


## Make No Mistake: Vaccine Storage/Handling & Administration


Andrew Kroger M.D., M.P.H.  
National Center for Immunization and Respiratory Diseases  
Centers for Disease Control and Prevention

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## Cold Chain (a temperature-controlled supply chain)


- ❑ Vaccines must be stored properly from the time they are manufactured until they are administered
- ❑ Shared responsibility among manufacturers, distributors, public health staff, and health care providers
- ❑ Provider cold chain management
  - Trained personnel
  - Appropriate equipment
  - Efficient vaccine management



[www.cdc.gov/vaccines/recs/vac-admin/providers-role-vacc-admin-storage.htm](http://www.cdc.gov/vaccines/recs/vac-admin/providers-role-vacc-admin-storage.htm)

## Vaccine Storage and Handling Plans

- ❑ Develop and update plans annually
  - Routine Plan
  - Emergency Plan
- ❑ Keep plans near storage unit(s)
  - Ensure staff know where to find plans and are familiar with them
  - Ensure custodial /security staff are familiar with emergency notification procedures




## Staff Training and Education

- ❑ Assign responsibilities to a primary vaccine coordinator
- ❑ Designate at least one alternate (back-up) vaccine coordinator
- ❑ A physician partner or member of management should be directly involved with responsible clinical staff

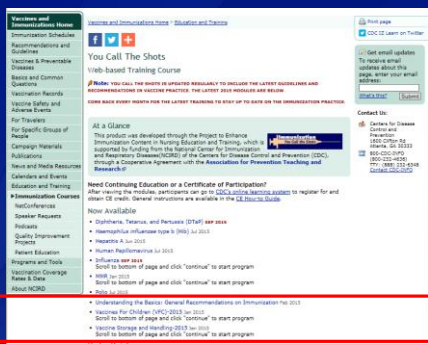


## Training and Education

- ❑ Staff who:
  - Handle or administer vaccines
  - Deliver or accept vaccine shipments
  - Have access to vaccine storage unit(s)
- ❑ Provide training and education when:
  - New or temporary staff are oriented
  - New vaccines are stocked
  - Changes to storage and handling guidelines occur



## CDC Training Resources



[www.cdc.gov/vaccines/ed/youcalltheshots.htm](http://www.cdc.gov/vaccines/ed/youcalltheshots.htm)





## Vaccine and Diluent Placement

- Store vaccines away from walls, coils, cooling vents, top shelf, ceiling, door, floor, and back of unit
- Keep vaccines and diluents in original packaging with lids to protect from light
- Stack in rows with same type of vaccine and diluent
- Use uncovered storage containers to organize vaccines and diluents
- Do not store in doors, on top shelf, on floor, or in deli, vegetable or fruit crisper drawers

## Vaccine and Diluent Labeling

- Use labels with vaccine type, age, and gender indications or color coding
- Do not store sound-alike and look-alike vaccines next to each other
- Identify and store VFC vaccines and other vaccines purchased with public funds separately from vaccines purchased with private funds



[www.cdc.gov/vaccines/recs/storage/guide/vaccine-storage-labels.pdf](http://www.cdc.gov/vaccines/recs/storage/guide/vaccine-storage-labels.pdf)

## Diluent Storage

- Store diluent as directed in manufacturer's package insert
- Store refrigerated diluent with corresponding vaccine (these diluents may contain vaccine antigen)
- Never store diluents in the freezer
- Label diluent to avoid inadvertent use of the wrong diluent when reconstituting a vaccine

**Diluents with Diluents How to Use Them**

Refer to the vaccine manufacturer's package insert for specific storage and handling instructions. Do not use diluents that are expired, damaged, or otherwise compromised. Do not use diluents that are not specifically labeled for use with the vaccine.

Diluent product name	Manufacturer	Intended vaccine product	Intended use (see package insert)	Storage conditions (see package insert)	Storage location
Adjuvanted Diluent	Novartis	Adjuvanted vaccines	For use with adjuvanted vaccines	2-8°C (36-46°F)	Refrigerator
Non-Adjuvanted Diluent	Novartis	Non-adjuvanted vaccines	For use with non-adjuvanted vaccines	2-8°C (36-46°F)	Refrigerator
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[www.immunize.org/catg.d/p3040.pdf](http://www.immunize.org/catg.d/p3040.pdf)

## Vaccine S&H Best Practices

- Store food and beverages in separate refrigerator and freezer than where vaccines are stored
- NEVER store vaccines and other medications or biologics in same tray or container or bin. If possible, store products other than vaccines in different unit



Do NOT store food or beverages inside a vaccine refrigerator or freezer.



If other medications/biologics are stored in same unit with vaccines, store on a lower shelf.

## Preventive Measures

- Plug only one unit in an outlet
- Use plug guard or safety lock plug
- Label circuit breakers and electrical outlets
- Post warning signs that include emergency contact information



## Expiration Dates

- At least 1 time each week and each time vaccines are delivered, check and arrange vaccines and diluents in storage unit according to expiration dates



Vaccine may be used up to and including the expiration date.

## Exceptions to Expiration Dates

### ❑ Multidose vials (MDVs)

- Most MDVs may be used until the expiration date on the vial unless contaminated or compromised in some way. Some MDVs have a specified timeframe for use once the vial is entered

#### 2.2 Administration Instructions

Shake well before administration. Parenteral drug products should be inspected visually for particulate matter and discoloration prior to administration, whenever solution and container permit. If either of these conditions exists, the vaccine should not be administered.

Attach a sterile needle to the prefilled syringe and administer intramuscularly.

For the multi-dose vial, use a sterile needle and sterile syringe to withdraw the 0.5-mL dose from the multi-dose vial and administer intramuscularly. A sterile syringe with a needle bore no larger than 23 gauge is recommended for administration. It is recommended that small syringes (0.5 mL or 1 mL) be used to minimize any product loss. Use a separate sterile needle and syringe for each dose withdrawn from the multi-dose vial.

Between uses, return the multi-dose vial to the recommended storage conditions, between 2° and 8°C (36° and 46°F). Do not freeze. Discard if the vaccine has been frozen. Once entered, a multi-dose vial, and any residual contents, should be discarded after 28 days.

## Exceptions to Expiration Dates

### ❑ Manufacturer shortened expiration date

- If vaccine has been exposed to inappropriate storage conditions, potency may be reduced before the expiration date. The manufacturer may shorten the expiration date

## Vaccine Transport

### ❑ If vaccines must be transported to an off-site/satellite facility, here are the "Do's" and Don'ts"

- DO
  - Limit amount of vaccines to what is needed for that workday
  - Limit total transport and workday time to 8 hours
  - Transport in portable refrigerator or qualified container and pack out (either can be purchased commercially). If this is not feasible, use hard sided cooler with basic pack out design and supplies

## Vaccine Transport

### ❑ If vaccines must be transported to the facility, here are the "Do's" and Don'ts"

- DO
  - Record temperature inside packed container along with date, time, and your initials on temperature log at beginning of transport, upon arrival at facility, and when any remaining vaccines are returned to primary storage facility
  - Immediately transfer vaccines to refrigerator that maintains recommended temperature range upon arrival at facility and record refrigerator temperature, time, and initials
  - Temperature should be recorded at least twice during workday

## Vaccine Transport

### ❑ Basic pack out design (listed from bottom to top inside container)

- Conditioned frozen water bottles (Ice should spin freely in the water)
- Corrugated cardboard (cut to fit interior dimensions of cooler)
- Bubble wrap (at least 1 inch thick to cover cardboard)
- Vaccines (in original packaging)
- Temperature monitoring device (preferably DDL buffered probe)
- Bubble wrap (at least 1 inch thick to cover cardboard)
- Corrugated cardboard (cut to fit interior dimensions of cooler)
- Conditioned frozen water bottles (Ice should spin freely in the water)

## Vaccine Transport

### ❑ If vaccines must be transported to the facility, here are the "Do's" and Don'ts"

- DON'T
  - Reuse manufacturer shipping containers and supplies
  - Use frozen gel packs, ice, or dry ice
  - Freeze vaccines or diluents
  - Transport in a vehicle trunk

**NOTE: Use of frozen water bottles or ice packs that are not conditioned properly can freeze your vaccine shipment.**



## VACCINE ADMINISTRATION

### Patient Care Before Administering Vaccines

- ❑ **Obtain complete immunization history at every health care visit**
  - Accept only written, dated records (exception influenza and PPSV23 self-report)
  - Use recommended schedule to determine vaccines needed based on age, medical condition, and risk factors
- ❑ **Screen for contraindications and precautions prior to administering any vaccine(s)**
- ❑ **Discuss vaccine benefits and risks and vaccine-preventable disease risks using VISs and other reliable resources**
- ❑ **Provide after-care instructions**

[www.immunize.org/catg.d/p4060.pdf](http://www.immunize.org/catg.d/p4060.pdf)  
[www.immunize.org/catg.d/p4063.pdf](http://www.immunize.org/catg.d/p4063.pdf)  
<http://publichealth.ny.gov/pr/immunization/parents/comfort-bethereE.pdf>

### Vaccine Administration Best Practices

- ❑ **Maintain proper infection control practices while preparing and administering vaccines.**
  - Always use aseptic technique.
- ❑ **Use proper hand hygiene techniques before preparing vaccines.**
- ❑ **Prepare vaccines in a clean, designated medication area not adjacent to any area where potentially contaminated items are placed.**
- ❑ **Prepare vaccines just prior to administration.**

### Infection Control

- ❑ **Hand hygiene should be performed**
  - Before vaccine preparation
  - Between patients
  - Any time hands become soiled
- ❑ **Gloves are not required when administering vaccines unless the person administering the vaccine is likely to come into contact with potentially infectious body fluids or has open lesions on hands**
  - If gloves are worn, they should be changed
  - Hand hygiene performed between patients

### Vaccine Preparation

- ❑ **Use a separate 1-mL or 3-mL sterile syringe for each injection**
- ❑ **Select a separate sterile needle for each injection based on route, size of individual, and injection technique**
- ❑ **Inspect vaccine and diluent vials for damage or contamination**
- ❑ **Check the expiration dates on the syringe, needle, vaccine, and diluent**
- ❑ **Use only the manufacturer supplied diluent to reconstitute a vaccine**

### Provider Predrawn Syringes

- ❑ **Predrawing vaccine is not recommended:**
  - Increases risk for administration errors.
  - May lead to vaccine waste.
  - Can cause bacterial growth in vaccines that do not contain a preservative.
  - Administration syringes are not designed for storage.
- ❑ **Consider using manufacturer-filled syringes for large immunization events because they are designed for both storage and administration.**

## Vaccine Preparation

- Once a manufacturer-filled syringe is activated (i.e., syringe cap removed or needle attached), vaccine should be used or discarded at end of workday



## Vaccine Preparation

- Only open a single-dose vial when ready to use. Once protective cap is removed, vaccine should be used. If not used, it should be discarded at end of workday



## Vaccine Preparation "Nevers"

- Never combine vaccines into a single syringe except when specifically approved by the FDA and packaged for that specific purpose
- Never transfer vaccine from one syringe to another
- Never draw partial doses of vaccine from separate vials to obtain a full dose

## Provider Predrawn Syringes

- At clinic site, no more than 1 multidose vial or 10 doses should be drawn up at one time by each vaccinator.
- If more than one vaccine type is being administered, set up separate administration stations for each vaccine type to prevent medication errors.
- Patient flow should be monitored to avoid drawing up unnecessary doses.
- At end of workday, any remaining vaccine in provider predrawn syringes should be discarded.

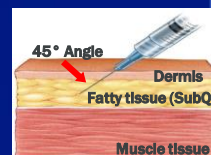
## Route and Site

- Oral (PO)**
  - Administer liquid slowly down one side of the inside cheek (between the cheek and gum) toward the back of infant's mouth
- Nasal (NAS)**
  - LAIV is the only vaccine administered by the intranasal route
  - Insert the tip of the sprayer and spray half the dose in one nostril then remove the dose divider clip and administer the other half-dose in the other nostril



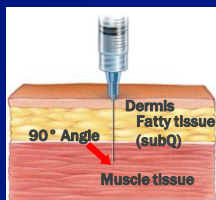
## Subcutaneous (subcut) Route

- Site**
  - Thigh for infants younger than 12 months of age
  - Upper outer triceps of arm for children older than 12 months and adults (can be used for infants if necessary)
- Needle gauge and length**
  - 23- to 25-gauge needle, 5/8- inch
- Technique**
  - To avoid reaching the muscle, pinch up the fatty tissue, insert the needle at a 45° angle and inject the vaccine into the tissue



### Intramuscular (IM) Route

- Spread the skin of the site taut between the thumb and forefinger, isolating the muscle
- Another technique, acceptable mostly for pediatric and geriatric patients, is to grasp the tissue and “bunch up” the muscle
- Insert the needle fully into the muscle at a 90° angle and inject



Aspiration is **NOT** required

### Intramuscular (IM) Route Infants 12 Months and Younger

- **Site**
  - Vastus lateralis muscle (anterolateral thigh)
- **Needle gauge and length**
  - 22- to 25-gauge
  - Neonates and preterm infants: 5/8-inch 5/8-inch needle is adequate if the skin is stretched flat between thumb and forefinger
  - 1 month and older: 1-inch



### Intramuscular (IM) Route 1 Year through 2 Years

- **Site**
  - Vastus lateralis muscle (anterolateral thigh) is preferred
  - Deltoid muscle (upper arm) may be used if the muscle mass is adequate
- **Needle gauge and length**
  - 22- to 25-gauge
  - 5/8 to 1-inch 5/8-inch needle is adequate only for the deltoid muscle and only if the skin is stretched flat between thumb and forefinger



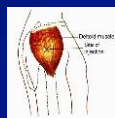
### Intramuscular (IM) Route 3 Years of Age and Older

- **Site**
  - Deltoid muscle (upper arm) is preferred
  - Vastus lateralis muscle (anterolateral thigh) may be used
- **Needle gauge and length**
  - 22- to 25- gauge
  - 5/8 to 1-inch
- **Most young children in this age range require a 5/8 or 1-inch needle**
  - 5/8-inch needle is adequate only for the deltoid muscle and only if the skin is stretched flat between thumb and forefinger for children 3-18
- **Older children and adolescents require a 1-inch needle**



### Intramuscular (IM) Route Adults 19 Years and Older

- **Site**
  - Deltoid muscle (upper arm) is preferred
  - Vastus lateralis muscle (anterolateral thigh) may be used
- **Needle gauge: 22- to 25-gauge**
- **Needle length varies related to size of patient**



### Common Errors

Too High

Buttock

Too Low



## Common S&H and Administration Errors

- ❑ Administering expired vaccine or diluent
- ❑ Leaving storage unit door ajar
- ❑ Using the wrong diluent
- ❑ Failing to take immediate action when a temperature excursion occurs
- ❑ Administering by an incorrect route
- ❑ Violating intervals
- ❑ Failing to use an age-appropriate vaccine formulation

## Storage and Handling and Vaccine Administration Resources

- ❑ **CDC's Vaccine Storage and Handling web page**  
[www.cdc.gov/vaccines/recs/storage/default.htm](http://www.cdc.gov/vaccines/recs/storage/default.htm)
- ❑ **CDC's Vaccine Administration web page**  
[www.cdc.gov/vaccines/recs/vac-admin/default.htm](http://www.cdc.gov/vaccines/recs/vac-admin/default.htm)
- ❑ **CDC's Injection Safety web page**  
[www.cdc.gov/injectionsafety/](http://www.cdc.gov/injectionsafety/)
- ❑ **Immunization Action Coalition Storage and Handling web page**  
[www.immunize.org/handouts/vaccine-storage-handling.asp](http://www.immunize.org/handouts/vaccine-storage-handling.asp)
- ❑ **Immunization Action Coalition Vaccine Administration web page**  
[www.immunize.org/handouts/administering-vaccines.asp](http://www.immunize.org/handouts/administering-vaccines.asp)
- ❑ **Also check Awardee Immunization Program websites**  
[www.cdc.gov/vaccines/imz-managers/awardee-imz-websites.html](http://www.cdc.gov/vaccines/imz-managers/awardee-imz-websites.html)