Vaccine update & Implementation

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From Charles Darwin:

“It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change.”
Disclosures

• Grant/Research Funding for clinical trials
  – GSK, Merck, Novartis, Sanofi-Pasteur, Pfizer
Objective

• Epidemiology/Vaccine information
• Vaccine updates
  – kids
  – Teens
  – Pregnancy
  – Adults
• Implementation strategy
VACCINES WORK

These bubbles are sized according to the annual number of disease cases in the US during the 1900s versus 2010. We’ve come so far. It’s a reminder that while disease rates are low, most diseases haven’t disappeared. This is why we continue to vaccinate.

<table>
<thead>
<tr>
<th>Disease</th>
<th>THEN</th>
<th>NOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smallpox</td>
<td>29,005</td>
<td>0</td>
</tr>
<tr>
<td>Measles</td>
<td>530,217</td>
<td>61</td>
</tr>
<tr>
<td>Diphtheria</td>
<td>21,053</td>
<td>0</td>
</tr>
<tr>
<td>Pertussis</td>
<td>200,752</td>
<td>21,291</td>
</tr>
<tr>
<td>Tetanus</td>
<td>580</td>
<td>8</td>
</tr>
<tr>
<td>Polio</td>
<td>16,316</td>
<td>0</td>
</tr>
<tr>
<td>Mumps</td>
<td>162,344</td>
<td>2,528</td>
</tr>
<tr>
<td>Rubella</td>
<td>47,745</td>
<td>6</td>
</tr>
<tr>
<td>Haemophilus Influenza</td>
<td>20,000</td>
<td>270</td>
</tr>
</tbody>
</table>


Immunization Resource
Immunization Schedules

For Health Care Professionals

NEW 2014 SCHEDULES

Schedules and Tools
Schedules to order or print, recommendations to consult, and tools to download.

* Birth-18 Years and Catch-up Versions
  Find printable versions in various formats: regular paper, pocket size, MMWR, and laminated; load on your smartphone; check the binational resource...

* Adult Version
  Find printable formats in various sizes, download the interactive tool, or load the schedule on your smartphone...

For Everyone

Easy-to-read Schedules for All Ages
Easy-to-read formats to print, tools to download, and ways to prepare for your office visit.

* Infants and Children (birth through 6 years old)
  Find easy-to-read formats to print, create an instant schedule for your child, determine missed or skipped vaccines, and prepare for your office visit...

* Preteens & Teens (7 through 18 years old)
  Print this friendly schedule, take a quick quiz, fill out the screening form before your child’s doctor visit, or download a tool to determine vaccines needed...
# 2014 Recommended Immunizations for Children from Birth Through 6 Years Old

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Birth</th>
<th>1 month</th>
<th>2 months</th>
<th>4 months</th>
<th>6 months</th>
<th>12 months</th>
<th>15 months</th>
<th>18 months</th>
<th>19-23 months</th>
<th>2-3 years</th>
<th>4-6 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HepB</td>
<td>HepB</td>
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<td>HepB</td>
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<tr>
<td></td>
<td>RV</td>
<td>RV</td>
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<td>DTaP</td>
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<tr>
<td></td>
<td>Hib</td>
<td>Hib</td>
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<td>Hib</td>
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<tr>
<td></td>
<td>PCV</td>
<td>PCV</td>
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<td>PCV</td>
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<tr>
<td></td>
<td>IPV</td>
<td>IPV</td>
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<td>IPV</td>
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<td></td>
<td></td>
<td></td>
<td>Influenza (Yearly)*</td>
<td>MMR</td>
<td>Varicella</td>
</tr>
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</tbody>
</table>

### Shaded boxes indicate the vaccine can be given during the shown age range.

### Is your family growing? To protect your new baby and yourself against whooping cough, get a diph vaccine in the third trimester of each pregnancy. Talk to your doctor for more details.

### NOTE: If your child misses a shot, you don’t need to start over. Just go back to your child’s doctor for the next shot. Talk with your child’s doctor if you have questions about vaccines.

### FOOTNOTES:
- Two doses given at least four weeks apart are recommended for children aged 8 months through 8 years of age who are getting a flu vaccine for the first time and for some other children in this age group.
- Two doses of HepA vaccine are needed for lasting protection. The first dose of HepA vaccine should be given between 12 months and 23 months of age. The second dose should be given 6 to 18 months later. HepA vaccination may be given to any child 12 months and older to protect against HepA. Children and adolescents who did not receive the HepA vaccine and are at high-risk should be vaccinated against HepA.

If your child has any medical conditions that put him at risk for infection or is traveling outside the United States, talk to your child’s doctor about additional vaccines that he may need.

For more information, call toll free 1-800-CDC-INFO (1-800-232-4636) or visit [http://www.cdc.gov/vaccines](http://www.cdc.gov/vaccines)
2014 Recommended Immunizations for Children from 7 Through 18 Years Old

7-10 YEARS
- Tetanus, Diphtheria, Pertussis (Tdap) Vaccine
- Meningococcal Conjugate Vaccine (PCV13) Dose
- Measles, Mumps, Rubella (MMR) Vaccine Series
- Varicella Vaccine Series
- MCV4
- Influenza (Yearly)*
- Pneumococcal Vaccine
- Hepatitis A (HepA) Vaccine Series
- Hepatitis B (HepB) Vaccine Series
- Inactivated Polio Vaccine (IPV) Series

8-12 YEARS
- Tetanus, Diphtheria, Pertussis (Tdap) Vaccine
- Human Papillomavirus (HPV) Vaccine (3 Doses)*
- MCV4 Dose 1
- Influenza (Yearly)*
- Pneumococcal Vaccine
- Hepatitis A (HepA) Vaccine Series
- Hepatitis B (HepB) Vaccine Series
- Inactivated Polio Vaccine (IPV) Series
- Measles, Mumps, Rubella (MMR) Vaccine Series
- Varicella Vaccine Series
- Influenza (Yearly)*
- Pneumococcal Vaccine
- Hepatitis A (HepA) Vaccine Series
- Hepatitis B (HepB) Vaccine Series
- Inactivated Polio Vaccine (IPV) Series
- Measles, Mumps, Rubella (MMR) Vaccine Series
- Varicella Vaccine Series

13-18 YEARS
- Tetanus, Diphtheria, Pertussis (Tdap) Vaccine
- Human Papillomavirus (HPV) Vaccine (3 Doses)*
- MCV4 Dose 1
- Influenza (Yearly)*
- Pneumococcal Vaccine
- Hepatitis A (HepA) Vaccine Series
- Hepatitis B (HepB) Vaccine Series
- Inactivated Polio Vaccine (IPV) Series
- Measles, Mumps, Rubella (MMR) Vaccine Series
- Varicella Vaccine Series
- Influenza (Yearly)*
- Pneumococcal Vaccine
- Hepatitis A (HepA) Vaccine Series
- Hepatitis B (HepB) Vaccine Series
- Inactivated Polio Vaccine (IPV) Series
- Measles, Mumps, Rubella (MMR) Vaccine Series
- Varicella Vaccine Series
- Influenza (Yearly)*
- Pneumococcal Vaccine
- Hepatitis A (HepA) Vaccine Series
- Hepatitis B (HepB) Vaccine Series
- Inactivated Polio Vaccine (IPV) Series
- Measles, Mumps, Rubella (MMR) Vaccine Series
- Varicella Vaccine Series

FOOTNOTES
1 Tdap vaccine is a combination vaccine that is recommended at age 11 or 12 to protect against tetanus, diphtheria, and pertussis. If your child has not received any or all of the DTaP vaccine series, or if you don't know if your child received these shots, your child needs a single dose of Tdap when they are 7-10 years old. Talk to your child's health care provider to find out if they need additional catch-up vaccines.
2 All 11 or 12 year olds—both girls and boys—should receive 3 doses of HPV vaccine to protect against HPV-related disease. Either HPV vaccine (Cervarix® or Gardasil®) can be given to girls and young women; only one HPV vaccine (Gardasil®) can be given to boys and young men.
3 Meningococcal conjugate vaccine (MCV) is recommended at age 11 or 12. A booster shot is recommended by age 16. Teens who received MCV for the first time at age 13 through 15 years will need a one-time booster dose between the ages of 16 and 18 years. If your teenager missed getting the vaccine earlier, talk to their health care provider about getting it now, especially if your teenager is about to move into a college dorm or military barracks.
4 Everyone 6 months of age and older—including pregnant women—who should get a flu vaccine every year. Children under the age of 9 years may require more than one dose. Talk to your child's health care provider to find out if they need more than one dose.
5 Pneumococcal Conjugate Vaccine (PCV13) and Pneumococcal Polyaccharide Vaccine (PPSV23) are recommended for some children 6 through 18 years old with certain medical conditions that place them at high risk. Talk to your healthcare provider about pneumococcal vaccines and what factors may place your child at high risk for pneumococcal disease.
6 Hepatitis A vaccination is recommended for older children with certain medical conditions that place them at high risk. HepA vaccine is licensed, safe, and effective for all children of all ages. Even if your child is not at high risk, you may decide you want your child protected against HepA. Talk to your healthcare provider about HepA vaccine and what factors may place your child at high risk for HepA.

For more information, call toll free 1-800-CDC-INFO (1-800-232-4636) or visit http://www.cdc.gov/vaccines/teens
# 2014 Recommended Immunizations for Adults: By Age

If you are this age, **talk to your healthcare professional about these vaccines**

<table>
<thead>
<tr>
<th>Age</th>
<th>Flu</th>
<th>Tetanus, diphtheria, pertussis (Td/Tdap)</th>
<th>Shingles</th>
<th>Pneumococcal</th>
<th>Meningococcal</th>
<th>MMR</th>
<th>HPV</th>
<th>Chikungunya</th>
<th>Varicella</th>
<th>Hepatitis A</th>
<th>Hepatitis B</th>
<th>Hib</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 - 21 years</td>
<td></td>
<td></td>
<td></td>
<td>PCV13</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 - 26 years</td>
<td></td>
<td></td>
<td></td>
<td>PCV13</td>
<td>1 or 2 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 - 49 years</td>
<td></td>
<td></td>
<td></td>
<td>PCV13</td>
<td>1 or 2 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 - 59 years</td>
<td></td>
<td></td>
<td></td>
<td>PCV13</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 - 64 years</td>
<td></td>
<td></td>
<td></td>
<td>PCV13</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>65+ year</td>
<td></td>
<td></td>
<td></td>
<td>PCV13</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**More Information:**
- There are several flu vaccines available. Talk to your healthcare professional about which flu vaccine is right for you.
- If you are pregnant, you should get a Tdap vaccine during the 2nd trimester of every pregnancy to help protect your baby from pertussis (whooping cough).
- You should get a shingles vaccine even if you’ve had shingles before.
- There are two different types of pneumococcal vaccine: PCV13 (conjugate) and PPV23 (polysaccharide). Talk with your healthcare professional to find out if one or both pneumococcal vaccines are recommended for you.
- Your healthcare professional will let you know how many doses you need.

**Recommended For You:** This vaccine is recommended for you unless your healthcare professional tells you that you cannot safely receive it or that you do not need it.

**May Be Recommended For You:** This vaccine may be recommended for you if you have certain risk factors due to your health, jobs, or lifestyle that are not listed here. Talk to your healthcare professional to see if you need this vaccine.

**If you are traveling outside the United States, you may need additional vaccines.** Ask your healthcare professional about which vaccines you may need at least 6 weeks prior to your travel.

For more information, call 1-800-CDC-INFO (1-800-232-4636) or visit www.cdc.gov/vaccines

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This schedule was updated September 18, 2018 to reflect the latest pneumococcal vaccination recommendations from the Advisory Committee on Immunization Practices. www.cdc.gov/vaccines/acip/recs/pi/schedules

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[Image of CDC logo]
### 2014 Recommended Immunizations for Adults: By Health Condition

#### If you have this health condition, talk to your healthcare professional about these vaccines

<table>
<thead>
<tr>
<th>Condition</th>
<th>Flu (Influenza)</th>
<th>Td/Tdap (Tetanus, diphtheria, pertussis)</th>
<th>Shingles (Zoster)</th>
<th>Pneumococcal</th>
<th>Meningococcal</th>
<th>MMR (Mumps, measles, rubella)</th>
<th>HPV (Human papillomavirus)</th>
<th>Chickenpox</th>
<th>Hepatitis A</th>
<th>Hepatitis B</th>
<th>Hib (Haemophilus influenza type b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancy</td>
<td>每年注射流感疫苗。</td>
<td>目前有多种流感疫苗可供选择。</td>
<td>如有需要，请咨询您健康医务人员。</td>
<td>PCV13</td>
<td>PPSV23</td>
<td>-</td>
<td>需要根据您个人情况决定。</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Weakened Immune System</td>
<td>1剂Tdap每年注射</td>
<td>1剂Tdap每年注射</td>
<td>如有需要，请咨询您健康医务人员。</td>
<td>1剂</td>
<td>1剂</td>
<td>1剂</td>
<td>需要根据您个人情况决定。</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>HIV: CD4 count less than 200</td>
<td>1剂Tdap每年注射</td>
<td>1剂Tdap每年注射</td>
<td>如有需要，请咨询您健康医务人员。</td>
<td>1剂</td>
<td>1剂</td>
<td>1剂</td>
<td>需要根据您个人情况决定。</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>HIV: CD4 count 200 or greater</td>
<td>1剂Tdap每年注射</td>
<td>1剂Tdap每年注射</td>
<td>如有需要，请咨询您健康医务人员。</td>
<td>1剂</td>
<td>1剂</td>
<td>1剂</td>
<td>需要根据您个人情况决定。</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Kidney disease or poor kidney function</td>
<td>1剂Tdap每年注射</td>
<td>1剂Tdap每年注射</td>
<td>如有需要，请咨询您健康医务人员。</td>
<td>1剂</td>
<td>1剂</td>
<td>1剂</td>
<td>需要根据您个人情况决定。</td>
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</tr>
<tr>
<td>Asplenia (if you do not have a spleen or if it does not work well)</td>
<td>1剂Tdap每年注射</td>
<td>1剂Tdap每年注射</td>
<td>如有需要，请咨询您健康医务人员。</td>
<td>1剂</td>
<td>1剂</td>
<td>1剂</td>
<td>需要根据您个人情况决定。</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Heart disease</td>
<td>1剂Tdap每年注射</td>
<td>1剂Tdap每年注射</td>
<td>如有需要，请咨询您健康医务人员。</td>
<td>1剂</td>
<td>1剂</td>
<td>1剂</td>
<td>需要根据您个人情况决定。</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Chronic lung disease</td>
<td>1剂Tdap每年注射</td>
<td>1剂Tdap每年注射</td>
<td>如有需要，请咨询您健康医务人员。</td>
<td>1剂</td>
<td>1剂</td>
<td>1剂</td>
<td>需要根据您个人情况决定。</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Chronic alcoholism</td>
<td>1剂Tdap每年注射</td>
<td>1剂Tdap每年注射</td>
<td>如有需要，请咨询您健康医务人员。</td>
<td>1剂</td>
<td>1剂</td>
<td>1剂</td>
<td>需要根据您个人情况决定。</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Diabetes (Type 1 or Type 2)</td>
<td>1剂Tdap每年注射</td>
<td>1剂Tdap每年注射</td>
<td>如有需要，请咨询您健康医务人员。</td>
<td>1剂</td>
<td>1剂</td>
<td>1剂</td>
<td>需要根据您个人情况决定。</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Chronic Liver Disease</td>
<td>1剂Tdap每年注射</td>
<td>1剂Tdap每年注射</td>
<td>如有需要，请咨询您健康医务人员。</td>
<td>1剂</td>
<td>1剂</td>
<td>1剂</td>
<td>需要根据您个人情况决定。</td>
<td>-</td>
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</tr>
</tbody>
</table>

**More Information:**
- 有多种流感疫苗可供选择。询问您的健康医务人员选择适合您的疫苗。
- 如有需要，请咨询您健康医务人员。

**Recommended For You:** This vaccine is recommended for you unless your healthcare professional tells you that you cannot safely receive it or that you do not need it.

**May Be Recommended For You:** This vaccine is recommended for you if you have certain risk factors due to your age, health, job, or lifestyle that are listed here. Talk to your healthcare professional to see if you need this vaccine.

**YOU SHOULD NOT GET THIS VACCINE**

**For more information, call 1-800-CDC-INFO (1-800-232-4636) or visit www.cdc.gov/vaccines**

[CDC Logo]

CS211118
INFLUENZA
Influenza

- Influenza spreads to other people beginning 1 day before symptoms and up to 5 to 7 days after becoming sick.
- Children may shed the virus for longer than 7 days.
- Incubation period is 1 to 4 days.
- Some can be asymptomatic and still spread the virus.
Peak Month of Flu Activity
1982-83 through 2013-14
Flu hospitalization

• Highest among people 65 and older (50.9 per 100,000), people 50 to 64 years now have the second-highest hospitalization rate (38.7 per 100,000).
• Children 0-4 years old (35.9 per 100,000).
Influenza vaccine recommendations

• Routinely for all persons $\geq 6$ months of age (without contraindication)
• 6 months -8 years 2 doses $\geq 4$ weeks apart in their first season
• Vaccine content
  – Trivalent –A (H1N1)+A (H3 N2) + B (Yamagata)
  – Quadrivalent has same as above +B (Victoria lineage)
Figure 2. Influenza Vaccination Coverage Estimates by Influenza Season, Children 6 months-17 years, United States

Room for improvement
Figure 1. Seasonal Flu Vaccination Coverage, by Age Group and Season, United States, 2009-2014

Error bars represent 95% confidence intervals around the estimates. The 2009-10 estimates do not include the influenza A (H1N1) pdm09 monovalent vaccine. Starting with the 2011-12 season, adult estimates reflect changes in BRFSS survey methods: the addition of cellular telephone samples and a new weighting method.
Flu deaths

- Influenza deaths this season are following a pattern similar to the pandemic.
- **2009-2010**
  - People 25 years to 64 years of age
- 18%, 30%, and 47% for the three previous seasons, respectively.
Number of Influenza-Associated Pediatric Deaths by Week of Death: 2011-12 season to present

2011-12
Number of Deaths Reported = 37

2012-13
Number of Deaths Reported = 171

2013-14
Number of Deaths Reported = 110

2014-15
Number of Deaths Reported = 97

Week of Death
- Deaths Reported Previous Week
- Deaths Reported Current Week
Wondering about egg allergy???
Influenza vaccine and egg allergy

FIGURE 2. Recommendations regarding influenza vaccination of persons who report allergy to eggs — Advisory Committee on Immunization Practices, United States, 2014–15 influenza season

Can the person eat lightly cooked egg (e.g., scrambled egg) without reaction?*

Yes
Administer vaccine per usual protocol

No

After eating eggs or egg-containing foods, does the person experience ONLY hives?

Yes

After eating eggs or egg-containing foods, does the individual experience other symptoms such as:
- Cardiovascular changes (e.g., hypotension)
- Respiratory distress (e.g., wheezing)
- Gastrointestinal (e.g., nausea or vomiting)
- Reaction requiring epinephrine
- Reaction requiring emergency medical attention

Administer RIV3, if patient is aged 18 through 49 yrs OR
Administer IIV
Observe for reaction for at least 30 minutes after vaccination

No

Administer RIV3, if patient is aged 18 through 49 yrs
If RIV3 is not available, or patient is aged <18 years or >49 years, IIV should be administered by a physician with experience in the recognition and management of severe allergic conditions
Observe for reaction for at least 30 minutes after vaccination

Observe for 30 min
Pertussis
Reported pertussis incidence by age group: 1990-2014*

*2014 data are provisional.

SOURCE: CDC, National Notifiable Diseases Surveillance System and Supplemental Pertussis Surveillance System
Changes in Pertussis Reporting by State from 2011 to 2012* †

*Data for 2012 are provisional.
† Cases reported through Week 52 in 2011 were compared with cases reported through Week 52 in 2012; fold-changes were calculated for each state.
Changes in Pertussis Reporting by State from 2013 to 2014*

*Data for 2014 are provisional and subject to change. †Cases reported through Week 33 in 2013 were compared with cases reported through Week 23 in 2014.
**Reported Case Profiles, By Age**

<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; 6 mos</td>
<td>2,974</td>
<td>(10.4)</td>
<td>150.9</td>
</tr>
<tr>
<td>6-11 mos</td>
<td>797</td>
<td>(2.8 )</td>
<td>40.4</td>
</tr>
<tr>
<td>1-6 yrs</td>
<td>5,365</td>
<td>(18.7)</td>
<td>22.2</td>
</tr>
<tr>
<td>7-10 yrs</td>
<td>4,834</td>
<td>(16.9)</td>
<td>29.5</td>
</tr>
<tr>
<td>11-19 yrs</td>
<td>9,455</td>
<td>(33.0)</td>
<td>25.1</td>
</tr>
<tr>
<td>20+ yrs</td>
<td>5,119</td>
<td>(17.8)</td>
<td>2.2</td>
</tr>
<tr>
<td>Unknown</td>
<td>116</td>
<td>(0.4 )</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28,660</strong></td>
<td>(100.0)</td>
<td><strong>9.0</strong>*</td>
</tr>
</tbody>
</table>

*Total age incidence per 100,000 calculated from 28,544 cases with age reported.

Bordetella pertussis
<table>
<thead>
<tr>
<th>Stages</th>
<th>Length</th>
<th>Clinical feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catarrhal</td>
<td>7-10 days (4-21 days)</td>
<td>Coryza, mild cough</td>
</tr>
<tr>
<td>Paroxysmal</td>
<td>6 weeks (10 weeks)</td>
<td>Paroxysmal cough, vomit, exhaustion</td>
</tr>
<tr>
<td>Convalescent</td>
<td>7-10 days (4-21 days)</td>
<td>Slowly reduced cough</td>
</tr>
</tbody>
</table>

http://www.cdc.gov/pertussis/clinical/features.html
WHY THE SOUNDS OF PERTUSSIS MUST BE SILENCED??
**B. pertussis**

- <6 months age hospitalization is common
- The most common complication is bacterial pneumonia.
  - 50% will have apnea
  - 20% get pneumonia
- Pertussis causes about **10-20 deaths annually in US**

http://www.cdc.gov/pertussis/clinical/complications.html
Adolescent *B. pertussis*

- Can last for 10 weeks/100 days
  - Weight loss (33%)
  - Urinary incontinence (28%)
  - Syncope (6%)
  - Rib fractures from severe coughing (4%)
  - PCR can be negative after 3 weeks
Pertussis vaccine

- **Routine childhood** - DTaP
- **Tdap**
  - 11-18 years
  - All adults
  - Every pregnancy
- **Interval between Td and Tdap** can be <5 years
- **Then every 10 years Td**
Very young infants are dependent solely on maternal antibodies and lack the ability to mount a cell-mediated response (4). The effectiveness and optimal concentration of maternal antipertussis antibodies in newborns are not yet known, but high levels of antibodies in the first weeks after birth likely confer protection and might prevent pertussis or modify disease severity (5–7). Studies on the persistence of antipertussis antibodies following a dose of Tdap show antibody levels in healthy, nonpregnant adults peak during the first month after vaccination, with substantial antibody decay...
Pertussis & pregnancy

• Pregnancy
  -- Tdap
    27-36 weeks gestation
  Every pregnancy

  All care givers – **cocoon**
  • 2 weeks prior to arrival of neonate
  – Influenza vaccine
Cocooning

2008-2010
8334/11174 postpartum (75%) had Tdap
Median 2-3 contacts /infant
90% Latino

Barriers to full cocooning included
 Need for extended vaccination hours
 Inaccurate recall of vaccination history
 Sustainability, funding

Healy et al CID 2011
Silence the Whoop
Measles
Global measles

• In 1980 2.6 million deaths
• 2013 measles vaccine coverage 84% 1 dose
• In 2013 145,000 deaths
  – 400/day, 16/hr

75% reduction
Measles in USA

• 1963
  – 549,000 cases in US
  – 48,000 hospitalized
  – 495 deaths in US
  – 1000 disability (encephalitis)

In 2000 measles was eliminated in US
Measles

- Three C’s
- Cough, Coryza, Conjunctivitis
- Fever upto 105°F
- Incubation 7-21 days
- Rash 14 days after exposure
- Contagious 4 days before to 4 days after the rash
- No rash in Immunocompromised
Measles Cases and Outbreaks During 2014*

644 Cases
23 Outbreaks


representing 89% of reported cases this year

*Provisional data reported to CDC’s National Center for Immunization and Respiratory Diseases

Jan 1 to Mar 20th 2015
178 cases
4 outbreaks
In 17 states
The United States experienced a record number of measles cases during 2014, with 644 cases from 27 states reported to CDC’s National Center for Immunization and Respiratory Diseases (NCIRD). This is the greatest number of cases since measles elimination was documented in the U.S. in 2000.
Rate of Nonmedical Vaccine Exemptions By State
Percentage of kindergartners with nonmedical exemptions, 2012-13 school year

Note: Children with exemptions may still be vaccinated.
Source: Centers for Disease Control
Measles vaccination

• 2 doses
  – 12-15 months
  – 4-5 years
  – 28 days interval

• HCP documented immunity

• Contraindication
  – Pregnant, severe reaction, blood transfusion, low immunity (low platelets, HIV, cancer, immuno suppressants)
Vaccination Rates And The Spread Of Measles

If the local vaccination rate is **75-86%**

One Sick Child --- INFECTS --- 3 Others

If the local vaccination rate is **66-81%**

One Sick Child --- INFECTS --- 3 Others

If the local vaccination rate is **50-71%**

One Sick Child --- INFECTS --- 3 Others
Standing orders for measles

Standing Orders for Administering Measles, Mumps & Rubella Vaccine to Children & Teens

Purpose: To reduce morbidity and mortality from measles, mumps, and rubella by vaccinating all children and teens who meet the criteria established by the Centers for Disease Control and Prevention’s Advisory Committee on Immunization Practices.

Policy: Under these standing orders, eligible nurses and other healthcare professionals (e.g., pharmacists) where allowed by state law, may vaccinate children and teens who meet any of the criteria below.

Procedure:
1. Identify children and teens ages 12 months and older in need of vaccination against measles, mumps, and rubella.
2. Screen all patients for contraindications and precautions to measles, mumps, and rubella (MMR) vaccine:
   a. Contraindications:
      - a history of a serious reaction (e.g., anaphylaxis) after a previous dose of MMR vaccine or to one MMR vaccine component. For information on vaccine components, refer to the manufacturer’s package insert (www.immunize.org/package-insert) or go to www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/Blockencypt-table-2.pdf.
      - a recent receipt (within the previous 11 months) of antibody-containing blood product (specific interval depends on product).
      - a history of thrombocytopenia or thrombocytopenic purpura.
      - moderate or severe acute illness with or without fever.
   b. Precautions:
      - a recent receipt (within the previous 11 months) of antibody-containing blood product (specific interval depends on product).
      - a history of thrombocytopenia or thrombocytopenic purpura.
      - moderate or severe acute illness with or without fever.
3. Provide all patients or, in the case of a minor, their parent/legal representative, with a copy of the most current Federal Vaccine Information Statement (VIS). You must document, at the patient’s medical record or office log, the publication date of the VIS and the date it was given to the patient (parent/legal representative). Provide non-English speaking patients with a copy of the VIS in their native language, if available and preferred, these can be found at www.immunize.org/vis.
4. Provide routine vaccination with MMR vaccine at age 12-15 months and at 4-6 years. Administer 0.5 mL MMR vaccine intramuscularly (20-50 kg, 0.2 mL) in the posterosilateral arm of the upper arm.
5. For children and teens who have not received MMR vaccine at the ages specified above in #4, give one dose at the earliest opportunity and then schedule a second dose, if needed, by observing a minimum interval of 4 weeks between doses.
6. Document each patient’s vaccine administration information and follow up in the following places:
   a. Medical chart: Record the date the vaccine was administered, the manufacturer lot number, the vaccine name, the site and route, and the name and title of the person administering the vaccine. If vaccine was not given, record the reason(s) for non-receipt of the vaccine (e.g., medical contraindication, patient refusal).
   b. Personal immunization record card: Record the date of vaccination and the name/title of the administering clinician.
7. Be prepared for management of a medical emergency related to the administration of vaccine by having a written emergency medical protocol available, as well as equipment and medications. To prevent syncope in older children, vaccinate patients while they are seated or lying down and consider observing them for 15 minutes after receipt of the vaccine.

This policy and procedure shall remain in effect for all patients of the____________________________ until residual or until________________________ (date).

Medical Director’s signature:________________________ Effective date:________________________

For standing orders for other vaccines, go to www.immunize.org/standing-orders

Immunization Action Coalition 1573 6th Avenue - St. Paul, MN 55104 · 651-647-9009 · www.immunize.org · www.vaccineinformation.org
1 Tdap
2 Meningococcal
3 HPV
# Teen vaccine

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Do you need it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chickenpox (varicella; Var)</td>
<td>If you haven’t been vaccinated and haven’t had chickenpox, you need 2 doses of this vaccine. Anybody who was vaccinated with only 1 dose should get a second dose.</td>
</tr>
<tr>
<td>Hepatitis A (HepA)</td>
<td>You need 2 doses of hepatitis A vaccine if you would like to be protected from this disease or if you have a risk factor for hepatitis A. Check with your healthcare provider to find out if you need this vaccine.</td>
</tr>
<tr>
<td>Hepatitis B (HepB)</td>
<td>This vaccine is recommended for all people age 0–18 years. You need a series of doses of hepatitis B vaccine if you have not already received them.</td>
</tr>
<tr>
<td>Human papillomavirus (HPV)</td>
<td>All preteens and teens age 11 and older need 3 doses of HPV vaccine. The vaccine protects against HPV, the most common cause of cervical cancer. It also protects against some other types of cancers, such as cancer of the anus and penis.</td>
</tr>
<tr>
<td>Influenza (Flu)</td>
<td>Everyone age 6 months and older needs influenza vaccination every fall or winter and for the rest of their lives.</td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td>You need 2 doses of MMR vaccine if you have not already received them. MMR vaccine is usually given in childhood.</td>
</tr>
<tr>
<td>Meningococcal (MCV4)</td>
<td>All preteens and teens age 11–18 years need 2 doses of MCV4. If you are a first-year college student living in a residence hall, you need a dose of MCV4 if you have never received it or received it when you were younger than 16. Check with your healthcare provider.</td>
</tr>
<tr>
<td>Pneumococcal (PCV13, PPSV23)</td>
<td>Do you have a chronic health problem? If so, check with your healthcare provider to find out if you need the pneumococcal vaccine.</td>
</tr>
<tr>
<td>Polio (IPV)</td>
<td>You need a series of at least 3 doses of polio vaccine if you have not already received them. Polio vaccine is usually given in childhood.</td>
</tr>
<tr>
<td>Tetanus, diphtheria, and whooping cough (pertussis; Tdap)</td>
<td>All preteens and teens (and adults!) need a dose of Tdap vaccine, a vaccine that protects you from tetanus, diphtheria, and whooping cough (pertussis). After getting a dose of Tdap, you will need a tetanus-diphtheria (Td) shot every ten years. If you become pregnant, however, you will need another dose of Tdap during the pregnancy, preferably during the third trimester.</td>
</tr>
</tbody>
</table>

If you will be traveling outside the United States, additional vaccines may be needed. For information, consult your healthcare provider, a travel clinic, or the Centers for Disease Control and Prevention at [www.cdc.gov/travel](http://www.cdc.gov/travel).
Teen rate of vaccination

FIGURE. Estimated vaccination coverage with selected vaccines and doses among adolescents aged 13–17 years, by survey year — National Immunization Survey-Teen, United States, 2006–2013

Low for series completion
Nebraska Teen meningococcal Vaccination rate

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>80-81%</td>
</tr>
<tr>
<td>Rural</td>
<td>71%</td>
</tr>
<tr>
<td>White</td>
<td>79%</td>
</tr>
<tr>
<td>Latino</td>
<td>64%</td>
</tr>
</tbody>
</table>
### Meningococcal disease in USA by Serogroups 2002-2011

<table>
<thead>
<tr>
<th>Serogroup</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>402</td>
</tr>
<tr>
<td>C</td>
<td>305</td>
</tr>
<tr>
<td>Y</td>
<td>365</td>
</tr>
<tr>
<td>Others</td>
<td>76</td>
</tr>
<tr>
<td>Total</td>
<td>1146</td>
</tr>
</tbody>
</table>
Meningococcal

- *N. meningitidis*
  - 50% meningitis
  - 37.5% bacteremia
- Fatality 10-15%
  - 11-19% sequel loss of limbs, hearing loss etc
- Serogroups C, Y, W cause 70% of the disease
  - ACIP recommended vaccine available
- Serogroup B vaccine **new and FDA approved**
  - awaiting ACIP recommendation
  - 10-25 years
Meningococcal vaccine

- Vaccine immunity wanes after 1 dose
- Booster dose 16-18 years
- 850,000 doses no Guillain-Barre syndrome
- H/O of GBS is contraindication for vaccine
- Vaccine mandated in schools in 22 states
- MenB vaccines FDA approved 10-25 years
  - 3 dose series Trumenba
  - 2 dose Bexsero
Rates of Meningococcal Disease by Age Group and Burden of Disease, United States, Active Bacterial Core Surveillance System, 2003-2012

For more information visit: http://www.cdc.gov/abcs/index.html
ACIP recommends meningococcal vaccination for the following groups:

- Routine vaccination of adolescents aged 11 through 18 years (a single dose of vaccine should be administered at age 11 or 12 years, with a booster dose at age 16 years for persons who receive the first dose before age 16 years).

- Routine vaccination of persons aged ≥2 months at increased risk for meningococcal disease, including:
  - Persons aged ≥2 months with certain medical conditions such as anatomical or functional asplenia or complement component deficiency (dosing schedule and interval for booster dose varies by age at time of previous vaccination).
  - Special populations such as unvaccinated or incompletely vaccinated first-year college students living in residence halls, military recruits, or microbiologists with occupational exposure (indication for booster dose 5 years after prior dose if at continued risk).
  - Persons aged ≥9 months who travel to or reside in countries in which meningococcal disease is hyperendemic or epidemic, particularly if contact with the local population will be prolonged.

- Vaccination of persons in at-risk groups (see Appendix B) to control outbreaks.
Human Papilloma Virus Vaccine-HPV

• Cervical cancer is the second most common cancer in women
• HPV 16 and 18 cause
  – 70% of cervical cancer
  – 62% of oropharyngeal cancer
• HPV 6 and 11 cause 85-90% of genital warts.

- **Race**:
  - White: 7.4 per 100,000 females
  - Black: 9.9 per 100,000 females
  - AI/AN: 6.5 per 100,000 females
  - A/PI: 7.1 per 100,000 females

- **Ethnicity**:
  - Non-Hispanic: 7.4 per 100,000 females
  - Hispanic: 11.3 per 100,000 females

**Total**

- **Us 2010 11,818 cervical cancer 3939 deaths**

CDC 2004-2008
Estimated Annual Burden of HPV-Related Diagnoses in the United States

- **Vaginal cancer**: ~2,020\(^1,2\)
- **Vulvar cancer**: ~2,115\(^1,2\)
- **Anal cancer**: ~6,350\(^1,2,a\)
- **Cervical cancer**: ~12,340\(^1,2\)
- **High-grade cervical dysplasia**: ~280,500\(^2,3\)
- **Genital warts**: ~500,000–1,000,000\(^2,4,a\)
- **Low-grade cervical dysplasia**: ~1.1 million\(^2,3\)

Case counts for HPV-related diagnoses relate to approximately 40 HPV types, not just HPV 6, 11, 16, and 18.

\(^a\)Includes cases in both men and women.


\(^3\)Schiffman M et al., Arch Pathol Lab Med., 2003;127:946–949.

Average number of cancers and genital warts per year attributed to HPV infections, United States.

HPV attributable cancer cases

Data are from all states meeting USCS publication criteria for all years 2006–2010 and cover approximately 94.8% of the U.S. population.
ACIP Recommendations for HPV Vaccination:

ACIP outlines an age-based (vs. risk-based) vaccination policy\textsuperscript{1,2}

**Males: qHPV Vaccination\textsuperscript{1}**

- **Routine:** 11 or 12 year olds
- **Catch up:** 13–21 year olds
- **Special populations:** 22–26 year olds\textsuperscript{a}

**Females: HPV Vaccination\textsuperscript{2}**

- **Routine:** 11 or 12 year olds
- **Catch up:** 13–26 year olds

- Males and females: 9- and 10-year-olds can be vaccinated\textsuperscript{1,2}

---

\textsuperscript{1} ACIP = Advisory Committee on Immunization Practices; qHPV = quadrivalent HPV

\textsuperscript{a} See the ACIP Recommendations for further information about Special Populations

---


Estimated Vaccine Coverage for Adolescent by Age (NIS-Teen 2012) ¹

HPV=human papillomavirus; NIS=National Immunization Survey; HPV-1=1 or more doses of HPV vaccine; HPV-3=3 doses of HPV vaccine; MCV4=meningococcal conjugate vaccine (1 dose); Tdap=tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis (1 or more doses).

Based on NIS Survey, the majority of 13 year olds have not been vaccinated with HPV Vaccine

Age 13 HPV Vaccination Status 2012 (Females) ²ᵃ  
(N=9058)

- 53.2% Fully Vaccinated (3 doses)
- 20.2% Partially Vaccinated (1 or 2 doses)
- 26.6% Unvaccinated

Age 13 HPV Vaccination Status 2012 (Males) ²ᵃ  
(N=10,141)

- 80.5% Fully Vaccinated (3 doses)
- 12.9% Partially Vaccinated (1 or 2 doses)
- 6.6% Unvaccinated

ⅡPercent Estimates Based on National Immunization Survey (NIS) data. Teen NIS identifies individuals 13-17 years of age in the 50 states and District of Columbia using a random-digitaled sample.

Estimated vaccination coverage with selected vaccines and doses* among adolescents aged 13–17 years,† by state/area — National Immunization Survey–Teen (NIS-Teen), United States, 2012

**Nebraska**

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th></th>
<th></th>
<th>Male</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VAR</td>
<td>≥ 2</td>
<td>Tdap</td>
<td>≥1</td>
<td>HPV</td>
<td>≥1</td>
<td>HPV</td>
</tr>
<tr>
<td>Tdap</td>
<td>≥ 1</td>
<td>MenACWY</td>
<td>≥1</td>
<td>HPV</td>
<td>≥2</td>
<td>≥3</td>
</tr>
<tr>
<td>HPV</td>
<td>≥1</td>
<td>HPV</td>
<td>≥2</td>
<td>HPV</td>
<td>≥3</td>
<td>≥3</td>
</tr>
<tr>
<td>HPV</td>
<td>≥1</td>
<td>HPV</td>
<td>≥2</td>
<td>HPV</td>
<td>≥3</td>
<td>≥3</td>
</tr>
<tr>
<td>HPV</td>
<td>≥1</td>
<td>HPV</td>
<td>≥3</td>
<td>HPV</td>
<td>≥3</td>
<td>≥3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th></th>
<th></th>
<th>Male</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VAR</td>
<td>82.2</td>
<td>Tdap</td>
<td>81.4</td>
<td>HPV</td>
<td>75.5</td>
<td>HPV</td>
</tr>
<tr>
<td>Tdap</td>
<td>75.5</td>
<td>MenACWY</td>
<td>67.5</td>
<td>HPV</td>
<td>58.3</td>
<td>≥3</td>
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<tr>
<td>HPV</td>
<td>67.5</td>
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<td>37.3</td>
<td>HPV</td>
<td>19.6</td>
<td>≥2</td>
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<tr>
<td>HPV</td>
<td>58.3</td>
<td>HPV</td>
<td>11.6</td>
<td>HPV</td>
<td>11.6</td>
<td>≥3</td>
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<tr>
<td>HPV</td>
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<td>HPV</td>
<td>7.0</td>
<td>HPV</td>
<td>7.0</td>
<td></td>
</tr>
</tbody>
</table>
HPV vaccine

• Quadrivalvent and bivalent cover types 16 & 18 cancer causing types (70% of cervical cancer)
• HPV 4 covers 90% of wart types
• HPV 9 added 5 more (31,33,45,52 and 58)
  – Covers additional 15-20% cervical cancers and additional 5-20% other cancers
  – Efficacy 96.7%
  – FDA approved 2015
  – 3 dose 11-13 years

Joura et al NEJM 2015 372:711-23
## Pregnancy

<table>
<thead>
<tr>
<th>Routine</th>
<th>Tdap, Influenza</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>MMR, Varicella, Zostavax</td>
</tr>
<tr>
<td>High risk asplenia etc</td>
<td>Pneumococcal meningococcal</td>
</tr>
<tr>
<td>Other</td>
<td>Hep A, Hep B</td>
</tr>
<tr>
<td>Travel vaccines</td>
<td>Check travel advice</td>
</tr>
</tbody>
</table>
Pregnancy

• The flu shot is recommended during pregnancy by
  – Advisory Committee on Immunization Practices
  – American College of Obstetricians and Gynecologists.

• Over the years, millions of pregnant women have received a influenza vaccines
  – Safe for pregnant women and their babies.
Pregnancy

• Influenza vaccination rate improves if offered by the clinician
• It is safe and protects mother and infant
• Influenza vaccine coverage

<table>
<thead>
<tr>
<th>Year</th>
<th>Coverage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010-11</td>
<td>44.0</td>
</tr>
<tr>
<td>2011-12</td>
<td>46.4</td>
</tr>
<tr>
<td>2012-13</td>
<td>50.5</td>
</tr>
<tr>
<td>2013-14</td>
<td>52.2</td>
</tr>
</tbody>
</table>
Pregnancy and pertussis

- 40% of infants get it from mothers
- Vaccinate 2 weeks before the arrival of infant
- “Cocoon” by vaccinating all caregivers

The best time to get the shot is your 27th through 36th week of pregnancy.
Adult vaccination
Adult pneumococcal vaccine

• In 2013 **13,500 cases of invasive pneumococcal dz > 65 years of age**

• 20-25% of IPD and 10% of Community acquired pneumonia due to PCV 13 serotypes
Pneumococcal vaccines

- 6-18 years with immune deficiency and high risk factors
- Single dose of Prevnar 13
- PPS 23 ----5 years after first dose
ACIP recommendation 2014

**BOX. Sequential administration and recommended intervals for PCV13 and PPSV23 for adults aged ≥65 years — Advisory Committee on Immunization Practices, United States**

**Pneumococcal vaccine-naïve persons aged ≥65 years**

- PCV13 at age ≥65 years
- PPSV23
  - 6–12 months*

**Persons who previously received PPSV23 at age ≥65 years**

- PPSV23 already received at age ≥65 years
- PCV13
  - ≥1 years

**Persons who previously received PPSV23 before age 65 years who are now aged ≥65 years**

- PPSV23 already received at age <65 years
- PCV13 at age ≥65 years
- PPSV23
  - ≥1 years
  - 6–12 months*
  - ≥5 years

**Abbreviations:** PCV13 = 13-valent pneumococcal conjugate vaccine; PPSV23 = 23-valent pneumococcal polysaccharide vaccine.

*Minimum interval between sequential administration of PCV13 and PPSV23 is 8 weeks; PPSV23 can be given later than 6–12 months after PCV13 if this window is missed.

or by mail. Additional information about VAERS is available by telephone (1-800-822-7967) or online (http://vaers.hhs.gov).
<table>
<thead>
<tr>
<th>Table 1. Adults Who Need PPSV23 Vaccination[6]</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All adults aged 65 years or older</td>
</tr>
<tr>
<td>• Adults younger than 65 years with:</td>
</tr>
<tr>
<td>◦ Chronic lung disease (including chronic obstructive pulmonary disease, emphysema, and asthma)</td>
</tr>
<tr>
<td>◦ Chronic cardiovascular diseases</td>
</tr>
<tr>
<td>◦ Diabetes mellitus</td>
</tr>
<tr>
<td>◦ Chronic renal failure, the nephrotic syndrome</td>
</tr>
<tr>
<td>◦ Chronic liver disease (including cirrhosis), alcoholism</td>
</tr>
<tr>
<td>◦ Cochlear implants, cerebrospinal fluid leaks</td>
</tr>
<tr>
<td>◦ Immunocompromising conditions (including HIV)</td>
</tr>
<tr>
<td>◦ Functional/anatomical asplenia (including sickle cell disease and other hemoglobinopathies)</td>
</tr>
<tr>
<td>• Residents of nursing homes or long-term care facilities</td>
</tr>
<tr>
<td>• Smokers</td>
</tr>
<tr>
<td>When indicated, if uncertain of vaccination status, vaccinate</td>
</tr>
</tbody>
</table>

Source: Centers for Disease Control and Prevention (CDC)
Table 2. Adults Who Need PPSV23 Revaccination\textsuperscript{[6]}

All immunocompromised adults need one-time PPSV23 revaccination.

- For patients younger than 65 years:
  - One-time PPSV23 revaccination after 5 years for high risk:
    - Chronic renal failure, the nephrotic syndrome
    - Sickle cell disease
    - Splenectomy
    - Immunocompromised patients
  
- When previously vaccinated patients reach 65 years of age:
  - One-time PPSV23 revaccination, if more than 5 years have passed since the last vaccination and the patient was younger than 65 years at time of primary vaccination.

Source: Centers for Disease Control and Prevention (CDC)
Herpes zoster
Zostavax

- Zoster can cause
  - Post herpetic neuralgia
  - Hospitalization
  - Non-pain related complications
- FDA approved Herpes zoster vaccines for 50 years and above
- ACIP recommendation ≥60 years
- 70% efficacy in prevention
- Immunity may last 5 years
Health care provider

How are we doing with HCP vaccination??????
## HCP Recommendations

<table>
<thead>
<tr>
<th>Vaccines</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBV</td>
<td>3 doses, Ab test 1-2 months later if exposure risk. If titer &lt;10 redose x 3</td>
</tr>
<tr>
<td>Influenza</td>
<td>If not pregnant LAIV (if &lt;49 years) , annual, IIV if caring for IC pts.</td>
</tr>
<tr>
<td>MMR</td>
<td>Documented immunity or 2 doses 28 days apart Birth before 1957- 2 doses (measles, mumps out break)vs 1 dose (rubella outbreak)</td>
</tr>
<tr>
<td>Varicella</td>
<td>Documented dz or 2 doses 28 days apart</td>
</tr>
<tr>
<td>Tdap</td>
<td>1 dose Tdap to all, with each pregnancy. Td thereafter q 10 years</td>
</tr>
<tr>
<td>Meningococcal</td>
<td>Microbiologist MCV 4 and q 5 years if risk+</td>
</tr>
</tbody>
</table>
FIGURE. Percentage of health-care personnel (HCP)* who received influenza vaccination, by work setting and occupation type — Internet panel survey, United States, 2010–11 through 2013–14 influenza seasons

Work setting

- All health care facilities
- Hospital
- Other clinical setting
- Long-term care setting
- Ambulatory care/Physician’s office

Influenza season

% vaccinated

2010–11
2011–12
2012–13
2013–14
HCP

Area to address
How to Increase immunization rate!!

The starting point for improvement is to recognize the need. — Masaaki Imai
MISSED OPPORTUNITIES TO VACCINATE
I missed you...
What are “Missed Opportunities”

- A *missed opportunity* is a health care encounter in which a child is eligible to receive a vaccination but is not vaccinated.\(^1\)

Why do Missed Opportunities Occur?

- Provider does not know the patient is **due/eligible** for an immunization
- Provider’s or practice’s **policy** does not lead to vaccination
- Provider does not follow only **true** contraindications
- Vaccination records for patients should be recorded on a standard form in an easily **accessible** location in the medical record to facilitate rapid review of vaccination status.
Review every chart at every visit

- **Assign** someone to screen the vaccine record
- **Flag** the chart for immunization
- Vaccine **champion** in clinic
Provider to follow only true contraindications

- CDC pink book or the AAP red Book.
- For an example of a screening questionnaire for contraindications –
  [www.immunize.org/handouts/screening-vaccines.asp](www.immunize.org/handouts/screening-vaccines.asp)
Suggested ways to help improve

- Maximize opportunities to immunize
- Provide convenient office hours
- Revise office scheduling
- Use standing orders
- Educate office staff regarding contraindications
- Review office policy on parental consent
- Use an IIS
- Develop and maintain appropriate medical record keeping practices
Take home message

• Increase immunization rate
• Avoid missed opportunities
• Vaccinate
  – Kids
  – Teens
  – Pregnant
  – Adults
  – Travelers
• Complete the series
• Reminder recall
For More Information

• AAP
  www.aap.org/immunization

• CDC
  www.cdc.gov/vaccines

• National Network for Immunization Information
  www.nnii.org

• Vaccinate Your Baby
  www.vaccinateyourbaby.org

• Parents of Kids with Infectious Diseases
  www.pkids.org
• Do you have any questions about any vaccines?
The greatest glory in living lies not in never falling, but in rising every time we fall.

~ Nelson Rolihlahla Mandela