Vaccine Administration Techniques
and
Strategies for Improving Vaccine Uptake

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NW Immunization Conference | AUGUST 13, 2019
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.

THEN
Annual US disease cases in the 1900s

MEASLES
THEN 530,217 Cases
NOW 61

MUMPS
THEN 162,344 Cases
NOW 2,528

RUBELLA
THEN 47,745 Cases
NOW 6

CRS
THEN 152
NOW 0

TETANUS
THEN 200,752
NOW 21,291

DIPHTHERIA
THEN 21,053
NOW 0

SMALLPOX
THEN 29,005
NOW 0

HAEMOPHILUS INFLUENZAE
THEN 20,000
NOW 270

NOW
US disease cases in 2010

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Objectives

• Provide up-to-date information on best practices for vaccine administration.

• Understand common vaccine administration errors and how to prevent them.

• Discuss ways to optimize vaccine coverage and reduce missed opportunities to vaccinate.

• Become familiar with available resources and tools.
Vaccine Administration

**Preparation**
Staff training, written order / standing orders, VIS statements, infection prevention, forecasting, screen for contraindications/precautions, discuss vaccine to be given with patient or parent

**Administer the vaccine properly**
Preparing vaccines, injection sites, correct route, proper needle gauge and length, positioning, comfort measures/pain management techniques

**After the vaccines**
Monitor patient for adverse reactions, documentation, provide education
Staff Training and Education

Who can administer vaccines?

- All states allow physicians, nurse practitioners and physician’s assistants to both assess the need for and administer vaccines.
- All states allow RNs and LPNs to administer vaccines.
- Most states allow medical assistants (MAs) to give injections after training and with supervision.
- All states allow pharmacists to assess the need for and administer vaccines if they have received training and certification.

(Checklist and training handouts, videos, etc. available at immunize.org or CDC website)
Standing Orders

Standing Orders streamline practice workflow by eliminating the need to obtain an individual physician’s order to vaccinate each patient.

How to determine whether doses of oral polio vaccine administered outside the United States are valid (trivalent OPV).10

- Polio vaccine given outside the United States is valid if written documentation indicates that all doses were given after 6 weeks of age and the vaccine received was IPV or trivalent OPV (tOPV).
- If the record indicates OPV, and the dose was given prior to April 1, 2016, it can be counted as a valid tOPV dose.
- If the dose was administered April 1 through April 30, 2016, it can be counted as valid only if the record indicates that it was trivalent (tOPV).
- If the dose was administered on or after May 1, 2016, it should not be counted as a valid dose for the U.S. polio vaccination schedule because it was bivalent or monovalent vaccine rather than trivalent.
- Persons younger than 18 years of age with doses of OPV that do not count towards the U.S. vaccination requirements should receive IPV to complete the schedule according to the U.S. IPV schedule.

Check for updated Standing Orders on a regular basis.

Current Standing Orders are available at www.immunize.org and state websites
Can vaccines be given without an order?

_Vaccines must always be dispensed with a prescription or order from a physician or other healthcare provider authorized by the state to prescribe medications._

_Vaccines can be administered using a standing order. The prescriber does not have to be physically present for the vaccine to be administered._
ACIP Recommended Immunization Schedules

Table 1
Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger
United States, 2019

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>0-1 mo</th>
<th>2 mo</th>
<th>4 mo</th>
<th>6 mo</th>
<th>12 mo</th>
<th>15 mo</th>
<th>16 mo</th>
<th>17-18 mo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis A (IgG)</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotavirus (VRL, 2 dose series)</td>
<td></td>
<td></td>
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<tr>
<td>Diphtheria, tetanus, &amp; pertussis</td>
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<tr>
<td>Pneumococcal conjugate (PCV13)</td>
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<tr>
<td>Influenza (IIV)</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Influenza (LAIV)</td>
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<tr>
<td>Measles, mumps, rubella (MMR)</td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>Varicella (VAR)</td>
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<tr>
<td>Poliovirus (IPV)</td>
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<tr>
<td>Rotavirus (IVR, 2 dose series)</td>
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<tr>
<td>Pneumococcal conjugate (PPSV23)</td>
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<tr>
<td>Varicella (VZV)</td>
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<tr>
<td>Zoster recombiant (RZV) (preferred)</td>
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<td></td>
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<tr>
<td>Zoster live (ZV)</td>
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<td></td>
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<tr>
<td>Human papilloma virus (HPV)</td>
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<td></td>
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<tr>
<td>Hepatitis A (IgM)</td>
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<td></td>
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<tr>
<td>Measles, mumps, rubella (MMR)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Tetanus, diphtheria, &amp; pertussis</td>
<td></td>
<td></td>
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<tr>
<td>Human papilloma virus (HPV)</td>
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<tr>
<td>Pneumococcal B</td>
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<td></td>
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<tr>
<td>Pneumococcal conjugate (PCV13)</td>
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<td></td>
</tr>
</tbody>
</table>

Table 2
Recommended Adult Immunization Schedule by Age Group
United States, 2019

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>19-23 years</th>
<th>22-64 years</th>
<th>25-49 years</th>
<th>50-64 years</th>
<th>≥65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza inactivated (IIV) or</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Influenza recombinant (RII)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Influenza live attenuated (LAIV)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triclos, diphtheria, pertussis (Bipap II)</td>
<td>1 dose annually</td>
<td>1 dose annually</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td>1 or 2 doses depending on indication (if born in 1957 or later)</td>
<td>1 or 2 doses depending on indication (if born in 1957 or later)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella (VAR)</td>
<td></td>
<td>2 doses (if born in 1980 or later)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoster recombiant (RZV) (preferred)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoster live (ZV)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human papilloma virus (HPV)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>2 or 3 doses depending on age at initial vaccination</td>
<td>2 or 3 doses depending on age at initial vaccination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Human papilloma virus (HPV)</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal conjugate (PCV13)</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
<td></td>
<td>1 or 2 doses depending on indication</td>
<td>1 or 2 doses depending on indication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A (IgM)</td>
<td></td>
<td>2 or 3 doses depending on vaccine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis B (IgG)</td>
<td></td>
<td>2 or 3 doses depending on vaccine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Menengococcal A, C, W, Y (MenACW/Y)</td>
<td></td>
<td>1 or 2 doses depending on indication</td>
<td>1 or 2 doses depending on indication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Menengococcal B (Men)</td>
<td></td>
<td>2 or 3 doses depending on vaccine and indication</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenza type b (HiB)</td>
<td></td>
<td>1 or 3 doses depending on indication</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

www.cdc.gov/vaccines/schedules
Assess for Needed Immunizations

Use the current Advisory Committee on Immunization Practices (ACIP) immunization schedule to determine what recommended vaccines are needed based on the patient’s immunization history.

• Using immunization information system if available.
• Electronic Medical Record Systems
• 2019 ACIP Immunization Schedules for Children, Adolescents & Adults
• Minimum Interval and Age Table
Which Vaccines for Travel? (wwwnc.cdc.gov/travel/)

Health Information for Travelers to Costa Rica
Clinician View

On This Page
- Vaccines and Medicines
- Non-Vaccine-Preventable Diseases
- Patient Counseling
- Healthy Travel Packing List
- Travel Health Notices
- Advising Returning Travelers

Vaccines and Medicines

Prepare travelers to Costa Rica with recommendations for vaccines and medications.

<table>
<thead>
<tr>
<th>Vaccines</th>
<th>Recommendations</th>
<th>Transmission</th>
<th>Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine vaccines</td>
<td>Recommended for all travelers</td>
<td>varied</td>
<td>Immunization schedules</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>Recommended for most travelers, including those with &quot;standard&quot; itineraries and accommodations</td>
<td>Fecal-oral route (contaminated food and water)</td>
<td>Hepatitis A (Yellow Book)</td>
</tr>
</tbody>
</table>
We frequently see patients who are sick and are due for vaccinations. Should we give them the vaccines?

A mild illness such as diarrhea or mild upper-respiratory tract infection with or without fever is not a contraindication and vaccines may be given.

A moderate or severe illness is a precaution for administering vaccines as a fever following the vaccine could complicate management of the concurrent illness.

Treatment with antibiotics is not a valid reason to defer vaccination if the child or adult is otherwise well or has only a minor illness.
Live – Attenuated

Vaccine contains living microorganisms that have been altered so that don’t cause disease.

- Strong immune response
- More difficult to produce

(For example: MMR, MMRV, Varicella, Zoster)

Inactivated

Vaccine contains microorganisms that have been killed by heat, chemicals or radiation; or pieces of microorganisms that still elicit an immune response.

- Weaker immune response – usually requires multiple doses or “boosters” to get full immunity.
- Easy to produce.
General Rule
Simultaneous Administration

All vaccines can be administered at the same visit as all other vaccines.
Live vaccines must be administered on the same day or separated by at least 28 days.

If two live vaccines are not given simultaneously, the vaccine given second should be repeated ≥ 28 days later.
General Rule
Intervals Between Doses

- **Increasing** the interval between doses of a multi-dose vaccine series does not diminish the effectiveness of the vaccine.

- **Decreasing** the interval between doses of a multi-dose vaccine series may interfere with antibody response and protection.
General Rule
Minimum Ages and Intervals

Vaccine doses should not be given earlier than the minimum age or sooner than the minimum interval between doses.

From www.immunize.org
ACIP recommends that vaccine doses given up to four days before the minimum interval be counted as valid (4 day grace period).

This rule does not apply to 28 days needed between 2 doses of a live vaccine.
### Screening for Contraindications/Precautions

**Screening Checklist for Contraindications to Vaccines for Adults**

- Are you sick today?
- Do you have allergies to medications, foods, or vaccine components or latex?
- Have you ever had a serious reaction after receiving a vaccination?
- Do you have a long-term health problem with heart, lung, kidney, or metabolic disease (e.g., diabetes, asthma, a blood disorder, the immune system)? Are you on long-term antibiotic therapy?
- Do you or any of your family members have cancer, leukemia, HIV/AIDS, or other immune system problems?
- Have you ever had Guillain-Barre Syndrome or any other encephalomyelitis?
- Are you pregnant or breastfeeding?

**Guide to Contraindications and Precautions to Commonly Used Vaccines**

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Contraindications</th>
<th>Precautions</th>
</tr>
</thead>
</table>
| Hepatitis B (HepB) | • Severe allergic reaction (e.g., anaphylaxis) after a previous dose to or a vaccine component  
• Hypersensitivity to yeast | • Severe reaction with or without fever 
• Infant weighing less than 3000 grams (6 lbs, 6 oz) |
| Rotavirus (RV5) [Rotarix], RV1 [Rotavirus]) | • Severe allergic reaction (e.g., anaphylaxis) after a previous dose to or a vaccine component  
• Combined immunodeficiency (SCID)  
• History of intussusception | • Moderate or severe acute illness with or without fever 
• Allergic to immunocompetent or SCID |
| Tetanus, diphtheria, pertussis (DTaP) | • Severe allergic reaction (e.g., anaphylaxis) after a previous dose to or a vaccine component  
• 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 (for DTaP), or of previous dose of DTaP, DTaP, or DTaP (for DTaP)  
• For diphtheria and tetanus only: Progressive or unstable neurologic disease (including encephalopathy)  
• Diphtheria or tetanus toxoid-containing vaccine, defer vaccination until at least 10 years have elapsed since the last tetanus toxoid-containing vaccine | • Moderate or severe acute illness with or without fever 
• Chorea gravidarum or serious muscle disease |
| Haemophilus influenzae type b (HiB) | • Severe allergic reaction (e.g., anaphylaxis) after a previous dose to or a vaccine component  
• Age younger than 6 weeks | • Moderate or severe acute illness with or without fever |
| Inactivated poliovirus vaccine (IPV) | • Severe allergic reaction (e.g., anaphylaxis) after a previous dose to or a vaccine component | • Moderate or severe acute illness with or without fever 
• Pregnancy |
| Hepatitis A (HepA) | • Severe allergic reaction (e.g., anaphylaxis) after a previous dose to or a vaccine component | • Moderate or severe acute illness with or without fever |

Available at immunize.org or CDC website
Vaccine Information Statements (VIS)

The appropriate VIS must be given:

• Prior to vaccination (and prior to each dose of a multi-dose series).

• Regardless of age of the person being vaccinated.

• Regardless of whether the vaccine is given in a public or private healthcare setting.

• To the patient in a language the patient or parent can understand, whenever possible. Translations are available in more than 30 languages.

To verify that a VIS was given, providers must record in the patient’s medical record – edition date of the VIS and date it was provided.
Vaccine Preparation

- Prepare vaccines in a clean, designated medication area away from patient
- Ensure needed supplies are available
- Hand hygiene
- Select separate needle and syringe for each injection.
- ALWAYS check expiration dates on the vaccine and diluent.
- Prepare vaccines only when you are ready to administer them.

Only administer vaccines YOU have prepared.
Is it okay to draw up vaccines at the beginning of the shift? If it isn’t how much in advance can this be done?

The ACIP discourages the practice of prefilling vaccine into syringes, primarily because of the increased possibility of administration and dosing errors. An exception may be considered when only a single type of vaccine is to be administered during a clinic (e.g. influenza).
A Word about Diluents...

### Vaccines with Diluents: How to Use Them

Be sure to reconstitute the following vaccines correctly before administering them! Reconstitution means that the lyophilized (freeze-dried) vaccine powder or wafer in one vial must be reconstituted (mixed) with the diluent (liquid) in another.

- Only use the diluent provided by the manufacturer for that vaccine as indicated on the chart.
- ALWAYS check the expiration date on the diluent and vaccine. NEVER use expired diluent or vaccine.

<table>
<thead>
<tr>
<th>Vaccine product name</th>
<th>Manufacturer</th>
<th>Lyophilized vaccine (powder)</th>
<th>Liquid diluent (may contain vaccine)</th>
<th>Time allowed between reconstitution and use, as stated in package insert</th>
<th>Diluent storage environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>ActHIB (Hib)</td>
<td>Sanofi Pasteur</td>
<td>Hib</td>
<td>0.4% sodium chloride</td>
<td>24 hrs</td>
<td>Refrigerator</td>
</tr>
<tr>
<td>Hibercex (Hib)</td>
<td>GlaxoSmithKline</td>
<td>Hib</td>
<td>0.9% sodium chloride</td>
<td>24 hrs</td>
<td>Refrigerator</td>
</tr>
<tr>
<td>Innovax (RAβ)</td>
<td>Sanofi Pasteur</td>
<td>Rabies virus</td>
<td>Sterile water</td>
<td>Immediately</td>
<td>Refrigerator</td>
</tr>
<tr>
<td>M-M-R II (MMR)</td>
<td>Merck</td>
<td>MMR</td>
<td>Sterile water</td>
<td>8 hrs</td>
<td>Refrigerator or room temp</td>
</tr>
<tr>
<td>Menveo (MenACWY)</td>
<td>GlaxoSmithKline</td>
<td>MenA</td>
<td>Men CWY</td>
<td>8 hrs</td>
<td>Refrigerator</td>
</tr>
<tr>
<td>Pentacel (DTαP+IPV/Hib)</td>
<td>Sanofi Pasteur</td>
<td>Hib</td>
<td>DTαP+IPV</td>
<td>Immediately</td>
<td>Refrigerator</td>
</tr>
<tr>
<td>ProQuad (MMRV)</td>
<td>Merck</td>
<td>MMRV</td>
<td>Sterile water</td>
<td>30 min</td>
<td>Refrigerator or room temp</td>
</tr>
<tr>
<td>RabAvert (RAβ)</td>
<td>GlaxoSmithKline</td>
<td>Rabies virus</td>
<td>Sterile water</td>
<td>Immediately</td>
<td>Refrigerator</td>
</tr>
<tr>
<td>Rotarix (RV1)</td>
<td>GlaxoSmithKline</td>
<td>RV1</td>
<td>Sterile water, calcium carbonate, and xanthan</td>
<td>24 hrs</td>
<td>Refrigerator or room temp</td>
</tr>
<tr>
<td>Shingrix (RZV)</td>
<td>GlaxoSmithKline</td>
<td>RZV</td>
<td>ADSORBED ADJUVANT SUSPENSION</td>
<td>6 hrs</td>
<td>Refrigerator</td>
</tr>
<tr>
<td>Varivax (VAR)</td>
<td>Merck</td>
<td>VAR</td>
<td>Sterile water</td>
<td>30 min</td>
<td>Refrigerator or room temp</td>
</tr>
<tr>
<td>YF-VAX (YF)</td>
<td>Sanofi Pasteur</td>
<td>YF</td>
<td>0.9% sodium chloride</td>
<td>60 min</td>
<td>Refrigerator or room temp</td>
</tr>
<tr>
<td>Zostavax (ZVL)</td>
<td>Merck</td>
<td>LZV</td>
<td>Sterile water</td>
<td>30 min</td>
<td>Refrigerator or room temp</td>
</tr>
</tbody>
</table>

Reconstitute vaccine just prior to administration.
Are vaccine diluents interchangeable?

*Diluents are not interchangeable, except for sterile water used in Merck’s MMR, MMRV, varicella and live zoster vaccines.*

*If the wrong diluent is used, the dose is invalid and the vaccination should always be repeated as soon as possible.*
When patients need multiple vaccines (such as influenza and pneumococcal), can we just combine them in the same syringe?

Absolutely not!!! No vaccines should ever be mixed in the same syringe unless the combination has been specifically approved by the FDA.
Do we need to wait for the vaccine to reach room temperature before we administer it to a patient? 

*There is no recommendation to wait until a vaccine reaches room temperature before administration. The vaccine should be administered as soon as it is prepared.*
Positioning: Comfort Hold

For **Infants and Toddlers** who are getting a vaccine in a leg, parents can:

- Hold the child on their lap.
- Place the child’s arms under one of their own arms and around their back and apply gentle pressure for a secure, hug-like hold.
- Use their free arm and hand to hold the child’s other arm gently but securely.
- Anchor the child’s feet firmly with hand or between own thighs.

For **Older Children** who are getting a vaccine in an arm, parents can:

- Hold their child on their lap, or have the child stand in front of the seated parent.
- Embrace their child during the process.
- Anchor both of the child’s legs between their thighs.
Routes of Administration

**Intramuscular (IM)**
- Injected into muscle tissue

**Subcutaneous (SC)**
- Injected into the area just beneath the skin into the fatty, connective tissue

**Others**
- **Oral (PO)** – Administered by mouth
- **Intranasal (IN)** – Administered into the nose
- **Intradermal (ID)** – Injected into layers of the skin

[Diagram showing injection angles and tissue layers]
IM Injections

Administer these vaccines via IM route

- *Haemophilus influenzae* type b (Hib)
- Hepatitis A (HepA)
- Hepatitis B (HepB)
- Human papillomavirus (HPV)
- Influenza vaccine, injectable (IIV)
- Influenza vaccine, recombinant (RIV3; RIV4)
- Meningococcal conjugate (MenACWY)
- Meningococcal serogroup B (MenB)
- Pneumococcal conjugate (PCV13)
- Pneumococcal polysaccharide (PPSV23) – may also be given Subcut
- Polio (IPV) – may also be given Subcut
- Tetanus, diphtheria (Td), or with pertussis (Tdap)
- Zoster, recombinant (RZV; Shingrix)
Avoiding Shoulder Injury

Too High!

Too Low!
Acromion Process

- Measure 2 finger widths down from the acromion process (knobby top of arm)
- Imagine an inverted triangle starting from this point
- The injection site is the center of the triangle.

Acromion Process

- Place index finger on the acromion process (knobby top of arm)
- Place thumb at the bottom of the deltoid muscle.
- The injection site is midway between these points.
SQ Injections

Administer these vaccines via Subcut route
- Measles, mumps, rubella (MMR)
- Pneumococcal polysaccharide (PPSV23) – may also be given IM
- Polio (IPV) – may also be given IM
- Varicella (Var; chickenpox)
- Zoster, live (ZVL; Zostavax)

Children and Adults

- acromion process (bony prominence above deltoid)
- Subcut injection site (shaded area)
- elbow

Infants and Toddlers

- Subcut injection site (shaded area)
Why are some vaccinations given subcutaneously (SC) while others must be given intramuscularly (IM)?

In general, vaccines containing adjuvants (a component that enhances the antigenic response) are administered IM to avoid irritation, induration, skin discoloration, inflammation, and granuloma formation if injected into the subcutaneous tissue. This includes most of the inactivated vaccines.

Vaccine efficacy may also be reduced if not given by the recommended route.
Do you need to aspirate before giving a vaccination?

No. ACIP does not recommend aspiration when administering vaccines because no data exist to justify the need for this practice. There are data that show that aspiration is more painful for the vaccine recipient.
Is it safe to give a vaccine directly into an area where there is a tattoo?

Both IM and SC vaccines may be given through a tattoo.
Oral Administration

- Give first, before injections
- Do not use a needle
- Place the tip of the applicator just inside the infant's cheek
- Administer all of the vaccine
- Dispose in biohazard or sharps container
- Does not need to be repeated if spits up or vomits
- Infant can eat or drink immediately after receiving the vaccine
How many vaccines can be given during an office visit?

*All vaccines can be administered at the same visit. There is no upper limit for the number of vaccines that can be administered during one visit.*
Giving Multiple Injections
Under 12 Months

Consider....
- Is there an appropriate combination vaccine available?
- Pain Management
  - DTaP and PCV are likely to cause a greater local reaction – administer in separate limbs
  - PCV is more painful – administer last

From AIM Toolkit – www.aimtoolkit.org
Giving Multiple Injections
12 months and older

Consider...
- Is there an appropriate combination vaccine available?
- Pain Management
  - DTaP and PCV are likely to cause a greater local reaction – administer in separate limbs
  - MMR & PCV are more painful – administer last

From AIM Toolkit – www.aimtoolkit.org
Giving Multiple Injections
Adolescents

Consider...

Pain Management

- Tdap and MenACWY are likely to cause a greater local reaction – administer in separate limbs
- HPV is more painful – administer last

MenB (IM)
(Bexsero, Trumenba)
HPV (IM)
Tdap (IM)

Seasonal Influenza (IM)
MenACWY (IM)
(Menactra, Menevo)

VAR (SC)

Give other vaccines as needed (to bring up-to-date, high-risk): MMR (SC), HepA (IM), PCV13 (IM), and PPSV23 (IM)

From AIM Toolkit – www.aimtoolkit.org
Pain Management / Comfort Measures

**Psychological:**
- Lots of positive reinforcement
- Parent participation
- Always tell the truth – “Quick pinch and then it’s over.”
- Distraction
- Breastfeeding, swaddling, swaying

**Physical:**
- Upright position
- Rub skin
- Ingestion of sweet liquids
- Most painful injection last

**Pharmacological:**
- Topical analgesics
- Cooling of the injection site
Research shows that two shots are not more likely to induce cortisol (as a marker for stress) than one shot.
After the Shots

Observe patient for 15 minutes

• Keep seated
• Watch for signs of syncope & allergic reaction
• Provide care as needed

Provide education

• Discomfort may occur
• Comfort measures

Documentation

Know where your emergency kit is located and always bring one with you to outreach/off-site vaccination clinics.
Common Vaccine Administration Errors

- Administering vaccine to the **wrong-age** patient
- Administering the **wrong vaccine** to the patient.

http://eziz.org/assets/docs/IMM-508.pdf
The 7 Rights of Vaccine Administration

✓ Right Patient
✓ Right Time*
✓ Right Vaccine (and Diluent)
✓ Right Dosage
✓ Right Route, Needle Length, Technique
✓ Right Site for route indicated
✓ Right Documentation

* Correct age, appropriate interval, and administer before vaccine or diluent expires.

Strategies to Improve Vaccine Uptake

- **Building a positive immunization culture**
  Make vaccines a priority, identify a vaccine champion, ensure everyone feels comfortable talking about vaccines, participate in AFIX, provide on-going education

- **Using data and engaging staff**
  Ensure reliable data, regular data review, share with staff, barriers to vaccination discussion, run ALERT or EMR assessment reports

- **High impact strategies to improve coverage**
  Strong recommendation, facilitated review, reminder/recall, preschedule next appointment before the patient leaves the office, follow-up with “no-shows”, reduce barriers
Building a Positive Immunization Culture

- Empower all staff with education and motivation!
- Consider vaccines at every visit!
- Parents are an important part of the effort!
- Put technology to work!
Putting Technology to Work

There's gotta be a better way to visualize data than through interpretive dance.
Reliable Data is VERY Useful

• Ensure ALL vaccines administered are entered in Electronic Medical Record and Immunization Registry
• Request historical immunization records and enter them in a timely manner
• Inactive patients no longer being seen by clinic
An Example...

**Age Appropriate Benchmarks**

<table>
<thead>
<tr>
<th>Age (Months)</th>
<th>Bend Clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>87.2%</td>
</tr>
<tr>
<td>7</td>
<td>78.5%</td>
</tr>
<tr>
<td>9</td>
<td>73.3%</td>
</tr>
<tr>
<td>12</td>
<td>80.6%</td>
</tr>
<tr>
<td>16</td>
<td>84.7%</td>
</tr>
<tr>
<td>19</td>
<td>49.5%</td>
</tr>
<tr>
<td>21</td>
<td>67.6%</td>
</tr>
<tr>
<td>24</td>
<td>70.3%</td>
</tr>
</tbody>
</table>

**Two Year Old Immunization Rates**

<table>
<thead>
<tr>
<th>Age (Months)</th>
<th>Bend Clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/1/2016</td>
<td>87.2%</td>
</tr>
<tr>
<td>10/31/2016</td>
<td>78.5%</td>
</tr>
<tr>
<td>4/28/2017</td>
<td>73.3%</td>
</tr>
<tr>
<td>10/31/2017</td>
<td>80.6%</td>
</tr>
<tr>
<td>4/30/2018</td>
<td>84.7%</td>
</tr>
<tr>
<td>10/31/2018</td>
<td>49.5%</td>
</tr>
<tr>
<td>4/30/2019</td>
<td>67.6%</td>
</tr>
<tr>
<td>10/31/2018</td>
<td>70.3%</td>
</tr>
<tr>
<td>4/30/2019</td>
<td>74.3%</td>
</tr>
</tbody>
</table>

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**Graphs:**

- **Age Appropriate Benchmarks**
  - 5/1/2016: 87.2%
  - 10/31/2016: 78.5%
  - 4/28/2017: 73.3%
  - 10/31/2017: 80.6%
  - 4/30/2018: 84.7%
  - 10/31/2018: 49.5%
  - 4/30/2019: 67.6%
  - 10/31/2018: 70.3%
  - 4/30/2019: 74.3%

- **Two Year Old Immunization Rates**
  - 5/1/2016: 74.9%
  - 10/31/2016: 77.0%
  - 4/28/2017: 77.8%
  - 10/31/2017: 79.5%
  - 4/30/2018: 80.6%
  - 10/31/2018: 78.8%
  - 4/30/2019: 80.2%
A Strong Recommendation
What you say and how you say it matters

1. Assume parents will vaccinate
   - Parents not ready to vaccinate?

2. Give your strong recommendation
   - Parents accept your recommendation?
   - Parents have specific questions or concerns?

3. Listen to and respond to parent’s questions
   - Parents respond positively to your answers?

Administer recommended vaccine doses

Source: CDC Website
High Impact Strategies

Table 1. Temporal Distribution of All Vaccinations Administered

<table>
<thead>
<tr>
<th>Time of Vaccination</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional clinic hours</td>
<td>4,344,050</td>
<td>69.50</td>
</tr>
<tr>
<td>Off-clinic hours</td>
<td>1,906,352</td>
<td>30.50</td>
</tr>
</tbody>
</table>

- Participate in IQIP Visit! (Formerly AFIX)
- Schedule the next immunization visit before the patient leaves the office.
- Ensure appointments are kept – Provide reminders and reschedule missed appointments.
- Reminder / Recall – Notify patients when vaccines are due or past due. Schedule for appointment.
- Reduce barriers.

Goad et al., 2013. Vaccinations administered during off-clinic hours at a national community pharmacy: implications for increasing patient access and convenience. Annals of Family Medicine
Resources at Your Fingertips

Centers for Disease Control and Prevention
www.cdc.gov/vaccines

Immunization Action Coalition
www.immunize.org

The Vaccine Education Center
www.chop.edu/centers-programs/vaccine-education-center

Reliable Sources of Immunization Information handout
immunize.org website

Thank you!
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