



Department
of Health

Vaccines for Children (VFC) Program Training Setting Up Vaccine Storage Units

Division of Vaccine Excellence
Bureau of Vaccine Programs

SERIES 6



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Hello and welcome. In series 6 of this training, we will review how to properly set-up your vaccine storage units.

Set-up and preparation of your vaccine storage unit is extremely important. A properly organized vaccine storage unit helps to ensure correct vaccine storage and facilitates proper vaccine inventory management.

This training provides step by step instructions on how to set up vaccine storage equipment.

NYS VFC PROGRAM REQUIREMENTS: SETTING UP VACCINE STORAGE UNITS

- Notify the VFC Program any time a new/repaired unit will be set up and before a physical office move
- Call 1-800-543-7468 or email nyvfc@health.ny.gov
- Refer to training #5 for information on [specific unit requirements/selecting a vaccine storage unit](#)
- Demonstrate protection of vaccine storage unit power supply:
 - Use of warning labels such as "Do Not Disconnect" posted near each storage unit's electrical outlet and circuit breaker, and near any backup generators (if applicable). Stickers are available through your VFC Regional Representative
 - Appropriate policies/protocols in place to protect the power source
- At least five business days of in-range temperatures need to be recorded in the unit prior to use
- Separate public and private stock and label accordingly



Refer to this training for setting up your unit when you: move locations, purchase a new unit, or remove vaccine from a unit for maintenance. You must notify the VFC program any time you are setting up a new unit or you move locations. Notify the VFC Program any time you intend to set up a new unit and/or before a physical office move. The 5th training in this series, Selecting a Vaccine Storage Unit, gives specific requirements for storage units.

The VFC program requires that you:

Demonstrate proper protection of your vaccine storage unit's power supply. This can be done by posting warning labels such as "Do not Disconnect" near the unit's electrical outlets, near related circuit breakers and near any backup generators, if applicable. If this cannot be demonstrated, the NYS

VFC program may reject or hold vaccine orders.

You have 5 business days of in-range temperatures recorded for each storage unit before it can be used for vaccine storage. Otherwise, your vaccine orders may be denied.

Private vaccine stock must be physically separate from public (VFC) stock.

VACCINE STORAGE UNIT SETUP

- Place storage unit in a room on a dedicated circuit breaker, if possible
- Place in a well-ventilated room, away from direct sunlight and heat sources
- Leave space around the top and sides, at least 4 inches (10 cm) of space between the unit and wall
- Do not block the motor/compressor compartment
- Keep the unit level, at least 1 to 2 inches above the floor (may have to adjust the legs)
- Refer to the owner's manual for additional information



The location of your vaccine storage units within your practice is important to maintaining the vaccine cold chain.

If possible, place your vaccine storage units in an area that is on a single, dedicated circuit breaker. This helps to reduce the possibility that the power will be accidentally interrupted. If you are unsure of your facility's power structure, consult with maintenance staff.

The unit(s) should be placed in a well-ventilated room, away from direct sunlight and heat sources.

Allow space around the top and the sides of the unit. It is recommended to allow at least 4 inches of space between the unit and the wall, if possible, while also ensuring that the motor compartment is

not blocked.

Keep the unit level, at least 1-2 inches above the floor.

Always refer to the owner's manual for additional guidance on placement and any space requirements that may be specific to your unit.

PREPARING STORAGE UNITS

Unit Exterior

Protect the power supply

- Plug unit directly into an outlet. **DO NOT** use extension cords or power strips.
- Do not use power outlets:
 - That are built-in circuit switches or ground flow circuit interrupters (GCFIs)
 - That can be activated by a wall switch
- Put up appropriate warning signs
 - Near main power outlet and on circuit breaker(s)
 - “Do not adjust thermostat”* on storage units
- Place temperature logs outside of units



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*only trained VFC staff may adjust the storage unit temperature, if needed



Examples of warning signs to place near storage units and power supply

See Resources document for link to temperature log forms

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The use of a safety lock or outlet cover is strongly recommended to prevent staff from accidentally unplugging the unit.

Plug the vaccine storage unit directly into a wall or floor outlet. Do not use an extension cord. Avoid using power outlets with built-in circuit switches or Ground Flow Circuit Interrupters or GCFIs (GCFIs have reset buttons).

Do not use power outlets that can be activated or inactivated by a wall switch. Don't use multi-outlet power strips or surge protectors.

Place warning signs near the unit's main outlet and any associated circuit breaker(s) informing staff and others not to unplug the storage unit or disconnect power. The warning sign should also indicate a contact person in the event of an electrical problem or any scheduled

maintenance that needs to occur.

Maintenance and custodial staff should be instructed to never unplug the vaccine storage units or to notify the appropriate person if power needs to be shut off.

Place a warning sign on the front of the unit informing staff not to adjust the thermostat. Only the Vaccine Coordinator (or Back-up) should adjust the temperature.

Examples of warning signs are on the right of this slide.

Place the paper temperature log on the front of the unit to help facilitate the recording of daily temperature readings. Please refer to the Resources slide for a link to temperature logs.

Consider placing a tally sheet on the front of the unit to help account for wasted doses of vaccine (e.g., doses that were discarded after being dropped or broken, drawn up but not used, etc.)

PREPARING STORAGE UNITS



Image obtained from the Centers for Disease Control's Vaccine Storage and Handling Toolkit



Unit Interior

Refrigerator

- Place water bottles on shelves on doors, top shelf and floor of the unit and label "Do Not Drink"
- **If pharmaceutical/purpose-built unit, refer to user manual regarding use of water bottles, as they are not recommended for some units**

Freezer

- Place frozen water bottles along the walls, back and bottom and on door shelves (if applicable) of commercial units
- **If pharmaceutical/purpose-built unit, refer to user manual regarding use of water bottles, as they are not recommended for some units**

*****DO NOT BLOCK AIR VENTS*****



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Water bottles in the refrigerator and frozen water bottles in the freezer help to stabilize unit temperatures in the event of a power failure. Additionally, the frozen water bottles can be used to transport vaccine during an emergency.

For the refrigerator, place water bottles on shelves on doors, top shelf and floor of the unit and label "Do Not Drink".

If you are using a standard upright freezer place frozen water bottles in the door and along the top shelf and floor. If you are using a chest freezer, place the water bottles in the basket. If there is no basket, place the frozen water bottles along the bottom of the unit.

Water bottles are not recommended for use with certain pharmaceutical-grade and purpose-built units. For such units, follow the manufacturer's guidance.

Do not block the cold air vents when placing water bottles inside your

units. Locations of cold air vents can vary according to the model. Refer to the product user manual for information.

THERMOSTAT AND TEMPERATURE MONITORING DEVICE SETUP

Thermostat

- Thermostat controls can have various types of markings for temperature settings.
 - It is critical that you consult the user manual to understand the setting markings to set to the appropriate temperature (i.e.: know which direction is colder versus warmer on a dial-type thermostat).
- Refrigerator or freezer thermostats should be set at the factory-set (for purpose-built units) or at the midpoint of the temperature range, which will decrease the likelihood of temperature excursions.

Temperature Monitoring Device and Probe

- Place the probe of a calibrated, buffered temperature monitoring device called a Digital Data Logger (DDL) in the center of the unit.
- Attach the digital display of the DDL on the outside of the unit.
- Monitor temperatures in new and repaired units, twice daily for at least 5 days before use.



Image obtained from EZIZ Data Logger Setup & Use Resource Guide



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Thermostat labels can vary depending on the type of unit being used. Markings on the control knobs can range from sequential numbers, to letters, to cold, colder and coldest type of settings. Some thermostats do not show temperatures, but rather levels of coldness. It's preferable to have a digital thermostat with an actual numeric temperature value.

The acceptable temperature range for refrigerated vaccine is between 36 and 46° Fahrenheit or 2 and 8° Celsius. The ideal set temperature for the refrigerator is 41° Fahrenheit or 5° Celsius. The acceptable temperature range for frozen vaccine is between -58° and +5° Fahrenheit or between negative 50° and negative 15° Celsius, with some exceptions. Please refer to vaccine product insert for specific storage temperature guidance.

Consult your owner's manual for complete instructions on how to operate your thermostat. Several temperature adjustments may need to be made before the desired temperature is reached.

Set up a continuous temperature monitoring device, called a digital data

logger along with its buffered probe. Place the digital data logger probe in the center of the unit. Ideally this should be hung, and not resting on any shelves etc.

Follow the product instructions for installation. Many products will come standard with zip ties to secure the probe cable along the bottom of the shelves, so that it is kept out of the way when accessing vaccine.

Attach the digital display for the digital data logger on the outside of the unit. The display can be placed on the door or on the side of the unit. Make sure that the display will not be disrupted by the opening and closing of the door and/or regular foot traffic.

The NYS VFC Program requires that you monitor the temperatures in the new/repaired unit(s) for at least five business days before moving vaccine into it. It may take 2 to 7 days to stabilize the temperature in a newly installed or repaired unit.

STORAGE OF REFRIGERATED AND FROZEN VACCINES

Refrigerator Store between 2°C and 8°C (36°F and 46°F)	
Vaccine	Product Name
COVID-19*	Comimaty, Novavax
Dengue	Dengvaxia
DTaP	Daptacel, Infanrix
HepA	Havrix, Vaqta
HepB	Engerix-B, Hepislav-B, RecombivaxHB, Prehevbrio
Hib	ActHib, Hiberix, PedvaxHib
HPV	Gardasil 9
IV	Afluria, Flud, Flublok, Flucevax, FluLaval, Fluarix, Fluvirin, Fluzone, Fluzone High-Dose
IPV	Ipol
LAV	Flumist
MMR	M-M-R II*, Priorix
MenACWY	MenQuadfi, Menveo
MenB	Bexsero, Trumenba
Nirsevimab	Beyfortus
PCV15	Vaxneuvance
PCV20	Prennar20
PPSV23	Pneumovax 23
RSV	Abrysvo, Arexvy
RV1	Rotarix
RV5	RotaTeq
RZV	Shingrix
Tdap	Adacel, Boostrix
Td	Tenivac, TDVax
Combination Vaccines	
DTaP-HepB-IPV	Pediarix
DTaP-IPV	Kinrix, Quadracel
DTaP-IPV/Hib	Pentacel
DTaP-IPV-Hib-HepB	Vaxelis
HepA-HepB	Twinrix
MenABCWY	Penbraya

- Improperly stored or outdated vaccines won't protect your patients, and is not consistent with VFC requirements
- Refer to package insert for specific instructions on the storage of each vaccine
- All Moderna COVID-19 vaccine formulations can be stored in the refrigerator for up to 30 days after standard freezer storage
- † MMR II may be stored in the refrigerator OR freezer
- While this guide is current as of the time of recording, not all Flu vaccines listed her may be available for orders



This slide lists which vaccines can be stored in the refrigerator. Improperly stored or outdated vaccines won't protect your patients, and is not consistent with VFC requirements. Refer to package insert for specific instructions on the storage of each vaccine.

Please note the following:

All Moderna Covid-19 vaccine formulations can be stored in the refrigerator for up to 30 days after standard freezer storage.

MMR can be stored in the refrigerator or freezer.

While this guide is current as of the time of this recording, not all of the flu vaccines listed here may be available for order.

STORAGE OF REFRIGERATED AND FROZEN VACCINES

Freezer Store between -50°C and -15°C (-58°F and 5°F)	
Vaccine	Product Name
COVID-19*	Spikevax, Moderna (EUA)
Var [‡]	Varivax
Mpox [¶]	Jynneos
Combination Vaccines	
MMRV [§]	Proquad

Ultra-Cold Freezer Store between -90°C and -60°C (-130°F and -76°F)	
COVID-19*	Comirnaty, Pfizer-BioNTech (EUA)

- *Comirnaty and Pfizer-BioNTech COVID-19 vaccines in single-dose vials, multidose vials, and plastic manufacturer-filled syringes can be stored between 2°C and 8°C (36°F and 46°F) for up to 10 weeks. Glass manufacturer-filled syringes for persons 12 years of age and older may be stored at refrigerated temperatures until the expiration date. Spikevax and Moderna COVID-19 vaccines may be stored between 2°C and 8°C (36°F and 46°F) for up to 30 days.
- ‡ Comirnaty glass manufacturer-filled syringes for persons 12 years and older can not be stored at ultra cold temperatures.
- § Do not freeze diluent. Store at room temperature or refrigerated temperatures.
- ¶ Jynneos can be stored for 8 weeks at refrigerator temperatures



This slide lists which vaccines can be stored in the freezer and ultra cold freezer.

Please note:

*Comirnaty and Pfizer-BioNTech COVID-19 vaccines in single-dose vials, multidose vials, and plastic manufacturer-filled syringes can be stored between 2°C and 8°C (36°F and 46°F) for up to 10 weeks. Glass manufacturer-filled syringes for persons 12 years of age and older may be stored at refrigerated temperatures until the expiration date.

Spikevax and Moderna COVID-19 vaccines may be stored between 2°C and 8°C (36°F and 46°F) for up to 30 days.

‡ Comirnaty glass manufacturer-filled syringes for persons 12 years and older can not be stored at ultra cold temperatures. § Do not freeze diluent. Store at room temperature or refrigerated temperatures.

¶ Jynneos can be stored for 8 weeks at refrigerator temperatures

ULTRA-COLD STORAGE

- **Only certain Pfizer Covid-19 vaccines** may be stored in a special type of freezer called an ultra-cold storage unit. These specialty units are designed to maintain sub-zero temperatures between -90°C and -60°C (-130°F and -76°F)
- The following Pfizer Covid-19 vaccines may be stored in an ultra-cold unit between -90°C and -60°C (-130°F and -76°F) until the manufacturer's expiration date:
 - 6 months to 4 years (yellow cap/yellow label)
 - 5 -11 years (blue cap/blue label)
- **Please note that ultra-cold units require use of a special data logger designed to record these sub-zero temperatures. These ultra-cold data loggers do not have probes in a glycol vial as glycol would freeze at these sub-zero temperatures**



Ultra cold storage units are specialty freezer units specifically designed to maintain sub-zero temperatures. The 6 month to 4 year and 5 -11 years Pfizer Covid-19 vaccine formulations can be stored in ultra-cold units between -90°C and -60°C (-130°F and -76°F) until the manufacturer's expiration date.

Please note that standard and pharmaceutical freezer units are not capable of maintaining these ultra-cold temperatures and therefore should never be used to store any Pfizer Covid-19 vaccines.

STORAGE OF DILUENTS

- Always refer to vaccine manufacturer's product information for diluent storage, handling, and administration
 - Some diluents **must** be stored in the refrigerator
 - Other diluents have an option - either refrigerator or room temperature (no warmer than 77°F/25°C)
 - **NEVER** store diluent in the freezer!
- Only use the diluent provided by the manufacturer for that specific vaccine, as indicated
 - **Diluents are not interchangeable and can only be used with the product for which they are provided**
 - Be sure to store with/near corresponding refrigerated vaccine
 - For example, diluents for Pentacel (DTaP-IPV-Hib combo vaccine) and Menveo* (meningococcal conjugate vaccine) contain vaccine antigen; they are packaged together with the corresponding lyophilized vaccine and **MUST** be stored together



*Applies to 2-vial Menveo NDC 58160-0955-09



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Some diluents need to be stored in a refrigerator, while others have an option of being stored in either the refrigerator or room temperature. If storing diluents at room temperature, the room should reach no warmer than 77° F or 25°C.

Always refer to the manufacturer's product information to find the appropriate storage temperatures for the diluent in question.

As a reminder, diluents should never be stored in the freezer. Store diluents with their corresponding vaccine to avoid errors/use of incorrect diluent. Diluents are not interchangeable and can only be used with the product for which they are provided.

The diluent for Pentacel (DTaP-IPV-Hib combo vaccine) and the diluent for Menveo (meningococcal conjugate vaccine) contain a vaccine antigen and will usually come packaged with their corresponding lyophilized vaccine. These diluents must be stored along with their corresponding vaccine.

VACCINE STORAGE UNIT ORGANIZATION

- Before ordering vaccines, develop a plan for organizing and separating public vaccine stock from private vaccine stock
 - If stored in the same unit, private and public inventory should be on separate shelves/bins and labeled accordingly
- **Do not store food or beverages in the units**
- Storage of other medications and biologics in the same unit is not recommended
- Do not crowd vaccines; allow for air flow throughout the unit



Image obtained from the Centers for Disease Control's Vaccine Storage and Handling Toolkit

Transferring vaccines and diluents into a unit requires some forethought and planning on how to best organize the unit. A carefully organized vaccine storage unit helps protect vaccine and facilitates vaccine inventory management.

It should go without saying, but never store food or beverages in the units where you store vaccine.

Storage of other medications and biologics in same unit as vaccine is not recommended. However, if it is necessary, store below vaccines and label appropriately.

Prevent overcrowding vaccines for adequate airflow. If you find that your unit is not large enough to accommodate your inventory, you may be required to purchase a second unit.

VACCINE STORAGE UNIT ORGANIZATION

- Use trays or uncovered vented baskets/containers to store vaccines
- Label the baskets and shelves with name of vaccine and funding type (public vs private). Attach labels to shelves, trays and/or baskets where each type of vaccine is stored.
- Separate stock of:
 - private and public
 - adult and pediatric
 - similarly named vaccines (i.e. DTaP vs Tdap)
- Rotate vaccine stock to keep most recent expiration dates at the front
- Allow at least 2-3 inches of space between vaccine/diluent and the walls of the unit



- **Do not** store vaccines on/in the doors or in the drawers (if applicable) of the units
- Keep vaccines and diluent in the original packaging with the lids closed
- Diluent should be stored with/near the corresponding vaccine
- Keep water bottles on the unit's doors and top shelf (for pharmaceutical units refer to the manual regarding water bottle usage)



Image obtained by CDC training "You Call The Shots"



For better organization, use trays or uncovered containers or baskets. Breathable plastic mesh baskets are best. Each basket should only contain one type of vaccine or diluent.

Clearly label the baskets and shelves with name of vaccine and funding type. Attach labels to shelves, trays and/or baskets where each type of vaccine is stored.

Separate private and public vaccine. Consider dedicating one shelf to each. Store pediatric and adult versions of the same vaccine on separate shelves to avoid confusion. Also, keep vaccines with similar packaging and names on different shelves. For example: DTaP and Tdap OR Hib and Hep B.

Always place vaccine with the earliest vaccine expiration date towards the front of each basket.

Vaccines and diluents should be placed in the central area of the storage unit, 2 to 3 inches away from storage unit walls.

Never store vaccine in the door of the unit or in any drawers in the unit. The door is subject to temperature variations. Drawers in units limit circulating air flow and often maintain different temperatures from the rest of the unit.

Avoid placing vaccine near cold air vents, which are typically located near the top shelf in commercial units. If you have to use the top shelf, place water bottles in the back, close to vent and store vaccine not sensitive to coldest temps such as MMR, for example.

Keep vaccines and diluents in their original packaging with lids closed until ready for administration. This will protect the vaccines from damage due to light. Removing vaccines from their packaging also increases risk for storage and handling and administration errors.

Place water bottles anywhere in the unit where you would not place vaccine, such as in the doors, in the top shelves, and in any vegetable bins or drawers. Again, if you have a pharmaceutical unit, please refer to the unit's manual regarding use of water bottles, as they are not recommended for some models.

After reviewing the storage and handling protocols of all the vaccines and their diluents, begin transferring the vaccines and diluents into the units.

THANK YOU!



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Thank you for your participation in this training on setting up your vaccine storage units. As always, any questions can be sent to nyvfc@health.ny.gov.