

Ultra-Cold Vaccine Planning Considerations

What is ultra-cold storage for vaccine?

- Ultra-cold vaccine storage is the storing of frozen vaccine in temperatures colder than -70°C. This type of storage requires specialized storage containers and dry ice to maintain the proper storage conditions. An ultra-cold freezer may be used if it can maintain temperatures colder than -70°C. If an ultra-cold freezer is unavailable, then the shipping container must be used to store the vaccine.

Standard refrigerators and freezers will not maintain cold enough temperatures for long-term storage.

Important information regarding ultra-cold storage containers:

Usage of the ultra-cold storage container:

- The shipping container must be replenished with fresh dry ice according to manufacturer guidelines.
- The shipping containers will maintain proper temperatures if the container is kept sealed and opened according to manufacturer guidelines.

Placement of the ultra-cold storage container:

- Always store the shipping container in a well-ventilated area.
- Avoid keeping the shipping container in an unventilated room, cellar, or automobile.
- Dry ice will produce carbon dioxide gas. At elevated concentrations, carbon dioxide gas can be fatal when inhaled.

Considerations for handling ultra-cold vaccine:

- To ensure proper temperatures are maintained, only open the storage container according to manufacturer guidelines (example: one to two times per day).
- Additional PPE will be required to remove the vaccine and to replenish the dry ice within the ultra-cold storage containers. Protective gloves, long sleeves and a face shield will need to be provided for all personnel that will be removing the vaccine or replenishing the dry ice within the ultra-cold storage container.

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Personnel training: Personnel will need to be trained on the proper handling procedures including:

- Restrictions to opening the ultra-cold shipping container and/or ultra-cold freezer.
- The need to thaw the vaccine, while maintaining the proper cold chain conditions.
- Mixing of the vaccine with the manufacturer-specific diluent.
- Monitoring temperature probes to ensure the vaccine is kept at the proper temperatures
- Direct handling of dry ice
- Procedures for returning the ultra-cold shipping container

Special planning considerations:

- Ultra-cold stored vaccine will arrive at the facility in an ultra-cold shipping container. These shipping containers are specially designed for the storage of ultra-cold vaccine and may be required to be returned.
- Ultra-cold shipping containers must be regularly replenished with dry ice according to manufacturer guidelines. This may require additional personnel and the identification of dry ice suppliers within the jurisdiction.
- A list of pre-identified dry ice suppliers within the jurisdiction should be generated and be posted close to the ultra-cold shipping container. The list should include name, address and phone number of each supplier.
- Training materials and handling procedures may need to be created and distributed to personnel.
- Once the vaccine is removed from the ultra-cold shipping container it must be stored and administered according to manufacturer guidelines.

Training materials and handling procedures:

- Training materials and handling procedures may need to be created and distributed to personnel.
- **Resources for creating procedures and trainings:**
 - [CDC Storage and Handling Toolkit](#)
 - [CDC COVID-19 Vaccination Resources](#)
 - [CDC COVID-19 Vaccination Program Playbook](#)
 - [CDC Curbside Vaccination Clinic Guidance](#)

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Dry Ice Safety:

Handling precautions:

- The temperature of dry ice is extremely cold at -78°C .
- Do not allow dry ice to touch bare skin. Dry ice that comes in contact with skin may result in frostbite. Prolonged exposure will cause severe frostbite.
- Always wear protective thermal gloves, long sleeves and a face shield whenever handling dry ice.

Storing dry ice:

- Dry ice will produce carbon dioxide gas.
- Always store dry ice in a well-ventilated area. Avoid storing dry ice in an unventilated room, cellar, or automobile. At elevated concentrations, carbon dioxide gas can be fatal when inhaled.
- Store dry ice in an insulated container. The better the insulation, the longer the dry ice will last.
- Dry ice should not be stored in a refrigerator or a freezer.
- Dry ice should not be stored in an airtight or glass container. As dry ice turns into carbon dioxide gas, the gas will cause an airtight container to expand, rupture, or burst.
- Some surfaces left in direct contact with dry ice may be damaged by the extreme cold. Adhesives may become brittle and break.

Transporting dry ice:

- Plan to pick-up dry ice as close as possible to the time it is needed.
- Bring a well-insulated container such as a camping cooler, ice chest, or cold storage box.
- If it is transported inside a car or van, make sure there is a constant supply of fresh air.
- If possible, transport outside of the main cab of the vehicle.

Ventilation requirements:

- If the concentration of carbon dioxide in the air rises above 0.5%, it becomes dangerous.
- Carbon dioxide is heavier than air and will accumulate in low spaces. Do not enter closed dry ice storage areas without first ventilating the space.
- Limit your exposure to dry ice and only handle as needed.