Don't Be Guilty of These Errors in Vaccine Storage and Handling

The following are frequently reported errors in vaccine storage and handling. Some of these errors are much more serious than others, but none of them should occur. Be sure your clinic or practice is not making errors such as these.

Error #1: Designating only one person, rather than at least two, to be responsible for storage and handling of vaccines

Since vaccines are both expensive and fragile, everyone in the office should know the basics of vaccine handling, including what to do when a shipment arrives and what to do in the event of an equipment failure or power outage. It's very important to train at least one back-up person in all aspects of proper storage and handling of vaccines. The back-up and primary persons should be equally familiar with all aspects of vaccine storage and handling, including knowing how to handle vaccines when they arrive, how to properly record refrigerator and freezer temperatures, and should be prepared to lead the response to an equipment problem or power outage.

Error #2: Refrigerating vaccine in a manner that could jeopardize its quality

The temperature in the vegetable bins, on the floor, next to the walls, in the door, and near the cold air outlet from the freezer may differ significantly from the temperature in the body of the refrigerator: do not store your vaccines or place thermometers in these locations. Always store vaccines in their original packaging in the body of the refrigerator away from these locations, and place your thermometer with the vaccines. Place vaccine packages in such a way that air can circulate around the compartment. Never overpack a refrigerator compartment.

Error #3: Storing food and drinks in the vaccine refrigerator

Frequent opening of the refrigerator door to retrieve food items can adversely affect the internal temperature of the unit and damage vaccines.

Error #4: Inadvertently leaving the refrigerator or freezer door open or having inadequate seals

Remind staff to close the unit doors tightly each time they open them. Also, check the seals on the doors on a regular schedule, and if there is any indication the door seal may be cracked or not sealing properly, have it replaced. Replacing a seal is much less costly than replacing a box of pneumococcal conjugate or varicella vaccine.

Error #5: Storing vaccine in a dorm-style refrigerator

All vaccines should be stored in a refrigerator and/or freezer unit that is designed specifically for the storage of biologics or, alternatively, in a separate free-standing unit. A dorm-style combination refrigerator-freezer unit with just one exterior door has been shown to be unacceptable no matter where the vaccine was placed inside the unit. Small stand-alone refrigerator or freezer units are best for short-term storage needs.

Error #6: Recording temperatures only once per day

Temperatures fluctuate throughout the day. Temperatures in the refrigertor and freezer should be checked at the beginning and end of the day to determine if the unit is getting too cold or too warm. Ideally, you should have continuous thermometers that record temperatures all day and all night; those with alarms can alert you when temperatures go out of range. A less expensive alternative is to purchase maximum/minimum thermometers. Only thermometers with a Current Certificate of Traceability and Calibration* should be used for vaccine storage. It's also a good idea to record the room temperature on your temperature log in case there is a problem with the storage unit. This information may be helpful to the vaccine manufacturer and/or state immunization program in determining whether your vaccine is still usable.

Error #7: Recording temperatures for only the refrigerator or freezer, rather than both

It is essential to monitor and record temperatures in all refrigerators and freezers used to store vaccine. At all times you should have calibrated thermometers in the refrigerators as well as the freezers. Assure that your storage temperature monitoring is accurate by purchasing thermometers that have a Certificate of Traceability and Calibration* and recalibrate them according to the manufacturer's instructions. Your state immunization program may be able to provide more information on calibrated thermometers.

Error #8: Documenting out-of-range temperatures on vaccine temperature logs but not taking action

Documenting temperatures is not enough. Acting on the information is essential! So, what should you do? Notify your supervisor whenever you have an out-of-range temperature. Sometimes the solution is as simple as shutting a door left ajar or re-checking a freezer temperature that is slightly elevated as it goes through a normal, brief defrost cycle. Check the condition of the unit for problems. Are the seals on the door tight? Is there excessive lint or dust on the coils? After you have made any adjustment, document the date, time, temperature, the nature of the problem, the action you took, and the results of your action. Recheck the temperature every two hours. Call maintenance or a repair person if the temperature is still out of range. If the solution is not quick and easy, you will need to safeguard your vaccines by moving them to another storage unit that is functioning at the proper temperature. Label the affected vaccines "Do not use" and contact your state immunization program or vaccine manufacturer to find out if the affected vaccine is still usable. Be sure to notify your state's VFC Program Coordinator if VFC vaccine was involved.

Error #9: Discarding temperature logs at the end of every month

It's important that you keep your temperature logs for at least three years. As your refrigerator or freezer ages, you can track recurring problems. If out-of-range temperatures have been documented, you can determine how long and how often this has been happening and take appropriate action. It's also a great way to demonstrate why you need a new refrigerator or freezer.

Error #10: Discarding multi-dose vials 30 days after they are opened

Don't discard your multi-dose vials of vaccines prematurely. Almost all multi-dose vaccine vials contain a preservative and can be used until the expiration date on the vial unless there is actual contamination or the vials are not stored under appropriate temperatures. However, you must discard multi-dose vials of reconstituted vaccine (e.g., meningococcal polysaccharide, yellow fever) if they are not used within a defined period after reconstitution. Refer to the vaccine package inserts for detailed information.

Error #11: Not having emergency plans for a power outage or natural disaster

Every clinic should have a written Emergency Response Plan that identifies a refrigerator and freezer in another location (ideally, a storage unit with a back-up generator) in which to store vaccine in the event of a power outage or natural disaster. Consider arranging in advance for a local hospital or similar facility to be your back-up location if you should need it. Be sure back-up location staff understand vaccine storage and will allow you to supervise placement and verify storage temperatures so vaccine is not damaged.

*A calibrated thermometer with a Certificate of Traceability and Calibration with calibration measurements traceable to a testing laboratory accredited by the International Organization of Standardization, to the Standards of the National Institute of Standards and Technology, or to another internationally recognized standards agency.

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www.immunize.org/catg.d/p3036.pdf • Item #P3036 (4/11)

Vaccine Storage Temperatures

☑ Store unopened and opened vaccines in their original box with the lid in place until administration. Many vaccines should be protected from light.

☑ Keep calibrated thermometers with *Certificates of Traceability and Calibration* in both the refrigerator and freezer. Read and document refrigerator and freezer temperatures in the morning *AND* at the end of the work day.

☑ Have a current emergency vaccine retrieval and storage plan. Exposure of a vaccine to temperatures outside the recommended range requires immediate corrective action. Contact the vaccine manufacturer and/or your state or local health department for guidance.

Vaccine(s)	Diluent – Store Between:	Vaccine – Store Between:
DTaP, DT, Tdap, Td	No diluent	35°F & 46°F (2°C & 8°C)
Hepatitis A	No diluent	
Hepatitis B	No diluent	
Hib (ActHIB, Hiberix)	35°F & 46°F (2°C & 8°C)	
Hib (PedvaxHIB)	No diluent	
HPV	No diluent	
Influenza (LAIV)	No diluent	
Influenza (TIV)	No diluent	
Meningococcal (MCV4 – Menactra)	No diluent	
Meningococcal (MCV4 – Menveo)	35°F & 46°F (2°C & 8°C)	
Meningococcal (MPSV4)	35°F & 46°F (2°C & 8°C)	
Pneumococcal (PCV, PPSV)	No diluent	
Polio (IPV)	No diluent	
Rotavirus (RV-5 RotaTeq)	No diluent	
Rotavirus (RV-1 Rotarix)	68°F & 77°F (20°C & 25°C)	
MMR	35°F & 46°F (2°C & 8°C)	-58°F & 46°F (-50°C & 8°C)*
Varicella	35°F & 77°F (2°C & 25°C)	-58°F & 5°F (-50°C & -25°C)
Zoster	35°F & 77°F (2°C & -25°C)	-58°F & 5°F (-50°C & -25°C)
Combination Vaccines		
DTaP-IPV (Kinrix)	No diluent	35°F & 46°F (2°C & 8°C)
DTaP-HepB-IPV (Pediarix)	No diluent	
DTaP-IPV/Hib (Pentacel)	35°F & 46°F (2°C & 8°C)	
HepA-HepB (Twinrix)	No diluent	
Hib-HepB (Comvax)	No diluent	
MMRV	35°F & 46°F (2°C & 8°C)	-58°F & 5°F (-50°C & -25°C)

*MMR may be stored in either refrigerator or freezer.

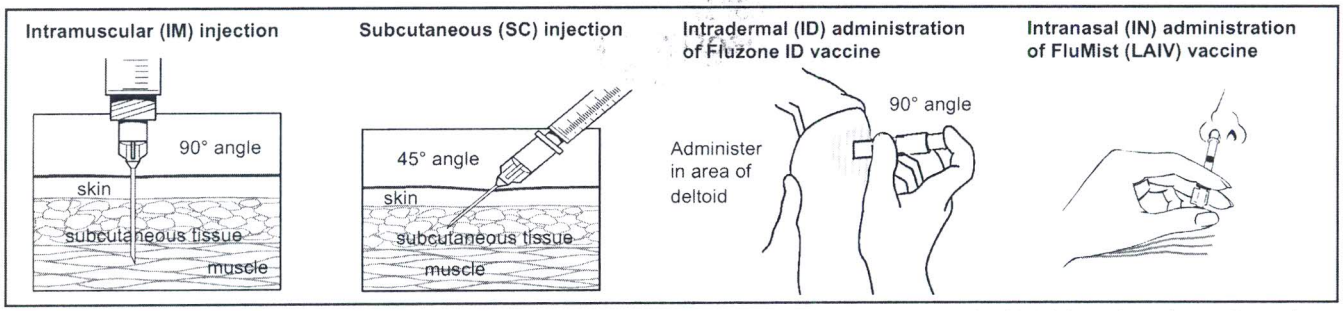
For more information, see CDC's **Vaccine Storage & Handling Guide** (http://www.cdc.gov/vaccines/recs/storage/guide/vaccine-storage-handling.pdf)

Administering Vaccines to Adults: Dose, Route, Site, and Needle Size

Vaccine	Dose	Route
Hepatitis A (HepA)	≤18 yrs: 0.5 mL	IM
	≥19 yrs: 1.0 mL	
Hepatitis B HepB)	≤19 yrs: 0.5 mL	IM
	≥20 yrs: 1.0 mL	
HepA-HepB (Twinrix)	≥18 yrs: 1.0 mL	IM
Human papillomavirus (HPV)	0.5 mL	IM
Influenza, live attenuated (LAIV)	0.2 mL (0.1 mL into each nostril)	Intranasal spray
Influenza, trivalent inactivated (TIV), including Fluzone High-Dose	0.5 mL	IM
Influenza (TIV) Fluzone Intradermal, for ages 18 through 64 years	0.1 mL	Intradermal
Measles, Mumps, Rubella (MMR)	0.5 mL	SC
Meningococcal, conjugate (MCV4)	0.5 mL	IM
Meningococcal, polysaccharide (MPSV4)	0.5 mL	SC
Pneumococcal, conjugate (PCV13)	0.5 mL	IM
Pneumococcal, polysaccharide (PPSV)	0.5 mL	IM
		SC
Tetanus, Diphtheria (Td) with Pertussis (Tdap)	0.5 mL	IM
Varicella (VAR)	0.5 mL	SC
Zoster (Zos)	0.65 mL	SC

Injection Site and Needle Size	
Subcutaneous (SC) injection	
Use a 23–25 gauge, ⅝", needle. Inject in fatty tissue over triceps.	
Intramuscular (IM) injection	
Use a 22–25 gauge needle. Inject in deltoid muscle of arm. Choose the needle length as indicated below:	
Gender/Weight	**Needle Length**
Male or female less than 130 lbs	⅝"*–1"
Female 130–200 lbs	1–1½"
Male 130–260 lbs	
Female 200+ lbs	1½"
Male 260+ lbs	

*A ⅝" needle may be used for patients weighing less than 130 lbs (<60 kg) for IM injection in the deltoid muscle only if the subcutaneous tissue is not bunched and the injection is made at a 90-degree angle.



Note: Always refer to the package insert included with each biologic for complete vaccine administration information. CDC's Advisory Committee on Immunization Practices (ACIP) recommendations for the particular vaccine should be reviewed as well. Access the ACIP recommendations at www.immunize.org/acip.

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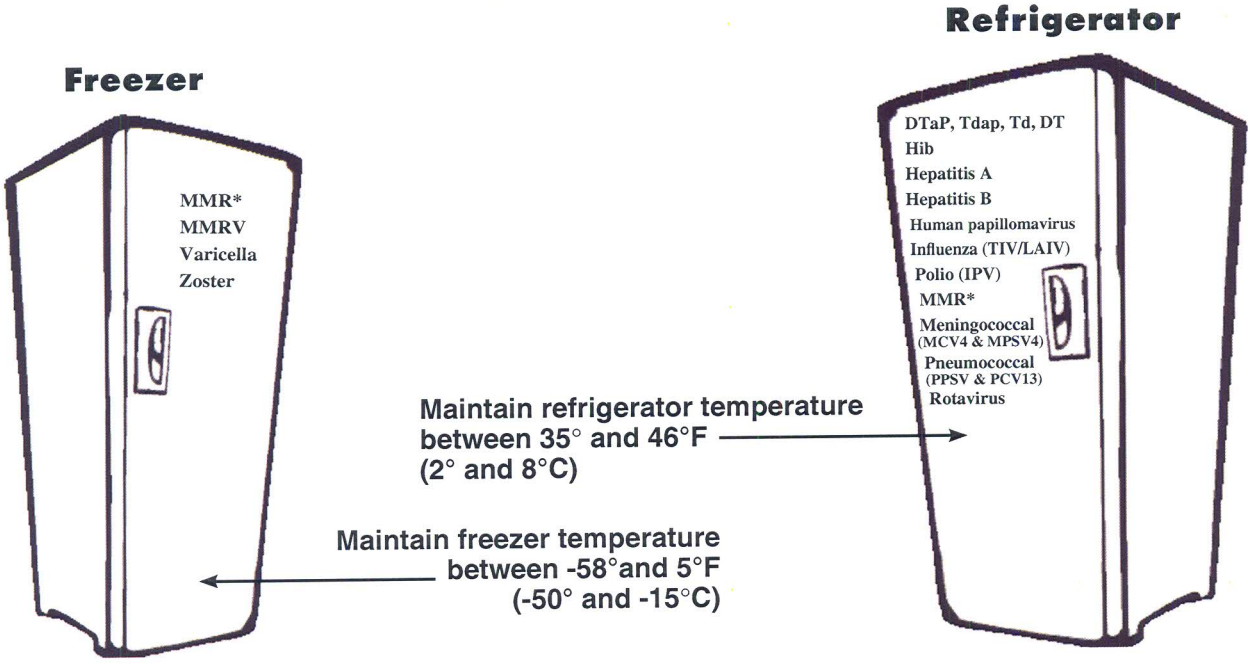
www.immunize.org/catg.d/p3084.pdf • Item #P3084 (7/12)

Vaccine Handling Tips

Outdated or improperly stored vaccines won't protect patients!



Manage vaccine inventories.

Inventory your vaccine supplies at least monthly and before placing an order. Expired vaccine must never be used and is money wasted!

Always use the vaccine with the soonest expiration date first.

Move vaccine with the soonest expiration date to the front of the storage unit and mark it to be used first. Keep vaccine vials in their original boxes.

Store vaccine appropriately.†

Place vaccines in refrigerator or freezer immediately upon receiving shipment. Keep vaccine vials in their original packaging. Place vaccine in clearly labeled wire baskets or other open containers with a 2–3" separation between baskets and from wall of unit. Separate vaccines that have been supplied from your state's Vaccines for Children program from vaccines that are privately purchased. Do not store vaccines in the door or on the floor of the unit.

Stabilize temperatures.

Store ice packs in the freezer and large jugs of water in the refrigerator along with the vaccines. This will help maintain a stable, cold temperature in case of a power failure or if the refrigerator or freezer doors are opened frequently or left open. Frequent opening of either the refrigerator or freezer door can lead to temperature variations inside, which could affect vaccine efficacy. For this reason you should not store food or beverages in the refrigerator or freezer.

Safeguard the electrical supply to the refrigerator.

Make sure the refrigerator and freezer are plugged into outlets in a protected area where they cannot be disconnected accidentally. Label the refrigerator, freezer, electrical outlets, fuses, and circuit breakers on the power circuit with information that clearly identifies the perishable nature of vaccines and the immediate steps to be taken in case of interruption of power. If your building has auxiliary power, use the outlet supplied by that system.

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*MMR may be stored in either the freezer or the refrigerator.

†Refer to package insert for specific instructions on the storage of each vaccine. If you have questions about the condition of the vaccine upon arrival, you should immediately place the vaccine in recommended storage, mark it "do not use," and then call your state health department or the vaccine manufacturer(s) to determine whether the potency of the vaccine(s) has been affected. For other questions, call the immunization program at your state or local health department.

Record your health department's phone number here: _____

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www.immunize.org/catg.d/p3048.pdf • Item #P3048 (12/11)

Resident Immunization Record

Name _____ Date of Birth _____

Resident's Identification Number _____ Sex: ___ F ___ M

Record of Immunizations Prior to Admission

Does this person have evidence of immunization for:

1. For the period October 1 through March 31, does the new arrival have evidence of an influenza vaccination for the current season? Yes ❑ No ❑

   Approximate date of immunization: _____

   Location of immunization (e.g. hospital, physician office): _____

2. Pneumococcal Vaccine? Yes ❑ No ❑

   Approximate date of immunization: _____

   Location of immunization (e.g. hospital, physician office): _____

   Where there is no documentation, or if evidence of immunization is uncertain, offer the immunization with appropriate counseling and consent. If the immunization is refused, document refusal at admission and offer again at a later time.

3. Tetanus-diphtheria (Td) toxoid during the past 10 years? Yes ❑ No ❑

   Approximate date of immunization: _____

   Location of immunization (e.g. hospital, physician office): _____

4. Herpes Zoster (Shingles) vaccine? Yes ❑ No ❑

   Approximate date of immunization: _____

   Location of immunization (e.g. hospital, physician office): _____

DO NOT REMOVE FROM CHART

Immunizations Administered Upon Admission

Vaccine	Trade Name or Manufacturer	Date Received	Injection Site	Vaccine Lot Number	Adverse reactions (0-72 hrs)	Administered by (Initial)
Influenza						
Pneumococcal						
Td						
Tdap						
Herpes Zoster						

Immunizations Administered While Residing in the Facility

Vaccine	Trade Name or Manufacturer	Date Received	Injection Site	Vaccine Lot Number	Adverse reactions (0-72 hrs)	Administered by (Initial)
Td						
Tdap						
Herpes Zoster						
Pneumococcal						
Pneumococcal						
Influenza						
Influenza						
Influenza						
Influenza						
Influenza						
Influenza						

DO NOT REMOVE FROM CHART

Vaccine Storage Troubleshooting Record

Use this page to record the details of the vaccine storage incident, including the date and time of the last known temperature within the appropriate vaccine storage range.

Date	Time	Storage Unit Temp	Room Temp	Incident	Action Taken	Results	Initials