Immunization Tips and Techniques

Allegheny County Immunization Coalition

7th Annual Immunization Conference

Amy Wishner, MSN, RN
Immunization Techniques are Key!

- The health of our patients - children, adolescents, and adults
- A safe and healthy community
- The financial health of our workplaces
Immunization – Skill and Art

- Knowledge
- Rapport with patient and family
- Effective communication
  - What are you giving?
  - What is it for?
- Provide comfort
- Work safely
- Document correctly
New Challenges

- Vaccines, schedules, shortages, recommendations
- Packaging – 2D barcoding
- Administration – intradermal
- Outbreak – new medication or recommendations
- Reporting vaccine-preventable diseases
- Storage and handling
- Immunization and emergency preparedness
We Still Need Vaccines!

- Diseases still common in U.S.
  - Varicella, pertussis, hepatitis B, influenza, pneumococcus

- Lower immunization rates would quickly cause many cases
  - Measles, mumps, Hib

- International travel – “just a plane ride away”
  - Polio, rubella, diphtheria, measles, mumps

- Can not be eliminated from environment - tetanus
Immunization Schedules

- New each year
  - 0-6 years
  - 7-18 years
  - Adolescent
  - Adult

- Catch-up schedules for those who fall behind
  - Minimum age for each dose
  - Minimum interval between each dose

Always use current schedules!
Medical Assistants and the Law in Pennsylvania

- No “Scope of Practice” regulations as there are for Registered Nurses and Licensed Practical Nurses in PA
- Medical Assistants work under the license of the physician (not the nurse)
- Immunizations must be ordered by the physician or designee (CRNP, P.A.)
- Competency must be assured by the physician
- Mistakes must be reported to the physician
Vaccine Orders

- Be sure you can read and understand orders
- Double check with doctor if order:
  - Is not clear
  - Does not match the immunization schedule
- Make sure order matches vaccine
- Make sure order matches patient
Document for Each Vaccination

- Date given
- Product: brand name, manufacturer, lot number, expiration date
- Route (IM, SC, intranasal, oral)
- Anatomical site where given
- Vaccine Information Statement: date given to patient and edition date
- Your name and title
- Clinic/practice name, address
Safety Syringes Used at Your Site?

- Federal Needlestick Safety and Prevention Act, passed in 2000
- If your employer will not comply, contact federal Occupational Safety and Health Administration (OSHA)
  - (800) 321- OSHA (6742)

Safe Needles Nurse and Employer Toolkits:
www.nursingworld.org/safeneedles
Vaccine Storage is Important! Do Not Give a Dud!

- All handlers of vaccine from manufacture to administration must maintain cold chain
- Vaccines and diluents in original boxes
  - Avoid mix-ups and protect from light

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**YOU MAY NEED A NEW REFRIGERATOR**

A new VFC vaccine storage equipment requirement took effect July 1, 2009. This new requirement will help ensure that VFC requested vaccines are properly stored and managed, preventing inadvertent administration of improperly stored vaccines to VFC eligible patients, wasted vaccines, and unnecessary vaccine management. In addition, it will also ensure that you have enough usable space to store the increased number of recommended vaccines.

All providers must comply with these requirements in order to receive VFC vaccines. The type of refrigerator or freezer you need is based on:

1. The number of vaccine doses your practice orders in a year. (Chart 1)
2. The maximum amount of vaccines you will store (see Table 2).
3. Required specifications (Chart 2).

**Did you know?**

An average provider stores tens of thousands of dollars worth of vaccines.

Not having the correct refrigerator or freezer may lead to costly vaccine losses or waste, substantially lowering your vaccine inventory.

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**REQUIRED SPECIFICATIONS**

- Refrigerator units must:
  - Maintain recommended vaccine storage temperatures (2°C - 8°C) unattended.
  - Be automatic defrost units, not self-defrost units.
  - Be located in an area away from windows or heat sources.
  - Have adequate space between units to prevent cross-contamination.
Freezer and Refrigerator Temperatures

- Storage units must maintain required temperature
- Use calibrated and certified thermometers
  - In each compartment near vaccines
- Freezer – dry ice can be too cold for MMR
  - MMR: -58 to 46°F (-50 to 8°C)
  - Varivax/Zostavax: 5°F (-15°C) or colder
- Refrigerator: 35-46°F (2-8°C)
  - Set for around 40°F (6°C) to give yourself some wiggle room (door opens frequently, short power outage)
Refrigerator and Freezer Temperatures

- VFC: all units need dual thermostat controls by 1/1/2013
- Document twice each day
- Keep logs on file for 3 years
- Temperature out of range? Take action!

Sample Temperature Log

<table>
<thead>
<tr>
<th>Temperature Log Form (°C)</th>
<th>Protect Your Vaccines: Check Both Temperatures Twice A Day!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month/Year</td>
<td>VFC Site</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Refrigerator</th>
<th>Temp High</th>
<th>Temp Low</th>
<th>Tag/Remarks</th>
</tr>
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<tbody>
<tr>
<td></td>
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</table>

Temperature out of range? Take action!
Power Failure – be prepared, have written plan, update yearly

- Assess problem
- Keep refrigerator and freezer doors shut
- If temperature is out of recommended range:
  - Contact VFC
  - Contact vaccine manufacturers, Dept. of Health
  - Consider transport and temporary storage
  - Measure temperature when problem is resolved
- Document what happened, actions taken
Vaccine Storage & Handling

- Separate VFC vaccines from private stock - label
- Notify VFC when VFC vaccine expires or is about to expire, spoils, or is wasted
- Use vaccines with shortest date first
- Inventory vaccines once per month
Vaccine Storage and Handling

- 45 providers in five highest-volume states
- 76% of providers stored vaccines at temperatures either too hot or too cold for at least five hours
- 13 providers stored expired vaccines with nonexpired vaccines
- No providers properly managed the vaccines according to VFC program requirements
Vaccine Storage and Handling

“Parents may want to start asking questions about the vaccines their children are getting because a government study uncovered some real problems with the way those often-necessary doses are stored.” June 6, 2012. http://www.myfoxtwincities.com/story/18723191/study-uncovers-vaccine-storage-problems#ixzz25KHrnxnR

“Providers of immunizations meant for low-income children don't store the vaccines at proper temperatures, potentially rendering them ineffective and placing children at risk for contracting serious diseases.” Good Morning, America. May 6, 2012
Vaccine Reactions

- Local reactions
  - Least severe, most frequent
  - Redness, swelling
  - Help prevent: IM injections in muscle, not SC

- Systemic reactions
  - Less frequent
  - Fever

- VIS includes guidance
  - What to expect
  - What is unusual and cause for concern
  - What to do
Syncope or Allergic Reactions -- rare, but be prepared

- **Prevent syncope (teens, young adults)**
  - Sit or lie down for immunization
  - Wait 15-20 minutes after immunization

- **Allergic reactions**
  - Have a written plan, practice drill
  - Keep CPR certification current
  - Know where epinephrine and equipment to maintain airway are kept
  - Call for MD and call 911

- **Document** – patient chart, VAERS, registry
Our Health

Do you have all your immunizations?

- Tdap
- Influenza
- Hepatitis A
- Hepatitis B
- Varicella
- MMR
Advocate for Mandatory Influenza Immunization - annual influenza vaccination as a condition of employment

- Patient's well-being comes ahead of personal preferences of healthcare workers
- Supported by AAP, AAFP, APhA, AHA
- Join the IAC’s “Honor Roll”
  http://www.immunize.org/honor-roll/
Vaccine Safety

- Parents may have questions

What can we do?

- Provide reassurance - our practice follows all recommendations
- Educate - vaccines prevent serious diseases that are still around
- Use VIS
- Bring in physician
- Document if patient refuses vaccines
Vaccine Safety – the facts

- Vaccines do not cause autism
- Thimerosal does not cause autism
- Babies do not get too many vaccines
- No reason to spread out the vaccines over time
Vaccine Safety – 1802
“The Cow Pock — or — the Wonderful Effects of the New Inoculation”
Patient and Family Education Resources

- Vaccine Education Center
  www.vaccine.chop.edu

- Recommended web sites:
  - www.cdc.gov/vaccines (CDC)
  - www.immunize.org (Immunization Action Coalition)
  - www.aap.org/immunization/ (AAP)
  - www.ecbt.org and www.vaccinateyourbaby.org (Every Child by Two)
  - www.PKIDS.org and www.GetVaxed.org (Parents of Kids with Infectious Diseases)

- Document patient refusal
Vaccine Safety – the facts

- Not immunizing is a big risk – baby or older person can get sick and even die from vaccine-preventable diseases
- Vaccines are a great way to help your child and family stay healthy!
What do you do when a patient comes with no immunization records?

Premature infant – what immunization schedule do you follow?
- Is a cold with low fever a contraindication to immunization?
- Is an immunocompromised person in the household a contraindication to immunization?
- Can the flu vaccine give you the flu?
Vaccine Administration
Make sure you have:

- Clear orders
- Right patient
- Right vaccine and diluent
- Right dose
- Right route
- Right site
- Right needle size
Right Patient

- Have patient identify self/child to you – 2 identifiers
  - “What is your child’s name and date of birth?”
  - Adult patient: “What is your name and date of birth?”
  - Immunization records/registry - Have you/your child received vaccinations under any other name?

- Do not ask, “Are you Mrs. Jones and is this Sharon?”
Needle Length

- Needle used is too short? (IM injection goes into fat instead of muscle)
  - Impaired immune response
  - Increase in local reactions (redness, pain, swelling)

- Needle used is too long? Hit the bone

- Assess patient
Intramuscular Injections

- DTaP, Tdap, Hib, hepatitis A and B, influenza, PCV, PPSV (IM or SC), Menactra, Menveo, IPV (IM or SC)
- Insert at 90 degree angle
- Needle length - assess patient
Intramuscular Injections - children

- Up to 1 month old: 5/8 inch needle – thigh
- 1 month until 1 year: 1 inch needle – thigh
- 1 through 18 years:
  - Deltoid (arm): 5/8” (no bunching) or 1 inch needle
  - Thigh: 1 to 1 ¼ inch needle

*Vastus lateralis* muscle - thigh

Deltoid muscle - arm
Intramuscular Injections – adults
deltoid muscle (arm)

- 1 inch needle for most until around 150 lbs. (70 kg.) – then consider 1 ½ inch needle
- Weigh less than 130 lbs. (60 kg.)? Some recommend 5/8 inch needle
Subcutaneous Injections

- MMR, varicella, MMRV, Menomune, IPV (IM or SC), PPSV (IM or SC)
- Insert at 45 degree angle
- All ages: 5/8 inch long needle
Subcutaneous Injections

- Infants younger than 12 months: thigh
- People 1 year and older: upper-outer triceps (arm)
Oral – rotavirus – squirt next to cheek

Intranasal – LAIV (FluMist) – squeeze firmly to make mist
Intradermal Injection – Fluzone Intradermal

- Insert needle perpendicular to the skin, in region of the deltoid – NOT where you do TB test
- Do not aspirate
Avoid Immunizations Back Here!

- Thin muscle in children
- Close to sciatic nerve
- Challenging to correctly identify site
- Hepatitis B or rabies vaccine given in gluteal site – not valid, repeat dose
Use aseptic technique

- Keep patients as free as possible from undesirable microorganisms
- Prevent contamination
- Only sterile objects touch the skin where it will be broken and a needle will enter
- Handwashing – thorough and frequent

Be aware of what your hands touch (eyes, nose, hair)
Check Expiration Dates – vaccine and diluent

- Month/day/year – through end of day indicated
- Month/year – through last day of the month indicated
- Expired dose of live virus vaccine given?
- Expired dose of vaccine that is not a live virus given?
- Over expiration date by one day? EXPIRED!
Manufacturer-supplied prefilled syringes

- Sterile seal is broken when you add needle
- Discard at end of clinic day, even if unused

Do not prefill your own syringes

- Quality control
- Patient safety
- Easy to make administration errors, waste vaccine
- FDA does not license administration syringes for vaccine storage - bacterial contamination and growth, loss of potency
# Drawing Up Vaccines

- Only give vaccines that YOU have prepared

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Time allowed between reconstitution and use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varicella-containing vaccines</td>
<td>30 minutes</td>
</tr>
<tr>
<td>MMR</td>
<td>8 hours</td>
</tr>
<tr>
<td>Pentacel</td>
<td>30 minutes</td>
</tr>
</tbody>
</table>
Drawing up vaccine ahead of time at mass immunization clinic

- *Only if one type of vaccine*, such as influenza
- Draw up only at clinic site
- May pre-draw up 1 multidose vial or 10 doses
- Store at appropriate vaccine temperature
- Avoid delay in administration of vaccine
- Discard remaining pre-drawn vaccine in syringes at end of vaccination session
- Before injecting, you can recap needle – do not scoop up cap
- Space injections at least 1 inch apart
- No need to aspirate
Reconstituting Vaccines

- Dry vaccine mixed with diluent - MMR, Varicella, Hib
- Dry vaccine mixed with liquid vaccine - Pentacel, Menveo
- No need to change the needle unless it is contaminated or bent
Right Vaccine and Diluent

- Check physician’s order - question if not clear
- Check vaccine and diluent 3 times
  - Use only diluent supplied with that vaccine
  - Do not mix vaccines unless supplied by manufacturer for that purpose – No home brews!
- Label each vaccine after drawing up
- Check again just before giving to patient
Vaccines and Diluents

- ActHIB + 0.4% sodium chloride
- Hiberix + 0.9% sodium chloride
- Rotarix + sterile water/calcium carbonate/xanthan
- MMR + sterile water
- Varivax + sterile water
- ProQuad (MMRV) + sterile water
- Zostavax + sterile water
- Menomune + sterile water
Mistakes can Happen

- What should you do if you used the **wrong diluent** with a vaccine?
- What should you do if you gave MMR vaccine IM instead of SC? *(wrong route)*
Right Dose

- Doses are age-based, not weight-based
  - Injectable flu: 6-35 months – 0.25 mL
  - Hepatitis A: 12 months through 18 years: 0.5 mL
  - Hepatitis B: birth through 19 years: 0.5 mL

- Check orders
- Get full dose into patient: tighten needle, safely position patient
- Full dose not given? Repeat immediately EXCEPT for LAIV or rotavirus vaccines
# Common Mix-Up: DTaP and Tdap

<table>
<thead>
<tr>
<th>Error</th>
<th>Action</th>
</tr>
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<tbody>
<tr>
<td>DTaP given to person ≥ 7 yrs.</td>
<td>Count dose as valid</td>
</tr>
<tr>
<td>Tdap given to child &lt; 7 yrs. as DTaP dose #1, 2, or 3</td>
<td>Do NOT count the dose as valid; Give DTaP now</td>
</tr>
<tr>
<td>Tdap given to child &lt; 7 yrs. as DTaP dose #4 or #5</td>
<td>Count dose as valid</td>
</tr>
</tbody>
</table>

- **Post immunization schedules**
- **Clearly label vaccines and diluents**
Impact of Vaccine Errors – rarely cause serious reaction, but...

- Extra dose may lead to more severe local reaction
- Patient may be left unprotected
- Additional cost for another dose if needed, extra cost for original dose (Zostavax/Varivax)
- Inconvenience for patient, parent
- Dissatisfied parent, may have less confidence in provider
Give Least Painful Vaccines First

- Reduces overall pain from multiple injections
- Babies: “drink first” – give oral rotavirus vaccine first
- Children:
  - Give Prevnar as last thigh injection
  - Give MMR and varicella vaccines last in arms (or thighs)
- Teens: give HPV last
Positioning – maintain control of limb being injected
Proper Disposal

- Do not recap needle after injection
- Activate safety mechanism
- Immediately discard used needle in sharps container
- Replace container when ¾ full
Antipyretics and Vaccination

- CDC and AAP stopped recommending antipyretics BEFORE or AT THE TIME OF vaccination
- Antipyretics can be used for pain or fever following vaccination
- Antipyretics not shown to prevent febrile seizures in children with previous febrile seizures
Standing Orders Protocols for Immunization

- Which patients may safely be immunized for each specific vaccines
- Dosage if differs by age
- Detail patient assessment, contraindications
- What to do if adverse event
- Documentation
- Communication with the medical home
- Anyone can develop, signed by physician

See [www.immunize.org](http://www.immunize.org) for templates
2D Barcoding – vial, unit dose syringe

- Product information, lot/batch number, expiration date
- Does not include site/route, who administers vaccine
- Improve patient safety
- Increase practice efficiency – recording information, billing, inventory
- Helps separate VFC and private vaccines
- CDC adding 2D barcodes to VISs
Resources on how Vaccine Bar Codes Work and Help Practices

- http://www.youtube.com/watch?v=1nbRpPSb3o&feature=plcp
- http://www.youtube.com/watch?v=83JR3kQa7QU&feature=context-cha
Joining SIIS - bidirectional, real time interface

- New patient?
  - No need to wait for previous records
  - Select from SIIS and import into patient chart (no transcribing)

- Send new vaccine info into SIIS (no transcribing)

- Right information in front of right user at right time

- [http://www.youtube.com/watch?v=PU7h83lqaCo&feature=context-cha](http://www.youtube.com/watch?v=PU7h83lqaCo&feature=context-cha)
Reporting Vaccine-Preventable Diseases

- Embed in EHR
  - Symptoms cluster (phone, visit), lab result trigger to clinician
    - This looks like X – do you want to make a Report?
  - Direct reporting to Department of Health
  - Populate reporting form (no transcribing)

- Currently in trials
Emergency Preparedness

- Teach vaccine administration, storage, handling, vaccine safety system to emergency preparedness volunteers
- Health Alert Network (HAN) – PA, county
- Develop your network: public health, school nurses, school physicians, emergency preparedness, pediatric and family medicine practices, PA AAP, PAFP
Vaccine Training Resources

- [www.eziz.org](http://www.eziz.org) and [www.cdph.ca.gov/programs/immunize/Pages/VaccineStorageandHandling.aspx](http://www.cdph.ca.gov/programs/immunize/Pages/VaccineStorageandHandling.aspx)
  California Department of Public Health – Immunization Branch

- [http://www.nip-it.org/](http://www.nip-it.org/)
  Nursing Initiative Promoting Immunization Training – University of Oklahoma College of Nursing and CDC

- [http://www.cdc.gov/vaccines/hcp.htm](http://www.cdc.gov/vaccines/hcp.htm)
  CDC

- [http://www2.aap.org/immunization/pediatrists/trainingguide.html](http://www2.aap.org/immunization/pediatrists/trainingguide.html)
  American Academy of Pediatrics practice toolkit
http://www.cdc.gov/injectionsafety/
Thank you, fellow Immunization Champions

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