule below and the catch-up schedule*

Vaccine ▼	Age ▶	7–10 years	11–12 years	13–18 years
Tetanus, Diphtheria, Pertussis <sup>1</sup>	<i>see footnote 1</i>		<b>Tdap</b>	<b>Tdap</b>
Human Papillomavirus <sup>2</sup>	<i>see footnote 2</i>		<b>HPV (3 doses)</b>	<b>HPV Series</b>
Meningococcal <sup>3</sup>		<b>MCV</b>	<b>MCV</b>	<b>MCV</b>
Influenza <sup>4</sup>			<b>Influenza (Yearly)</b>	
Pneumococcal <sup>5</sup>			<b>PPSV</b>	
Hepatitis A <sup>6</sup>			<b>HepA Series</b>	
Hepatitis B <sup>7</sup>			<b>HepB Series</b>	
Inactivated Poliovirus <sup>8</sup>			<b>IPV Series</b>	
Measles, Mumps, Rubella <sup>9</sup>			<b>MMR Series</b>	
Varicella <sup>10</sup>			<b>Varicella Series</b>	

Range of recommended ages  
 Catch-up immunization  
 Certain high-risk groups

## Use CDC Immunization Schedules

CATCH-UP SCHEDULE FOR PERSONS AGED 7 THROUGH 18 YEARS					
Vaccine	Age	7–10 years	11–12 years	13–18 years	
Tetanus, Diphtheria, Pertussis <sup>1</sup>	7 yrs <sup>10</sup>	4 weeks	4 weeks if first dose administered at younger than 12 months of age; 6 months if first dose administered at younger than 12 months of age	6 months if first dose administered at younger than 12 months of age	
Human Papillomavirus <sup>11</sup>	9 yrs	Routine dosing intervals are recommended <sup>11</sup>			
Hepatitis A <sup>6</sup>	12 mos	6 months			
Hepatitis B <sup>7</sup>	Birth	4 weeks	8 weeks (and at least 19 weeks after first dose)		
Inactivated Poliovirus <sup>8</sup>	6 wks	4 weeks	4 weeks	4 weeks <sup>8</sup>	
Measles, Mumps, Rubella <sup>9</sup>	12 mos	4 weeks			
Varicella <sup>10</sup>	12 mos	3 months if the person is younger than 13 years of age; 4 weeks if the person is aged 13 years or older			

## Use CDC Immunization Schedules

FIGURE 1. Recommended adult immunization schedule by vaccine and age group — United States, 2009

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

\* Covered by the vaccine injury compensation program. <sup>1</sup> For all persons in this category who meet the age and vaccination criteria and who have evidence of immunity (or lack documentation of vaccination or have evidence of prior infection). <sup>2</sup> Recommended if person after risk factor is present (e.g., on the basis of medical, occupational, household, or other indications). <sup>3</sup> No recommendation.

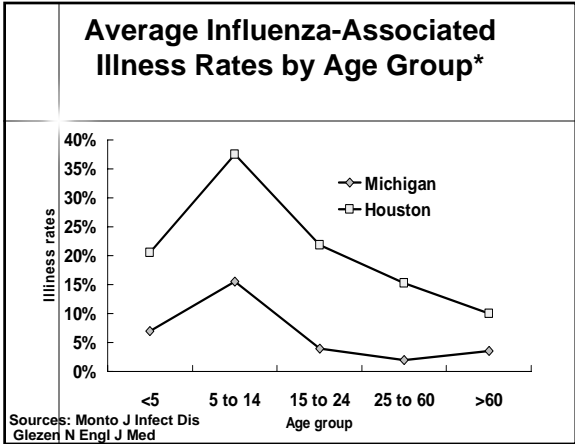
(The presentation may not include all slides listed and the order may be changed.)

Adolescents Need a Variety of Vaccines	
Routine Use	Catch Up if Not Previously Given
<ul style="list-style-type: none"> <li>• Pertussis (Tdap)</li> <li>• Human Papillomavirus (HPV4; females only)</li> <li>• Meningococcal (MCV4)</li> <li>• Influenza</li> </ul>	<ul style="list-style-type: none"> <li>• Hepatitis B</li> <li>• Polio (IPV)</li> <li>• Measles-mumps-rubella (MMR)</li> <li>• Varicella</li> <li>• Hepatitis A</li> </ul>

Special Circumstances
<ul style="list-style-type: none"> <li>• <b>Pneumococcal</b> <ul style="list-style-type: none"> <li>– Functional asplenia</li> <li>– Immunosuppression</li> <li>– Cochlear implant</li> </ul> </li> <li>• <b>Hib</b> <ul style="list-style-type: none"> <li>– Immunosuppression/asplenia</li> </ul> </li> </ul>

What's New for 2009?
<ul style="list-style-type: none"> <li>★ Influenza vaccine <ul style="list-style-type: none"> <li>– now recommended routinely for all adolescents through 18 years</li> </ul> </li> <li>★ Clarification of HPV4 catch up schedule</li> <li>★ Discussion of minimum interval between Td and Tdap</li> <li>★ Discussion of Hib vaccination for children 5 years of age and older</li> </ul>

Influenza



Summary of Influenza Burden in School Aged Children
<ul style="list-style-type: none"> <li>• Few deaths and hospitalizations compared to younger children, elderly, or chronically ill</li> <li>• 5-7 outpatient visits per 100 children annually, frequently receive antibiotics</li> <li>• 10-30 illnesses per 100 children – frequently associated with school absenteeism</li> </ul> <p>Source: B. Atkinson, Immunization Update MDCH, 2008</p>

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## Influenza Vaccine – Evolution of Recommendations

- 2007-2008: Children 24-59 months included for routine vaccination
- ★ 2008-2009: Routine vaccination expanded to include all children age 6 mo - 18 years
- In 2-4 years annual influenza vaccination will be recommended for the entire U.S. population

## Two Influenza Vaccine Products Available

- Inactivated vaccine (TIV)
  - Injectable vaccine
  - Available for those 6 months of age and older, even those with high risk condition
- Live attenuated vaccine (LAIV)
  - Approved for non-pregnant, healthy persons 2 through 49 years of age
  - Persons in close contact with high-risk groups
  - Healthcare personnel

MMWR 2007.56 (RR-6)

## LAIV Contraindications

- Pregnancy (breastfeeding allowed)
- Contacts of those with severe immunosuppression (i.e. HSCT)
  - does not include contacts of individuals with HIV, DM, asthma taking steroids
- Those with medical conditions placing them at high risk of flu complications (chronic heart/lung dz, asthma, DM, kidney failure, immunosuppression)
- Adolescents on aspirin therapy

## Human papillomavirus (HPV4)

## Human Papillomavirus (HPV)

- Genital HPV is the most prevalent sexually transmitted infection in the US
  - ~20 million currently infected
  - 6 million new infections/year
  - Estimated 80% of sexually active persons will have been infected by age 50

Cates, STD 26:Supp 1-7 (1999); Meyers et al. Am J Epidemiol 151: 1158-1171 (2000)

## HPV-Associated Disease

- Most infections asymptomatic and resolve.
- However, persistent HPV infection can lead to a variety of anogenital cancers
  - Virtually all cervical cancers
  - Substantial proportion of vaginal, penile and anal cancers
  - Some head a neck cancers
- Non-cancerous HPV-related conditions
  - Almost all genital warts
  - Almost all respiratory papillomatosis

<b>Quadrivalent HPV Vaccine</b>	
	<ul style="list-style-type: none"> <li>• Among uninfected females, nearly 100% effective in preventing infection and genital lesions from HPV types 6/11/16/18</li> <li>• No evidence of efficacy against existing disease or infection (i.e., the vaccine is not therapeutic)</li> <li>• Prior infection with one HPV type did not diminish efficacy of the vaccine against other HPV vaccine types</li> </ul>

<b>HPV4 Vaccine Recommendations</b>	
	<ul style="list-style-type: none"> <li>• Routine vaccination of females 11-12 years of age with “catch-up” vaccination through age 26 years <ul style="list-style-type: none"> <li>– May complete series at age 27 if began before 26 years of age</li> </ul> </li> <li>• Series initiation as young as 9 years of age at the clinician’s discretion</li> <li>• Prior abnormal Pap smear, genital warts, or HPV infection is NOT a contraindication to vaccination <small>MMWR 2007;56(No. RR-2)</small></li> </ul>

<b>Recommended HPV4 Vaccination Schedule</b>	
	<ul style="list-style-type: none"> <li>★ Use the same schedule for “routine” and “catch up” vaccination <ul style="list-style-type: none"> <li>– 0, 2, 6 months</li> <li>– 3rd dose at least 24 weeks after first dose</li> </ul> </li> <li>• Intramuscular injection in the deltoid</li> </ul> <p><small>MMWR 2006;56(No. RR-2):1-23</small></p>

<b>HPV4 Minimum Intervals</b>	
	<ul style="list-style-type: none"> <li>• Minimum intervals between doses should not be used for routine vaccination <ul style="list-style-type: none"> <li>– 1st - 2nd dose: 4 weeks</li> <li>– 2nd - 3rd dose: 12 weeks</li> <li>– 1st - 3rd dose: 24 weeks</li> </ul> </li> <li>• There are few data on efficacy of alternative HPV4 vaccination schedules</li> </ul>

<b>HPV4 Vaccine Contraindications</b>	
	<ul style="list-style-type: none"> <li>• Males</li> <li>• Women older than 26 years <ul style="list-style-type: none"> <li>– Studies of clinical efficacy in progress now</li> <li>– The manufacturer has applied to FDA for extension of age through 45 years (females only)</li> </ul> </li> </ul>

<b>HPV4 Vaccination During Pregnancy</b>	
	<ul style="list-style-type: none"> <li>• Series initiation should be delayed until after completion of pregnancy</li> <li>• If a woman is found to be pregnant after initiating the vaccination series, remaining doses should be delayed until after the pregnancy</li> <li>• If a vaccine dose has been administered during pregnancy, there is no indication for intervention</li> <li>• Women vaccinated during pregnancy should be reported to manufacturer’s registry at 800.986.8999 <small>MMWR 2006;56(No. RR-2):1-23, March 23, 2007</small></li> </ul>

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