General Recommendations on Immunization

Montana Immunization Program

January 20, 2016
General Recommendations on Immunization
Recommendations of the Advisory Committee on Immunization Practices (ACIP)

Continuing Education Examination available at http://www.cdc.gov/mmwr/cmws/conted.html
General Recommendations on Immunization

An ACIP MMWR
- Timing and spacing
- Contraindications and precautions
- Preventing and managing adverse reactions to immunization
- Vaccine administration
- Storage and handling
- Altered immunocompetence
- Special situations
- Vaccination records
- Vaccination programs
- Vaccine information sources
Overview

- **Timing and Spacing**
  - Antibody containing blood products
  - Different vaccines
  - Doses of the same vaccine

- **Contraindications and Precautions**
  - Adverse Events vs Adverse Reactions
  - Specific contraindications and precautions
    - Pregnancy
    - Altered Immunocompetence
      - HIV infection
      - Hematopoietic Cell Transplant

- **Preventing and Managing Adverse Reactions**
  - Risk benefit communication
  - Syncope
Timing and Spacing: Antibody-containing Blood Products

- Used to restore a needed component of blood
- Provide a passive immune response following disease exposure
- Concurrent administration of antibody containing blood product and vaccine?
Antibody and Live Vaccines

General Rule

- Inactivated vaccines are generally not affected by circulating antibody to the antigen.
- Live, attenuated vaccines might be affected by circulating antibody to the antigen – an effectiveness concern.
## Antibody Products and Measles- and Varicella- containing Vaccines

<table>
<thead>
<tr>
<th>Product given first</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccine</td>
<td>Wait 2 weeks before giving antibody</td>
</tr>
<tr>
<td>Antibody</td>
<td>Wait at least 3 months before giving vaccine</td>
</tr>
</tbody>
</table>
## Interval Between Antibody-containing Products and Measles- and Varicella-containing Vaccines

### Recommended intervals between administration of immune globulin preparations and measles- or varicella-containing vaccine

<table>
<thead>
<tr>
<th>Product / Indication</th>
<th>Dose, including mg Immunoglobulin G (IgG)/kg body weight</th>
<th>Recommended Interval before measles or varicella-containing vaccine administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood transfusion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Red blood cells (RBCs), washed</td>
<td>10 mL/kg (negligible IgG/kg) IV</td>
<td>None</td>
</tr>
<tr>
<td>- RBCs, adenine-saline added</td>
<td>10 mL/kg (10 mg IgG/kg) IV</td>
<td>3 months</td>
</tr>
</tbody>
</table>
| - Packed RBCs (hematocrit 55%)
| - Whole blood (hematocrit 35%-50%)
| - Plasma/platelet products | 10 mL/kg (60-100 mg IgG/kg) IV | 6 months |
| - Plasma/platelet products | 10 mL/kg (160 mg IgG/kg) IV | 7 months |
| Botulinum Immune Globulin Intravenous (Human) | 1.5 mL/kg (75 mg IgG/kg) IV | 6 months |
| Cytomegalovirus IGIV | 150 mg/kg maximum | 6 months |
| Hepatitis A IG        |                                                          |                                                                                  |
| - Contact prophylaxis | 0.02 mL/kg (3.3 mg IgG/kg) IM | 3 months |
| - International travel | 0.06 mL/kg (10 mg IgG/kg) IM | 3 months |
| Hepatitis B IG (HBIG) |                                                          |                                                                                  |
| IGIV                  |                                                          |                                                                                  |
| - Replacement therapy for immune deficiencies
| - Immune thrombocytopenic purpura treatment
| - Measles IG, contact prophylaxis (immunocompromised contact)
| - Postexposure varicella prophylaxis
| - Immune thrombocytopenic purpura treatment
| Measles IG, contact prophylaxis
| - Standard (i.e., nonimmunocompromised contact) | 0.5 mL/kg (80 mg IgG/kg) IM | 6 months |
| Monoclonal antibody to respiratory syncytial virus F protein (Synagis™)
| Rabies IG (RIG) | 20 IU/kg (22 mg IgG/kg) IM | 4 months |
| Tetanus IG (TIG) | 250 units (10 mg IgG/kg) IM | 3 months |
| Varicella IG | 125 units/10 kg (60-200 mg IgG/kg) IM, maximum 625 units | 5 months |
## Spacing of Antibody-containing Products and MMR and Varicella Vaccines

<table>
<thead>
<tr>
<th>Product</th>
<th>Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washed red blood cells</td>
<td>0 months</td>
</tr>
<tr>
<td>Hepatitis A (IG)</td>
<td>3 months</td>
</tr>
<tr>
<td>Measles prophylaxis (IG) (immunocompetent recipient)</td>
<td>6 months</td>
</tr>
<tr>
<td>Plasma/platelet products</td>
<td>7 months</td>
</tr>
<tr>
<td>Intravenous immune globulin (IGIV)</td>
<td>7-11 months</td>
</tr>
</tbody>
</table>
Products Containing Type-specific or Negligible Antibody

- **Palivizumab (Synagis)**
  - Contains only monoclonal RSV antibody
  - Does not interfere with live virus vaccination

- **Red blood cells (RBCs), washed**
  - Negligible antibody content
Exceptions to the General Rule

- Antibody-vaccine spacing recommendations apply specifically to MMR and varicella-containing vaccines

- Does NOT apply to:
  - Zoster vaccine (large amount of virus in the vaccine)
  - Yellow fever, oral typhoid (negligible antibody in the U.S. blood supply)
  - LAIV (viruses change annually)
  - Rotavirus (replication in GI tract)
Interval Between Doses of Different Vaccines

- Simultaneous administration
- Non-simultaneous administration
Simultaneous Administration

General Rule

- All vaccines can be administered at the same visit as all other vaccines

Exceptions:
- PCV13 and PPSV23: Give PCV13 first
- MCV4-D (Menactra only) and PCV13 in asplenic children: Give PCV13 first
Non-simultaneous Administration: Live-vaccine Effectiveness

<table>
<thead>
<tr>
<th>Combination</th>
<th>Minimum Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 live injected or live intranasal influenza vaccine</td>
<td>4 weeks</td>
</tr>
<tr>
<td>All other</td>
<td>None</td>
</tr>
</tbody>
</table>
Spacing of Live Vaccines Not Given Simultaneously

- If 2 live parenteral or intranasal vaccines are given less than 28 days apart, the vaccine given 2\textsuperscript{nd} should be repeated.

- Immune response from 1\textsuperscript{st} vaccine interferes with replication of 2\textsuperscript{nd} vaccine.

- One exception: yellow fever vaccine and single-antigen measles vaccine.
Interval Between Doses of the Same Vaccine
Intervals Between Doses

General Rule

- **Increasing** the interval between doses of a multidose vaccine **does not** diminish the effectiveness of the vaccine.
Extended Interval Between Doses

- Not all permutations of all schedules for all vaccines have been studied
- Available studies of extended intervals have shown no significant difference in final titer
- It is not necessary to restart the series or add doses because of an extended interval between doses
Intervals Between Doses

General Rule

- **Increasing** the interval between doses of a multidose vaccine does not diminish the effectiveness of the vaccine.

- **Decreasing** the interval between doses of a multidose vaccine may interfere with antibody response and protection.
### Appendix A

#### Recommended and Minimum Ages and Intervals Between Doses of Routinely Recommended Vaccines

<table>
<thead>
<tr>
<th>Vaccine and dose number</th>
<th>Recommended age for this dose</th>
<th>Minimum age recommended for this dose</th>
<th>Recommended interval to next dose</th>
<th>Minimum interval to next dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphtheria-tetanus-acellular pertussis (DTaP)-1</td>
<td>2 months</td>
<td>6 weeks</td>
<td>8 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>DTaP-2</td>
<td>4 months</td>
<td>10 weeks</td>
<td>8 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>DTaP-3</td>
<td>6 months</td>
<td>14 weeks</td>
<td>6-12 months</td>
<td>6 months</td>
</tr>
<tr>
<td>DTaP-4</td>
<td>15-15 months</td>
<td>15 months</td>
<td>3 years</td>
<td>6 months</td>
</tr>
<tr>
<td>DTaP-5</td>
<td>4-6 years</td>
<td>4 years</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Haemophilus influenzae type b (Hib)-1</td>
<td>2 months</td>
<td>6 weeks</td>
<td>8 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Hib-2</td>
<td>4 months</td>
<td>10 weeks</td>
<td>8 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Hib-3</td>
<td>6 months</td>
<td>14 weeks</td>
<td>6-8 months</td>
<td>8 weeks</td>
</tr>
<tr>
<td>Hib-4</td>
<td>12-15 months</td>
<td>12 months</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Hepatitis A (HepA)-1</td>
<td>12-23 months</td>
<td>12 months</td>
<td>6-18 months</td>
<td>6 months</td>
</tr>
<tr>
<td>HepA-2</td>
<td>18 months</td>
<td>18 months</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Hepatitis B (HepB)-1</td>
<td>Birth</td>
<td>Birth</td>
<td>4 weeks-4 months</td>
<td>4 weeks</td>
</tr>
<tr>
<td>HepB-2</td>
<td>1-2 months</td>
<td>4 weeks</td>
<td>8 weeks-17 months</td>
<td>8 weeks</td>
</tr>
<tr>
<td>HepB-3</td>
<td>6-18 months</td>
<td>24 weeks</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Herpes zoster (HZV)-1</td>
<td>60 years</td>
<td>60 years</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Human papillomavirus (HPV)-1</td>
<td>11-12 years</td>
<td>9 years</td>
<td>8 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>HPV-2</td>
<td>11-12 years</td>
<td>9 years</td>
<td>4 months</td>
<td>12 weeks</td>
</tr>
<tr>
<td>HPV-3</td>
<td>11-12 years</td>
<td>9 years</td>
<td>12 weeks &amp; 26 weeks</td>
<td>---</td>
</tr>
<tr>
<td>Influenza, inactivated (IV)</td>
<td>6 months</td>
<td>6 months</td>
<td>4 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Influenza, live attenuated (LAIV)</td>
<td>2-40 years</td>
<td>2 years</td>
<td>4 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Measles-mumps-rubella (MMR)-1</td>
<td>12-15 months</td>
<td>12 months</td>
<td>3-5 years</td>
<td>4 weeks</td>
</tr>
<tr>
<td>MMR-2</td>
<td>4-6 years</td>
<td>13 months</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Meningococcal conjugate (MCV)-1</td>
<td>11-12 years</td>
<td>6 weeks</td>
<td>4-5 years</td>
<td>8 weeks</td>
</tr>
<tr>
<td>MCV-2</td>
<td>16 years</td>
<td>11 years</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Meningococcal polysaccharide (MPSV)-1</td>
<td>2 years</td>
<td>6 years</td>
<td>5 years</td>
<td>5 years</td>
</tr>
<tr>
<td>MPSV-2</td>
<td>---</td>
<td>7 years</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Pneumococcal conjugate (PCV)-1</td>
<td>2 months</td>
<td>6 weeks</td>
<td>8 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>PCV-2</td>
<td>4 months</td>
<td>10 weeks</td>
<td>8 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>PCV-3</td>
<td>6 months</td>
<td>14 weeks</td>
<td>6 months</td>
<td>8 weeks</td>
</tr>
<tr>
<td>PCV-4</td>
<td>12-15 months</td>
<td>12 months</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Pneumococcal polysaccharide (PPSV)-1</td>
<td>2 years</td>
<td>5 years</td>
<td>5 years</td>
<td>---</td>
</tr>
<tr>
<td>PPSV-2</td>
<td>---</td>
<td>7 years</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Poliovirus, Inactivated (IPV)-1</td>
<td>2 months</td>
<td>6 weeks</td>
<td>8 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>IPV-2</td>
<td>4 months</td>
<td>10 weeks</td>
<td>8-14 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>IPV-3</td>
<td>6 months</td>
<td>14 weeks</td>
<td>3-5 years</td>
<td>6 months</td>
</tr>
<tr>
<td>IPV-4</td>
<td>6 months</td>
<td>4 weeks</td>
<td>8 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Rotavirus (RV)-1</td>
<td>2 months</td>
<td>6 weeks</td>
<td>8 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>RV-2</td>
<td>4 months</td>
<td>10 weeks</td>
<td>8 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>RV-3</td>
<td>6 months</td>
<td>14 weeks</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Tetanus-diphtheria (Td)</td>
<td>11-12 months</td>
<td>7 years</td>
<td>10 years</td>
<td>5 years</td>
</tr>
<tr>
<td>Tetanus-diphtheria-acellular pertussis (Tdap)</td>
<td>12-15 months</td>
<td>7 years</td>
<td>3-5 years</td>
<td>12 weeks</td>
</tr>
<tr>
<td>Varicella (Var)-1</td>
<td>12-15 months</td>
<td>12 months</td>
<td>3-5 years</td>
<td>12 weeks</td>
</tr>
<tr>
<td>Var-2</td>
<td>4-6 years</td>
<td>15 months</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

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Centers for Disease Control and Prevention  
Epidemiology and Prevention of Vaccine-Preventable Diseases, 13th Edition  
April, 2015

Appendix A-13
<table>
<thead>
<tr>
<th>Vaccine and dose number</th>
<th>Recommended age for this dose</th>
<th>Minimum age for this dose</th>
<th>Recommended interval to next dose</th>
<th>Minimum interval to next dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphtheria-tetanus-acellular pertussis (DTaP)-1&lt;sup&gt;5&lt;/sup&gt;</td>
<td>2 months</td>
<td>6 weeks</td>
<td>8 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>DTaP-2</td>
<td>4 months</td>
<td>10 weeks</td>
<td>8 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>DTaP-3</td>
<td>6 months</td>
<td>14 weeks</td>
<td>6-12 months</td>
<td>6 months&lt;sup&gt;6&lt;/sup&gt;</td>
</tr>
<tr>
<td>DTaP-4</td>
<td>15-18 months</td>
<td>15 months&lt;sup&gt;7&lt;/sup&gt;</td>
<td>3 years</td>
<td>6 months</td>
</tr>
<tr>
<td>DTaP-5</td>
<td>4-6 years</td>
<td>4 years</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><em>Haemophilus influenza</em> type b (Hib)-1&lt;sup&gt;3,8&lt;/sup&gt;</td>
<td>2 months</td>
<td>6 weeks</td>
<td>8 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Hib-2</td>
<td>4 months</td>
<td>10 weeks</td>
<td>8 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Hib-3&lt;sup&gt;9&lt;/sup&gt;</td>
<td>6 months</td>
<td>14 weeks</td>
<td>6-9 months</td>
<td>8 weeks</td>
</tr>
<tr>
<td>Hib-4</td>
<td>12-15 months</td>
<td>12 months</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Hepatitis A (HepA)-1</td>
<td>12-23 months</td>
<td>12 months</td>
<td>6-18 months</td>
<td>6 months</td>
</tr>
</tbody>
</table>
Minimum Intervals and Ages

- Vaccine doses should not be administered at intervals less than the minimum intervals or earlier than the minimum age.
When Can Minimum Intervals Be Used?

- Catch-up for a lapsed vaccination schedule
- Impending international travel
- NOT to be used routinely
The “Grace Period”

- ACIP recommends that vaccine doses given up to four days before the minimum interval or age be counted as valid
- Should not be used for scheduling future vaccination visits
- Use for reviewing vaccination records

*MMWR 2011;60(RR-2)*
Use of the “Grace Period”

- To schedule a future appointment: NO!
- When evaluating a vaccination record: Yes
- Patient is in the office or clinic early: Maybe
Use of the “Grace Period”

- **Patient is in the office or clinic**
  - Patient/parent is known and dependable
  - Patient/parent is unknown or undependable

  **Reschedule**

  **Vaccinate**
Violations of Minimum Intervals and Minimum Ages

- Grace period may conflict with some state school entry requirements
- Immunization programs and/or school entry requirements may not accept some or all doses given earlier than the minimum age or interval, particularly varicella and/or MMR vaccines
- Providers should comply with local and/or state immunization requirements
Violations of Minimum Intervals and Minimum Ages

- Minimum interval/age has been violated
  - Dose invalid
- The repeat dose should be administered at least a minimum interval from the invalid dose
The “Pediarix Challenge”

- Off-schedule administration could lead to 2 potential invalid doses:
  - Hepatitis B birth dose (HepB1)
  - Pediarix at 2 months (HepB2)
  - Pediarix at 5 months (invalid HepB-age younger than 24 weeks)
  - Pediarix at 6 months (invalid HepB-interval since last dose less than 8 weeks)

- CDC does NOT recommend a 5th dose of Hepatitis B vaccine in this situation
Contraindications and Precautions
Vaccine Adverse Reaction

- **Adverse reaction**
  - Extraneous effect caused by vaccine
  - “Side effect"
Vaccine Adverse Reaction

- **Adverse reaction**
- **Adverse event**
  - Any medical event following vaccination
  - May be true adverse reaction
  - May be only coincidental
Vaccine Adverse Event Reporting System (VAERS)

- Reports from public and private sectors
- Providers should report any clinically significant adverse event that occurs after a vaccine, even if unsure whether or not the vaccine caused the event
- Providers may also report vaccine administration errors
- 1-800-822-7967 or online at www.vaers.hhs.gov
Vaccine Adverse Event Reporting System (VAERS)

- Jointly administered by CDC and FDA
- National reporting system
- Passive - depends on healthcare providers and others to report
- Receives ~30,000 reports per year

http://vaers.hhs.gov/
Types of Vaccine Adverse Reactions

- Local
- Systemic
- Allergic (least frequent)
Vaccine Adverse Reactions

- **Local**
  - Pain, swelling, redness at site of injection
  - Common with inactivated vaccines
  - Usually mild and self-limited
Vaccine Adverse Reactions

- **Local**
- **Systemic**
  - Fever, malaise, headache
  - Nonspecific
  - May be unrelated to vaccine
Live, Attenuated Vaccines

- Must replicate to produce immunity
- Symptoms usually mild
- Occur after an incubation period (usually 3-21 days)
Vaccine Adverse Reactions

- **Local**
- **Systemic**
- **Allergic**
  - Due to vaccine or vaccine component
  - Rare
  - Risk minimized by screening
Contraindication

- A condition in a recipient which greatly increases the chance of a serious adverse event
A condition in a recipient which may increase the chance or severity of an adverse event

OR

May compromise the ability of the vaccine to produce immunity
Contraindications and Precautions

Permanent contraindications

- Severe allergic reaction to a prior dose of vaccine or to a vaccine component
Contraindications and Precautions

Permanent contraindications

- **Rotavirus vaccines only**
  - Severe Combined Immunodeficiency disease (SCID)
  - History of intussusception

- **Pertussis vaccines only**
  - Encephalopathy not due to another identifiable cause occurring within 7 days of pertussis vaccination
## Contraindications and Precautions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Live</th>
<th>Inactivated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergy to component</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Encephalopathy</td>
<td>___</td>
<td>C</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>C</td>
<td>V*</td>
</tr>
<tr>
<td>Immunosuppression</td>
<td>C</td>
<td>V</td>
</tr>
<tr>
<td>Moderate/severe illness</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Recent blood product</td>
<td>P**</td>
<td>V</td>
</tr>
</tbody>
</table>

C=contraindication  
P=precaution  
V=vaccinate if indicated  
*Except HPV  
**MMR and varicella-containing (except zoster vaccine and LAIV)
### Guide to Contraindications and Precautions to Commonly Used Vaccines

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Contraindications</th>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B (HepB)</td>
<td>• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component</td>
<td>• Moderate or severe acute illness with or without fever</td>
</tr>
<tr>
<td></td>
<td>• Infant weighing less than 2000 grams (4 lbs, 6 oz)</td>
<td>• Infant weighing less than 2000 grams (4 lbs, 6 oz)</td>
</tr>
<tr>
<td>Rotavirus (RV1 [Rotarix])</td>
<td>• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component</td>
<td>• Altered immunocompetence other than SCID</td>
</tr>
<tr>
<td></td>
<td>• Severe combined immunodeficiency (SCID)</td>
<td>• Chronic gastrointestinal disease</td>
</tr>
<tr>
<td></td>
<td>• History of intussusception</td>
<td>• Sepsis (biliary or bladder)</td>
</tr>
<tr>
<td>Diphtheria, tetanus, pertussis (D TaP)</td>
<td>• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component</td>
<td>• Moderate or severe acute illness with or without fever</td>
</tr>
<tr>
<td></td>
<td>• For pertussis-containing vaccines: encephalopathy (e.g., coma, decreased level of consciousness, prolonged seizures) not attributable to another identifiable cause within 7 days of administration of a previous dose of DTaP or DTaP (or DT) or of previous dose of DTP/DTaP or Td (for Td)</td>
<td>• Guillain-Barre syndrome (GBS) within 6 weeks after a previous dose of tetanus toxoid-containing vaccine</td>
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<td>• History of Arthus-type hypersensitivity reactions after a previous dose of tetanus or diphtheria toxoid-containing vaccine; defer vaccination until at least 10 years have elapsed since the last tetanus toxoid-containing vaccine</td>
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<td>For DTaP only:</td>
<td>• For DTaP only:</td>
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<td>• Temperature of 105°F or higher (40.5°C or higher) within 48 hours after vaccination with a previous dose of DTP/DTaP</td>
<td>• Collapse or shock-like state (e.g., hypotensive hypertensive episode) within 48 hours after receiving a previous dose of DTP/DTaP</td>
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<td>• Collapse or shock-like state (e.g., hypotensive hypertensive episode) within 48 hours after receiving a previous dose of DTP/DTaP</td>
<td>• Seizure within 24 hours after receiving a previous dose of DTP/DTaP</td>
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<td>• Collapse or shock-like state (e.g., hypotensive hypertensive episode) within 48 hours after receiving a previous dose of DTP/DTaP</td>
<td>• Persistent, intractable crying lasting 3 or more hours within 48 hours after receiving a previous dose of DTP/DTaP</td>
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<tr>
<td>Haemophilus influenzae type b (Hib)</td>
<td>• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component</td>
<td>• Moderate or severe acute illness with or without fever</td>
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<td>• Age younger than 6 weeks</td>
<td>• Age younger than 6 weeks</td>
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<tr>
<td>Inactivated poliovirus vaccine (IPV)</td>
<td>• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component</td>
<td>• Moderate or severe acute illness with or without fever</td>
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<td>• Influenza A (H1N1)</td>
<td>• Pregnancy</td>
</tr>
<tr>
<td>Pneumococcal vaccine (PCV13 or PPV23)</td>
<td>• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component</td>
<td>• Moderate or severe acute illness with or without fever</td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td>• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component</td>
<td>• Moderate or severe acute illness with or without fever</td>
</tr>
<tr>
<td></td>
<td>• Known severe immunodeficiency (e.g., from hematologic and solid tumors, receipt of chemotherapy, congenital immunodeficiency, or long-term immunosuppressive therapy) or patients with human immunodeficiency virus (HIV) infection who are severely immunocompromised</td>
<td>• Seizure within 24 hours after receiving a previous dose of DTP/DTaP</td>
</tr>
<tr>
<td>Varicella (Var)</td>
<td>• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component</td>
<td>• Moderate or severe acute illness with or without fever</td>
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<td>• Known severe immunodeficiency (e.g., from hematologic and solid tumors, receipt of chemotherapy, congenital immunodeficiency, or long-term immunosuppressive therapy) or patients with human immunodeficiency virus (HIV) infection who are severely immunocompromised</td>
<td>• Seizure within 24 hours after receiving a previous dose of DTP/DTaP</td>
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<td>• Pregnancy</td>
<td>• Seizure within 24 hours after receiving a previous dose of DTP/DTaP</td>
</tr>
<tr>
<td>Hepatitis A (HepA)</td>
<td>• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component</td>
<td>• Moderate or severe acute illness with or without fever</td>
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</tbody>
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*Continued on page 2*
Vaccination During Pregnancy

- Live vaccines should not be administered to women known to be pregnant
- In general, inactivated vaccines may be administered to pregnant women for whom they are indicated
- HPV vaccine should be deferred during pregnancy
Vaccination During Pregnancy

- **Inactivated vaccines**
  - **Routine**
    - Influenza – any trimester
    - Tdap – 27 to 36 weeks
  - **Vaccinate if indicated** (HepA, HepB)
  - **Vaccinate if increased risk** (all others except HPV)
  - **Provider discretion** (PCV13, Hib, MenB)
Vaccination of Immunosuppressed Persons

- Live vaccines should not be administered to severely immunosuppressed persons

- Persons with isolated B-cell deficiency may receive varicella or zoster vaccine

- Inactivated vaccines are safe to use in immunosuppressed persons, but the response to the vaccine may be decreased
Defining Immunosuppression

- Disease
  - Primary Immunodeficiency Diseases
    - Isolated B-cell deficiency
    - Combined lymphocyte deficiency (B and T cell)
    - Complement deficiency
    - Phagocyte deficiency
  - HIV infection / AIDS
  - Blood cancer
    - Leukemia
    - Lymphoma
    - Multiple myeloma
  - Generalized malignancy (metastatic) cancer
Defining Altered Immunocompetence (ACIP)

- Medication induced
  - "Traditional" anticancer therapies
  - Iso-antibody therapy
  - Immune mediator therapy
  - Corticosteroids
  - Specific therapy for solid organ transplant antitumor rejection
  - Specific therapy for hematopoietic cell transplant
Corticosteroids and Immunosuppression

- The amount or duration of corticosteroid therapy needed to increase adverse event risk is not well-defined

- **Dose generally believed to be a concern:**
  - 20 mg or more/day of prednisone for 2 weeks or longer
  - 2 mg/kg per day or more of prednisone for 2 weeks or longer
Corticosteroids and Immunosuppression

- Does NOT apply to aerosols, topical, alternate-day, short courses (less than 2 weeks), physiologic replacement schedules

- Delay live vaccines for at least 1-3 month after discontinuation of high-dose therapy
Vaccination of Immunocompromised Persons

Safety:

- Immunocompromised persons are at increased risk of adverse events following live vaccines
- Live vaccines may be administered at least 3 months following termination of chemotherapy (at least 1 month after high-dose steroid use of 2 weeks or more)
- LAIV, MMR, varicella, and rotavirus vaccines may be administered to susceptible household and other close contacts
Vaccination of Immunocompromised Persons

- Safety and efficacy

- Anti-tumor necrosis factor inhibitors
  - Generally can treat like steroids
  - Some experts recommend waiting longer than one month after vaccination with live or inactivated vaccines

- Other isoantibodies (e.g. lymphocyte depleting agents)
  - Some experts recommend up to six months
Defining Immunosuppression

“The degree of altered immunocompetence in a patient should be determined by a physician.”
Vaccination of Hematopoietic Cell Transplant (HCT) Recipients

- Antibody titers to VPDs decline during the 1-4 years after allogeneic or autologous HCT if the recipient is not revaccinated.

- HCT recipients are at increased risk of some VPDs, particularly due to encapsulated bacteria.

- Revaccination recommended beginning 6-24 months post-transplant.

*MMWR 2000;49(RR-10)*
Vaccination of HCT Recipients

- Inactivated influenza vaccine at least 4-6 months following transplant and annually thereafter

- Inactivated vaccines (DTaP, Td, IPV, PCV13, PPSV23, Hepatitis B, Hib, HPV, MCV4) at 6 months

- MMR, varicella, yellow fever vaccines at 24 months if immunocompetent

Preventing and Managing Adverse Reactions
Screening Questionnaire for Child and Teen Immunization

For parents/guardians: The following questions will help us determine whether your child can be vaccinated. If you answer "yes" to any question, it does not necessarily mean your child cannot be vaccinated. It just means additional questions must be asked. If a question is answered "yes," please contact your healthcare provider to explain it.

1. Is the child sick today?
2. Does the child have allergies to medications, food, a vaccine component, or is the child allergic to latex or anaphylaxis?
3. Has the child had a serious reaction to a vaccine in the past?
4. Has the child had a health problem with lung, heart, kidney or metabolic disease (e.g., diabetes), asthma, or a blood disorder? Is he/she on long-term aspirin therapy?
5. If the child to be vaccinated is between the ages of 2 and 4 years, has a healthcare provider told you that the child has wheezing or asthma in the past 12 months?
6. Has the child, a sibling, or a parent had a seizure? Has the child had or been treated for a nervous system problem?
7. Does the child have cancer, leukemia, AIDS, or any other immune system problem?
8. In the past 3 months, has the child taken cortisone, prednisone, other steroids, or antibiotics, or had radiation treatments?
9. In the past year, has the child received a transfusion of blood or blood products or been given immune (gamma) globulin or an antiviral drug?
10. Has the child had a health problem with lung, heart, kidney, or metabolic disease (e.g., diabetes), asthma or a blood disorder? Is he/she on long-term aspirin therapy?
11. Has the child received vaccinations in the past 4 weeks?

Form completed by:
Form reviewed by:

Did you bring your child’s immunization record card with you?

It is important to have a personal record of your child’s vaccinations. If you don’t have a copy of your child’s immunization record, you can give us your child’s immunization record card or have your child’s healthcare provider give it to us with all your child’s immunizations on it. Keep this record safe! You will need it every time you seek medical care for your child. Your child will need the immediate record of her immunizations for school, employment, or for international travel.

Information for Health Professionals about the Screening Questionnaire for Child & Teen Immunization

Are you interested in knowing why we included a certain question on the Screening Questionnaire? If so, read the information below. If you want to find out more, just contact the nurses listed at the bottom of this page.

1. Is the child sick today? [allergic or not]
   - This is important to know if the child is under the care of a healthcare provider and may influence the decision on whether or not to vaccinate.

2. Does the child have allergies to medications, food, a vaccine component, or is the child allergic to latex or anaphylaxis?
   - This question is important because some vaccines contain components that may cause allergic reactions.

3. Has the child had a serious reaction to a vaccine in the past?
   - A history of a severe reaction to a vaccine can be a contraindication to further doses of that vaccine.

4. Has the child had a health problem with lung, heart, kidney or metabolic disease (e.g., diabetes), asthma, or a blood disorder? Is he/she on long-term aspirin therapy?
   - These conditions may affect the child’s immune system and vaccine responses.

5. If the child to be vaccinated is between the ages of 2 and 4 years, has a healthcare provider told you that the child has wheezing or asthma in the past 12 months?
   - This information may be relevant to the child’s response to certain vaccines.

6. Has the child, a sibling, or a parent had a seizure? Has the child had or been treated for a nervous system problem?
   - Seizures and nervous system conditions may affect vaccine responses.

7. Does the child have cancer, leukemia, AIDS, or any other immune system problem?
   - Children with certain immune deficiencies may have a reduced response to vaccines.

8. In the past 3 months, has the child taken cortisone, prednisone, other steroids, or antibiotics, or had radiation treatments?
   - Certain medications and treatments can affect the immune system and vaccine responses.

9. In the past year, has the child received a transfusion of blood or blood products or been given immune (gamma) globulin or an antiviral drug?
   - These treatments can affect the immune system and vaccine responses.

10. Is the child on long-term aspirin therapy?
    - Aspirin can affect the immune system and vaccine responses.

11. Has the child received vaccinations in the past 4 weeks?
    - Recent vaccinations can affect the immune system and vaccine responses.

References:
Benefit and Risk Communication

- Opportunities for questions should be provided before each vaccination

- Vaccine Information Statements (VISs)
  - Must be provided before each dose of vaccine
  - Public and private providers
  - Available in multiple languages
Your Source for VISs
www.immunize.org

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<th>VISs by language</th>
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<tr>
<td>English</td>
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JENNY MCCARTHY
Fighting for My Autistic Son
In an emotional memoir the star describes Evan’s devastating diagnosis, his surprising breakthrough—and how Jim Carrey helped her heal
Communicating with Parents

- **For providers:**
  - If provider recommends it, parents more likely to follow
  - Ask, acknowledge, and advise
  - Start at prenatal visit, develop trust
  - Offer reliable resources
  - Know the science
  - Do not get defensive
Communicating with Parents

What parents want:
- Delayed vs. alternate schedules
- Facts and statistics
- Trust good websites
- Do not want to be talked down to
- Unbiased, non-coercive, credible, non-judgmental information
Childhood Immunization Schedule and Safety

- **Institute of Medicine - Mission**
  - Review scientific findings and stakeholder concerns related to the safety of the recommended childhood immunization schedule
  - Identify potential research approaches, methodologies, and study designs that could inform this question
  - Issue a summary report

- **Findings**
  - IOM committee finds no evidence that the schedule is unsafe
  - Following the complete childhood immunization schedule is strongly associated with reducing vaccine-preventable diseases
  - Committee calls for continued study of the immunization schedule using existing data systems

[www.iom.edu/childimmunizationschedule](http://www.iom.edu/childimmunizationschedule)
Syncope

Vasovagal reaction

Can occur after vaccination or any other anxiety provoking activity
Syncope

• Since 2001, 666 reports of syncope reported to VAERS
• 80% of reports occur in the first 15 minutes of vaccination
• Increasing reports since 2005, coincident with vaccines recommended for adolescents
Syncope and Head Injury

- Concerning public health issue is head injury following syncope
- 76% of VAERS reports of head injury following syncope occur in adolescents
Syncope and CDC's General Recommendations

- Adolescents and adults should be seated during vaccination
- Consider a 15 minute waiting period following vaccination of adolescents
CDC Vaccines and Immunization Resources

- Questions? E-mail CDC
  - nipinfo@cdc.gov or www.cdc.gov/cdcinfo

- Website www.cdc.gov/vaccines
- HCP www.cdc.gov/vaccines/hcp
- General Recommendations http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6002a1.htm
- Vaccines, 6th edition, eds. Plotkin, Orenstein, Offit