Managing Vaccine

How to keep vaccines viable and patients protected

Only viable vaccine will protect your patients. You can’t tell by looking at vaccine whether it has lost potency through mishandling or improper storage. Everyone who works with vaccines must to be familiar with best practices for minimizing the risk of vaccine becoming nonviable.

Overview of this section

Best Practices Checklist: Managing Vaccine
Managing Your Vaccine
Ordering Vaccine and Managing Inventory
Receiving Vaccine
Storing and Handling Vaccine
Disposing of Vaccine
Planning for Vaccine Storage Emergencies
Packing and Transporting Vaccine
Key Resources for Managing Vaccine

"It is better to NOT vaccinate than to administer a mishandled vaccine!!"
Donna Weaver, CDC

Who to Call
Minnesota Vaccines for Children
651-201-5522
Minnesota Immunization Program
800-657-3970
651-201-5503
Best Practices Checklist: Managing Vaccine

The information in this checklist will be covered in more detail throughout this section.

### Ordering vaccine and managing inventory
- We keep an up-to-date list of the vaccines our clinic uses and where/how to order them.
- We check our vaccine inventory at least monthly and with each vaccine order.
- We rotate vaccines at least monthly by placing lots with the earliest expiration dates in front so they will be used first.

### Receiving vaccine
- We make sure all staff know what to do with vaccine when it arrives.
- We train our staff on the appropriate arrival condition of each vaccine.
- We keep a log of all vaccines received.

### Storing and handling vaccine
- We train our staff to be familiar with proper vaccine storage and handling (e.g., protecting MMR from light, refrigerated vs. frozen vaccines).
- We use refrigerator(s) and freezer(s) that meet all the specifications for proper vaccine storage.
- We store vaccine in the recommended compartments - frozen vaccine in the freezer and refrigerated vaccine in the refrigerator.
- We use our refrigerators and freezer only for vaccine storage (i.e., no food or beverages).
- We only use calibrated thermometers.
- We check and record temperatures on a log twice a day and post it on the refrigerator/freezer door.
- We train our staff to take immediate action when temperatures are out of range.
- We perform routine maintenance on our vaccine storage units.
- We safeguard the power supply of our vaccine storage units by posting *Do Not Unplug* and *Warning* stickers.

### Disposing of vaccine
- We dispose of spoiled or expired vaccine and diluents properly.

### Planning for vaccine storage emergencies
- We have a plan for storing and transporting vaccine in an emergency and staff are trained accordingly.
- We have identified an alternate site to store vaccine in case of a lengthy power outage.

### Packing and transporting vaccine
- We keep a list of clinics and contact names in case we need to transfer or transport vaccine.
- We use coolers and thermometers that meet all the specifications for transferring or transporting vaccine.
- Our staff is familiar with how to pack vaccine according to established standards.
- We keep a list of packing suppliers.
Managing Your Vaccine

Vaccines are expensive — one of the most valuable assets a clinic has — so it is important to keep them safe. Taking care that all staff adhere to vaccine management policies will best protect this costly asset.

The cost of vaccine adds up quickly — even for a small immunization clinic. Take a moment to think about what your clinic's refrigerator and freezer are worth and make a commitment to adopt solid storage and handling policies.

What’s your refrigerator and freezer worth? Over $38,000.00!*

Value of vaccine in refrigerator not including flu = $24,151.10
Value of vaccine in refrigerator including flu = $30,816.50

*Based on 2010 vaccine prices and inventory of a small clinic. Brand name identification is for sample purposes and is not an endorsement of one product brand over another.
Ordering Vaccine and Managing Inventory

General instructions for ordering vaccine
- Write a procedure for the primary and backup vaccine coordinators to follow for ordering vaccine from both the MnVFC program and from manufacturers/distributors.
- Keep an up-to-date list of the vaccines your clinic uses and where to order them.

Managing vaccine inventory
- Review your vaccine inventory each month and with each vaccine order to avoid over-ordering. Make sure you:
  - Check vaccine expiration dates.
  - Rotate your supply by placing vaccines with the earliest expiration dates in front of others and always using them first. Mark the packages "use first" to alert staff. If the expiration date is listed by month and year, the vaccine expires the last day of the month (for example, "06/2011" means the vaccine will expire on June 30, 2011).
- Keep a log of all vaccines in inventory; see Monthly Vaccine Inventory Log on page 39. At the very least, make sure you record the:
  - Vaccine name
  - Manufacturer
  - Lot number
  - Number of doses
  - Expiration date
  - Date of receipt
  - National Drug Code (NDC) number
- Use the log as a tool to provide information on how much of each vaccine your clinic uses. You may need to refer to it if you have a storage and handling mishap or if you need to find a recalled vaccine.

Implementing a new combination vaccine
- Work with the physician(s) on staff to use up current stock of vaccine while transitioning to the new combination vaccine (i.e., completing a series with the current brand and starting the new vaccine only in children beginning a series).
- If you have excess vaccine you won’t use after transitioning to the new combination vaccine try to transfer it to another clinic where it can be used before it expires.

TAKE ACTION

If you have excess vaccine or vaccine that will expire within three months:
1. Don’t wait until the last minute. Determine which vaccines can be used before they expire.
2. Transfer vaccines you won’t use to another clinic where they can be used before they expire.
3. If it is MnVFC vaccine, call the MnVFC program at 651-201-5522 for guidance. For private purchase vaccine, check your purchase agreement for guidance.
General instructions for receiving vaccine

- Write a procedure for receiving vaccine.
- Make sure all staff know what to do with vaccine when it arrives.
- Be familiar with the appropriate arrival condition of each vaccine; see Guide to Receiving, Storing, and Handling Vaccines on page 19.
- Open containers immediately upon receipt, inspect vaccine for damage, and check the warm- or cold-mark temperature indicators (if included in the package). If you have questions about the condition or viability of the vaccine at the time of delivery, see the TAKE ACTION box on page 6.
- Check quantities ordered, lot numbers, and expiration dates against the invoice or packing slip. For MnVFC vaccine, report any discrepancies or concerns within two hours of receiving the vaccine. For private purchase vaccine, check your purchase agreement for guidance.
- Keep invoices and/or packing slips and record the date the vaccine was received on them.

Receiving MMRV, varicella, and zoster vaccine

- Regardless of whether these vaccines are ordered privately or come from the MnVFC program, they are shipped directly to the clinic from the manufacturer/distributor.
- MMRV, varicella, and zoster vaccines should arrive frozen.
- Based on manufacturer recommendations, redistribution of MMRV, varicella, and zoster vaccines to other clinic sites is not allowed. Redistribution of these vaccines is not allowed by the MnVFC program.
- If you receive MnVFC MMRV, varicella, or zoster vaccine from somewhere other than the manufacturer (i.e., your parent clinic or central pharmacy) please call the MnVFC program for guidance.

Did you know that MIIC can help you manage vaccine inventory? Here’s how:

- When you receive vaccine, record it in MIIC.
- Each time a vaccine is given MIIC tracks the amount of vaccine left in inventory.
- MIIC automatically inserts the lot number, expiration date, and manufacturer when you enter each vaccination.
- Using MIIC takes a little time up front but will save many steps in the long run.
If you have questions about the condition or viability of the vaccine at the time of delivery, for example:

- Refrigerated vaccines arrive warm or frozen.
- MMRV, varicella, or zoster vaccine arrives thawed.
- The color of the cold- or warm-mark temperature indicator (if included in the package) has changed or the thermometer indicates an out-of-range temperature.
- Vaccine vials or syringes are damaged.

1. **Mark the vaccine** “DO NOT USE” so staff won’t inadvertently administer it.

2. **Store the vaccine at the correct temperature** – apart from other vaccines – until you can determine if it is viable. Do not throw it away!

3. **Call the MnVFC program within two hours** of receipt if the vaccine in question is from MnVFC. For private purchase vaccine, check your purchase agreement for guidance.
   - Be ready to provide temperature details, lot numbers, and expiration dates.
   - If you are instructed to contact the manufacturer, make sure to ask to speak to the medical consultant or quality assurance staff.

3. **Document your actions;** see Vaccine Troubleshooting Log on page 51.
DH does not endorse or recommend a particular brand of refrigerator/freezer or thermometer, but we do recommend certain features.

**Have the right refrigerators/freezers**

Use the *Volume Based Refrigerator and Freezer Recommendations* table on page 9 to help you choose the right refrigerator and/or freezer for your facility based on the volume of vaccine you need to store.

**Essential refrigerator/freezer features**

- Ability to maintain uniform temperatures, preferably with a preset temperature of 40°F (4°C) in a refrigerator and 0°F (-18°C) or colder in a freezer
- Enough usable space to hold the year’s largest inventory, such as the back-to-school rush or flu season, and still have room for air circulation
- Automatic defrost cycle
- Separate exterior doors and separate controls in each compartment if using a combination refrigerator/freezer

**Desirable refrigerator/freezer features**

- Negative-pressure doors that close automatically
- Built-in thermometers that come with a certificate stating they have been calibrated according to standards set by the National Institute of Standards and Technology
- Security locks
- Wire racks (as opposed to glass)
- Visible temperature displays

**Unacceptable refrigerator/freezer features**

- Visible cooling plates or open coils on the back wall of the unit
- Combination refrigerator/freezer with one exterior door, including lab- or pharmacy-grade units, because they are unable to maintain the temperatures needed for storing vaccines
- A manual defrost freezer combined with a cyclic defrost refrigerator compartment

Don't use a combination refrigerator/freezer with one exterior door because they are unable to maintain the temperatures needed for storing vaccines.
<table>
<thead>
<tr>
<th>Storage unit type</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
</table>
| Lab- or pharmacy-grade purpose-built:  | - Able to maintain stable temperatures  
  - Temperatures can be pre-set  
  - Good temperature recovery after the unit has been opened to get vaccines  
  - All internal space in the unit can be used to store vaccines  
  - Most provide an internal thermometer with an external display  
  - Offers the option of alarm and safety features to alert you to and/or minimize temperature fluctuations  
  - Includes key locks so only authorized staff can lock and unlock the doors  
  - Variety of sizes are available                                                                                                                                 | - May be the most expensive option  
  - Sold by specialty distributors so may be less convenient to buy  
  - Having the built-in thermometer calibrated maybe an additional cost  
  - Should be plugged into a back-up emergency power supply (additional cost)                                                                 |
| - Refrigerator-only                    |                                                                                                                                                                                                          |                                                                                                                                                                                                             |
| - Freezer-only                         |                                                                                                                                                                                                          |                                                                                                                                                                                                             |
| - Under-counter refrigerator-only      |                                                                                                                                                                                                          |                                                                                                                                                                                                             |
| - Under-counter freezer-only           |                                                                                                                                                                                                          |                                                                                                                                                                                                             |
| Cost: $900 to $10,000                  |                                                                                                                                                                                                          |                                                                                                                                                                                                             |
| Household:                             | - Able to maintain stable temperatures  
  - Some units allow enough usable space for the year’s largest inventory, (e.g., back-to-school rush or flu season) and still have room for air circulation  
  - Available through major appliance retailers  
  - Variety of sizes are available  
  - More usable space than a household-style combination  
  - No cold air vent from freezer which provides more stable temperatures (refrigerator-only units)                                                                                                                                 | - Temperature control dial has arbitrary scale; difficult to accurately set desired temperature  
  - Changes in the room temperature affect the temperature inside the unit  
  - Defrost function can cause temperature fluctuations (freezer-only units)  
  - Slow temperature recovery  
  - Must also purchase a calibrated thermometer                                                                                                                                 |
| - Refrigerator-only                    |                                                                                                                                                                                                          |                                                                                                                                                                                                             |
| - Freezer-only                         |                                                                                                                                                                                                          |                                                                                                                                                                                                             |
| Cost: $400 to $4,000                   |                                                                                                                                                                                                          |                                                                                                                                                                                                             |
| Household-style combination (dual zone unit): | - Able to maintain stable temperatures  
  - Separate exterior doors and separate controls in each compartment  
  - Variety of sizes are available  
  - Available through major appliance retailers                                                                                                                                                  | - Usable space is limited in refrigerator compartment where only the middle shelves can be used  
  - Temperature control dial has arbitrary scale which makes it difficult to set temperature for each compartment; setting freezer at 0°F/-18°C or colder can make the temperature in the refrigerator too cold for refrigerated vaccines  
  - Changes in the room temperature affect the temperature inside the unit  
  - Defrost function can cause temperature fluctuations  
  - Slow temperature recovery  
  - Must also purchase a calibrated thermometer  
  - Smaller units (18 cubic feet or less) aren't able to maintain stable temperatures and may contain hot or cold spots that put vaccines at risk                                                                 |
<p>| - Refrigerator-freezer with separate exterior doors and separate controls in each compartment |                                                                                                                                                                                                          |                                                                                                                                                                                                             |
| Cost: $400 to $4,000                   |                                                                                                                                                                                                          |                                                                                                                                                                                                             |</p>
<table>
<thead>
<tr>
<th>Volume</th>
<th>Approximate doses/year</th>
<th>Recommended refrigerators/freezers</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>10,000 or more</td>
<td>• Large capacity purpose-built (lab or pharmacy grade) refrigerator-only or freezer-only unit designed for optimum cooling capacity and stable temperature control</td>
</tr>
</tbody>
</table>
| Medium | 2,000-10,000           | In order of preference, with the first being the best:  
• Purpose-built (lab or pharmacy grade) refrigerator-only or freezer-only unit designed for optimum cooling capacity and stable temperature control  
• Household refrigerator-only or freezer-only unit (can be an under-counter model) |
| Low    | 2,000 or less          | In order of preference, with the first being the best:  
• Smaller under-counter version of a purpose-built (lab or pharmacy grade) refrigerator-only or freezer-only unit  
• Household refrigerator-only or freezer-only unit  
• Household-style combination refrigerator/freezer with separate exterior doors and separate controls in each compartment |
**Safeguard the power supply**

- Place *Do Not Unplug* stickers on the:
  - Refrigerator/freezer
  - Power cord
  - Wall outlet
  - and *Warning* stickers on the circuit breaker/fuse box

- Plug refrigerators/freezers into backed-up (emergency power supply) power outlets, where available.

- Don’t plug refrigerators/freezers into ground fault circuit interrupter (GFI or GFCI) outlets or extension cords.

- Use "in-use outlet covers" or "safety-lock plugs" to avoid accidentally unplugging the unit. Some outlet covers also come with a locking mechanism.

- Plan in advance for needed maintenance/electrical work. Make sure you have a policy/plan in place for scheduled maintenance/electrical work that may interrupt the power. Communication with building maintenance staff is essential.

**Perform routine maintenance**

Keeping your refrigerators and freezers running properly requires some routine maintenance. Add these tasks to your storage and handling policy.

- For household-style refrigerators and freezers, each month:
  - Clean the inside when you do inventory.
  - Vacuum behind refrigerators/freezers and their coils.
  - Check and clean the door seals to make sure they are sealing completely.

- For purpose-built (lab or pharmacy grade) refrigerator-only or freezer-only:
  - Follow the manufacturer’s maintenance schedule.

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How to check the refrigerator or freezer door seal

*Place a piece of paper between the door and the unit and shut the door. If the paper stays in place, the seal is good. If the paper slides, the seal is bad.*
Have the right thermometers

Essential thermometer features
- A certificate stating the thermometer has been calibrated according to national standards (Without this certificate, thermometers are not acceptable because their accuracy cannot be guaranteed.)
- A battery backup, if the thermometer uses an electrical power source

Desirable thermometer features
- A probe inserted into a biosafe liquid (This more accurately reflects the actual temperature of the packaged vaccine inside the unit.)
- An internal probe and an external read (This allows you to read the temperature without opening the refrigerator/freezer.)
- An alarm for out-of-range temperatures
- Easy-to-read digital readout (So you don’t have to interpret a scale.)
- Provides a paper or electronic history of past temperatures
- Minimum/maximum display of the highest and lowest temperatures

Unacceptable thermometer features
- Doesn’t use a probe inserted into a biosafe liquid (So it only reads the air temperature inside the unit - not the temperature of the vaccine.)
- Doesn’t have external-read capability (You need to open the door to read the temperature.)
- Can’t be calibrated

Other considerations when purchasing a thermometer
- If your clinic maintains vaccine valued at $15,000 or more per year, consider purchasing a temperature alarm system that will notify staff after hours if temperatures are out of range; see Electronic temperature monitoring systems below.

- Make sure you have a backup thermometer to use for transport and in case your current thermometer stops functioning.
- If your thermometer uses batteries, replace them every six months.

Electronic temperature monitoring systems
If your clinic maintains vaccine valued at $15,000 or more per year, consider purchasing an electronic temperature monitoring system that will notify staff after hours if temperatures are out of range.

- Make sure you have a written policy for handling out-of-range temperatures that includes emergency 24-hour contacts and their backups.
- Set time and temperature alarm parameters to allow for changes in temperatures due to frequent opening of the unit during the day and for non-use during the night (e.g., set the alarm to go off if the refrigerator temperature is above 47°F or below 33.5°F for 30 minutes).
- Temperatures should still be checked and recorded manually twice a day.
Monitor temperatures twice a day
- Check and record temperatures of refrigerator(s) and freezer(s) twice a day – even if you have an electronic temperature monitoring system.
- If you use a minimum/maximum-type thermometer, make sure you reset the memory each time you check and record the temperatures (twice a day) and after an out-of-range temperature reading.
- Record temperature readings on a temperature log posted in a visible location on or near the refrigerator and freezer; see Vaccine Storage Temperature Logs on pages 47-50.
- Record temperature readings consistently in one scale, either Fahrenheit or Celsius.
- Keep temperature logs for three years. You may need to refer to them for temperature trends or if you have a storage and handling mishap.
- Take immediate action on all out-of-range temperatures! See the TAKE ACTION box on page 14.

Store vaccine and diluents correctly
- Place a thermometer in the center of the refrigerator and freezer near the vaccines.
- Use open trays, wire baskets, or other uncovered containers to help organize vaccines. Containers should have openings on all sides to allow air circulation around the vaccine.
- Clearly label each container with the vaccine type. Avoid storing "look-alike" and "sound-alike" vaccines next to each other (e.g., Tdap and DTaP, HepA and HepB and Hib).
- Keep vaccines in their original packaging to protect them from light.
- Store diluents packaged together with their corresponding vaccines (e.g., Pentacel, Menevo).
- Store diluents packaged separately from their corresponding vaccines in the refrigerator or at room temperature and clearly label them (e.g., MMR diluent, ActHIB diluent, Hiberix diluent).
- Open only one multi-dose vial of a specific vaccine at a time.
- Post a list on every refrigerator and freezer showing which vaccines are stored there.
- For storage of vaccines during off-site vaccination clinics, see Acceptable Coolers for Vaccine Transfer or Transport on page 35.
- For specific storage requirements for each vaccine, see Guide to Receiving, Storing, and Handling Vaccines on page 19.
Additional guidelines for storing vaccine in a household-style refrigerator or freezer

For an illustration of how to properly store vaccine in this type of unit, see the Vaccine Storage Guide on page 15.

- It is difficult to set the temperature for the freezer compartment of a household-style combination refrigerator/freezer at 0°F/-18°C or colder without making the temperature in the refrigerator too cold for refrigerated vaccines. If you use the freezer compartment of a household-style combination refrigerator/freezer to store frozen vaccine, consider purchasing a separate household freezer.

- Store vaccines only on the middle shelves and two to three inches from the walls of the refrigerator/freezer.

- Remove vegetable bins and crisper drawers or use the bins and drawers to store water bottles or jugs or other medical supplies (e.g., diabetic and lab supplies or allergy serum). This will help avoid storing vaccine in the wrong place.

- Keep vaccine away from the cold air vent in the refrigerator compartment.

- Keep water bottles, jugs, or cold packs in the refrigerator and frozen packs or other ice-filled containers in the freezer to help maintain temperatures. Water bottles can be stored in the door and water jugs in the bottom of the unit. Don't store gallon water jugs in the door because the door may not close properly. It's important to label any substance stored in the refrigerator, so make sure to label water bottles and water jugs.

- Consider locking the refrigerator or freezer at the end of the day to prevent accidently leaving the door ajar overnight.

- Make sure there is enough usable space to hold the year’s largest inventory, such as the back-to-school rush or flu season, and still have room for air circulation. If your refrigerator or freezer is packed full, consider purchasing a larger unit.
Storing and Handling Vaccine

**TAKE ACTION**

### On out-of-range temperatures:

**Refrigerator:**
- Below 35°F (2°C) (Aim for 40°F / 4°C)
- Above 46°F (8°C)

**Freezer:**
- Above 5°F (Aim for 0°F / -18°C)

1. **Determine the problem:** it might be easily corrected (e.g., door not closed tightly, unit malfunction, power outage).

2. **Adjust the thermostat,** if necessary.

3. **Keep refrigerator/freezer door closed.**

4. **Monitor the temperature every 30 minutes** until it stabilizes in the correct range. If the temperature doesn’t stabilize in the correct range within 30 minutes go to step 5.

5. **Immediately contact** your primary and backup vaccine coordinator and:
   - Emergency staff and others, as necessary
   - Alternate vaccine storage facility(s) if you are moving the vaccine to them

6. If the temperature remains out of range after checking every 30 minutes for two hours:
   - **Stop using the vaccine,** but do not throw it away!
   - **Mark the vaccine “DO NOT USE”** so staff won’t inadvertently administer it.
   - **Move the vaccine** to a refrigerator/freezer that’s maintaining the correct temperature – apart from other vaccines – until you can determine if it is viable.

7. **Call for guidance right away.** If the vaccine in question is from MnVFC, call the MnVFC program. For private purchase vaccine, check your purchase agreement for guidance.
   - Be ready to provide the temperature details, lot numbers, and expiration dates.
   - If you are instructed to contact the manufacturer, make sure to ask to speak to the medical consultant or quality assurance staff.

8. **Document your actions:** see Vaccine Troubleshooting Log on page 51.
Vaccine Storage Guide

Proper REFRIGERATOR Temperatures
Refrigerate anthrax, DTaP, DT, Td, Tdap, hepatitis A and B, Hib, HPV, influenza, IPV, Japanese encephalitis, meningococcal, pneumococcal, rabies, rotavirus, typhoid, and yellow fever.

Aim for 40°F (4°C)
Too cold
35°F (2°C) to 46°F (8°C) Too warm

Proper FREEZER Temperatures
Freeze MMR, MMRV, varicella, and zoster.
Don’t freeze liquid vaccines!

Aim for 0°F (-18°C)
Too cold
-58°F (-50°C) to 5°F (-15°C) Too warm

Proper Set-Up

Refrigerator-only unit
- No food or beverages in refrigerator!
- No vaccine in drawers or on floor of refrigerator!
- Fill space with cold packs or water bottles.

Freezer-only unit
- No food in freezer!
- No vaccine in freezer!
- X’s and lines show areas to avoid.

Combination refrigerator/freezer unit
- No vaccine in doors!
- Fill space with frozen packs.
- No vaccine near cold air vent!
- No vaccine on top shelf!
- No vaccine in drawers or on floor of refrigerator!
- Fill space with cold packs and water bottles.

For all units:
- Group vaccines by type.
- Clearly label the designated space for each vaccine.
- Keep vaccine 2-3 inches away from walls and other boxes.
- Post Do Not Unplug stickers on electrical outlets. Plug in only one unit per outlet.
- Place thermometer probe in the center of the unit.
- Post a temperature log on the door.

Available on the web at www.health.state.mn.us/divs/idepc/immunize/hcp/vaxhandling.html

Adapted with permission from the California Department of Public Health
Vaccine Storage Guide

Proper Management

Designate one fully trained staff member to be the primary vaccine coordinator and at least one person to be backup. Ensure ongoing training for all immunization staff.

Manage vaccine inventory

- Review your vaccine inventory on a monthly basis and with each vaccine order to avoid over-ordering.
- Check vaccine expiration dates.
- Rotate your vaccine supply by placing vaccines with the earliest expiration dates in front of other vaccines and always use them first.
- Identify vaccine that will expire and determine if it should be transferred.
- Call the MnVFC program if you have MnVFC vaccine that will expire within 3 months that you cannot use.
- If you have stock of both private and MnVFC vaccine, mark them clearly.

Store vaccine correctly

- Place a thermometer in the center of the refrigerator or freezer near the vaccines.
- Use open trays, wire baskets, or other uncovered containers to help organize vaccines.
- Clearly label each container with the vaccine type. Avoid storing look-alike, sound-alike vaccines next to each other (e.g., Tdap and DTaP, HepA and HepB).
- Keep vaccines in their original packaging.
- Store vaccines on the middle shelves and 2 to 3 inches from the walls of the combination refrigerator/freezer, not in the door or bins.
- Keep water bottles, jugs, or cold packs in the refrigerator and frozen packs or other ice-filled containers in the freezer. Mark water bottles “DO NOT DRINK.”
- Make sure you have enough space to store vaccine for the back-to-school rush and flu season.

Monitor temperatures

- Use thermometers that come with a certificate stating they have been calibrated according to national standards. Thermometers without this certificate are not acceptable.
- Check and record refrigerator and freezer temperatures twice a day, first thing in the morning and last thing at the close of business.
- Record temperature readings on a temperature log and post it in a visible location on or near the refrigerator or freezer.
- Be sure to keep temperature logs for 3 years.
- Make sure the door is shut.
- Take immediate action on all out-of-range temperatures!

Take action on out-of-range temperatures

- Determine the cause.
- Adjust the thermostat, if necessary.
- Monitor the temperature.
- If the temperature doesn’t stabilize in the correct range within 2 hours:
  - Contact the vaccine coordinator.
  - Stop using the vaccine.
  - Mark the vaccine “DO NOT USE.”
  - Move the vaccine to a refrigerator/freezer that’s maintaining the correct temperature.
  - Call for guidance right away. For MnVFC vaccine call 651-201-5522 or 800-657-3970. For private purchase vaccine, check your purchase agreement for guidance.
  - Document your actions.
Items to Post on or Near Refrigerators and Freezers

The illustration below shows essential tools that should be posted on refrigerators/freezers used to store vaccine. All are available from MDH.

Tip: Use these helpful magnets

**Keep Vaccines Safe**

- **Do Not Unplug**
  - Power cord
  - Storage unit
  - Outlets

**Warning**

- Circuit breaker/fuse box

**Vaccine Storage Temperature Log** for recording temperature readings

**Who to Call About Vaccine Storage Mishaps**

1. Stop using the vaccine.
   - Adjust thermostat.

2. Call MDH for guidance.
   - 1-800-657-3970

3. Document your actions.

If your refrigerator or freezer temperatures fall outside this range, follow these three easy steps:

- Stop using the vaccine.
- Adjust thermostat.
- Call MDH for guidance.

Refrigerator

- **35˚ — 46˚F**
- **2˚ — 8˚C**
- Aim for 40˚F (5˚C)

Freezer

- **5˚F or colder**
- **-15˚C or colder**
- Aim for 0˚F (-18˚C)

Who to Call About Vaccine Storage Mishaps

MDH Immunization Program: 1-800-657-3970

Immunization Program

P.O. Box 64975

St. Paul, MN 55164-0975

1-800-657-3970 or 651-201-5522

www.health.state.mn.us/immunize

See any patterns of problems with temperatures? Take action to keep vaccines safe!

Storage Unit

Is Vaccine Viable?

Supervisor Notified

Date & Time

Location

Temp

Problem

Action Taken

Outcome

No

Yes

No

Yes

Initials

*Tip: Use these helpful magnets*

Keep Vaccines Safe

Who to Call About Vaccine Storage Mishaps

**Vaccine Troubleshooting Log** to document actions taken if you have a storage and handling mishap.
## Guide to Receiving, Storing, and Handling Vaccines

- This guide is not a substitute for the package insert included with each vaccine.
- Visually inspect vaccines for floating particles and/or discoloration before administration.
- Keep vaccines in their original boxes to protect them from exposure to light (which can affect potency) and to help keep them organized.
- Open multi-dose vials can be used until the expiration date on the vial, unless contaminated.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Receiving</th>
<th>Storing</th>
<th>Preparing/reconstituting</th>
<th>Shelf life after opening/reconstituting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diphtheria, tetanus, pertussis (DTaP)</strong>&lt;br&gt;Daptacel, Infanrix</td>
<td>Packed with refrigerator packs in winter OR frozen packs in summer&lt;br&gt;Never frozen</td>
<td>Refrigerate immediately at 35° to 46°F (2° to 8°C).&lt;br&gt;Don’t expose to temperatures 32°F or below.</td>
<td>Shake vial well before use.&lt;br&gt;Look for floating particles; don’t use if they don’t dissolve.</td>
<td>Administer immediately after drawing up in syringe or after placing needle on pre-filled syringe.</td>
</tr>
<tr>
<td><strong>Tetanus, diphtheria (DT, Td, )</strong>&lt;br&gt;DT generic, Td generic, Decavac</td>
<td>Packed with refrigerator packs in winter OR frozen packs in summer&lt;br&gt;Never frozen</td>
<td>Refrigerate immediately at 35° to 46°F (2° to 8°C).&lt;br&gt;Don’t expose to temperatures 32°F or below.</td>
<td>Shake vial well before use.&lt;br&gt;Look for floating particles; don’t use if they don’t dissolve</td>
<td>Administer immediately after drawing up in syringe or after placing needle on pre-filled syringe. Multi-dose vials: refrigerate unused portions. May be used until expired, unless contaminated.</td>
</tr>
<tr>
<td><strong>DTaP–HepB–IPV</strong>&lt;br&gt;Pediarix</td>
<td>Packed with refrigerator packs in winter OR frozen packs in summer&lt;br&gt;Never frozen</td>
<td>Refrigerate immediately at 35° to 46°F (2° to 8°C).&lt;br&gt;Don’t expose to temperatures 32°F or below.</td>
<td>Shake vial well before use.&lt;br&gt;Look for floating particles; don’t use if they don’t dissolve</td>
<td>Administer immediately after drawing up in syringe or after placing needle on pre-filled syringe. Use until expiration date noted on vial, unless contaminated.</td>
</tr>
<tr>
<td><strong>DTaP–IPV–Hib</strong>&lt;br&gt;Pentacel</td>
<td>Packed with refrigerator packs in winter OR frozen packs in summer&lt;br&gt;Never frozen</td>
<td>Refrigerate immediately at 35° to 46°F (2° to 8°C).&lt;br&gt;Don’t expose to temperatures 32°F or below.</td>
<td>Reconstitute just before using.&lt;br&gt;Gently shake vial of liquid DTaP-IPV and withdraw entire contents.&lt;br&gt;Inject DTaP-IPV into the vial of ActHIB powder and shake well.&lt;br&gt;Withdraw entire contents, about 0.5 mL.</td>
<td>Administer immediately after withdrawal from the vial. Discard if not used within 30 minutes of reconstitution.</td>
</tr>
<tr>
<td>Vaccine</td>
<td>Arrival condition</td>
<td>Storing requirements</td>
<td>Preparing/reconstituting</td>
<td>Handling</td>
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</tr>
<tr>
<td><strong>DTaP–IPV</strong></td>
<td>• Packed with refrigerator packs in winter OR frozen packs in summer • Never frozen</td>
<td>• Refrigerate immediately at 35° to 46°F (2° to 8°C). • Don’t expose to temperatures 32° or below.</td>
<td>• Shake vial well before use. • Look for floating particles; don’t use if they don’t dissolve.</td>
<td>• Administer immediately after drawing up in syringe or after placing needle on pre-filled syringe. • Use until expiration date noted on vial, unless contaminated.</td>
</tr>
<tr>
<td><strong>Kinrix</strong></td>
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<tr>
<td><strong>Tetanus, diphtheria, pertussis (Tdap)</strong></td>
<td>• Packed with refrigerator packs in winter OR frozen packs in summer • Never frozen</td>
<td>• Refrigerate immediately at 35° to 46°F (2° to 8°C). • Don’t expose to temperatures 32° or below.</td>
<td>• Shake vial well before use. • Look for floating particles; don’t use if they don’t dissolve.</td>
<td>• Administer immediately after drawing up in syringe or after placing needle on pre-filled syringe.</td>
</tr>
<tr>
<td><strong>Adacel, Boostrix</strong></td>
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</tr>
<tr>
<td><strong>Haemophilus influenzae type b (Hib)</strong></td>
<td>• Packed with refrigerator packs in winter OR frozen packs in summer • Never frozen</td>
<td>• Refrigerate immediately at 35° to 46°F (2° to 8°C). • Don’t expose to temperatures 32° or below.</td>
<td>• Use only diluent supplied with ActHIB or Hiberix. • Reconstitute ActHIB or Hiberix just before using. • Inject the entire volume of the diluent into the vial of vaccine. • Shake well. • Withdraw entire volume of reconstituted ActHIB or 0.5 mL Hiberix.</td>
<td>• Administer immediately after drawing up in syringe. Use ActHIB and Hiberix within 24 hours of reconstitution when stored in refrigerator.</td>
</tr>
<tr>
<td><strong>ActHIB</strong></td>
<td></td>
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<tr>
<td><strong>Hiberix</strong></td>
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<tr>
<td><strong>PedvaxHIB</strong></td>
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</tr>
<tr>
<td><strong>Hepatitis A (Hep A)</strong></td>
<td>• Packed with refrigerator packs in winter OR frozen packs in summer • Never frozen</td>
<td>• Refrigerate immediately at 35° to 46°F (2° to 8°C). • Don’t expose to temperatures 32° or below.</td>
<td>• Shake vial well before use. • Look for floating particles; don’t use if they don’t dissolve.</td>
<td>• Administer immediately after drawing up in syringe or after placing needle on pre-filled syringe.</td>
</tr>
<tr>
<td><strong>Havrix, Vaqta</strong></td>
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</tr>
<tr>
<td><strong>Hepatitis B (HepB)</strong></td>
<td>• Packed with refrigerator packs in winter OR frozen packs in summer • Never frozen</td>
<td>• Refrigerate immediately at 35° to 46°F (2° to 8°C). • Don’t expose to temperatures 32° or below.</td>
<td>• Shake vial well before use. • Look for floating particles; don’t use if they don’t dissolve.</td>
<td>• Administer immediately after drawing up in syringe or after placing needle on pre-filled syringe.</td>
</tr>
<tr>
<td><strong>Engerix-B, Recombivax HB</strong></td>
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<tr>
<td><strong>HepA–HepB</strong></td>
<td>• Packed with refrigerator packs in winter OR frozen packs in summer • Never frozen</td>
<td>• Refrigerate immediately at 35° to 46°F (2° to 8°C). • Don’t expose to temperatures 32° or below.</td>
<td>• Shake vial well before use. • Look for floating particles; don’t use if they don’t dissolve.</td>
<td>• Administer immediately after drawing up in syringe or after placing needle on pre-filled syringe.</td>
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<tr>
<td><strong>Twinrix</strong></td>
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<tr>
<td><strong>Hib–HepB</strong></td>
<td>• Packed with refrigerator packs in winter OR frozen packs in summer • Never frozen</td>
<td>• Refrigerate immediately at 35° to 46°F (2° to 8°C). • Don’t expose to temperatures 32° or below.</td>
<td>• Shake vial well before use. • Look for floating particles; don’t use if they don’t dissolve.</td>
<td>• Use until expiration date noted on vial, unless contaminated.</td>
</tr>
<tr>
<td><strong>Comvax</strong></td>
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<tr>
<td>Vaccine</td>
<td>Receiving Arrival condition</td>
<td>Storing Storage requirements</td>
<td>Preparing/reconstituting</td>
<td>Handling Shelf life after opening/reconstituting</td>
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<tr>
<td>Human papillomavirus (HPV)</td>
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<tr>
<td>Cervarix, Gardasil</td>
<td>Packed with refrigerator packs in winter OR frozen packs in summer</td>
<td>Refrigerate immediately at 35º to 46ºF (2º to 8ºC).</td>
<td>Shake vial well before use.</td>
<td>Administer immediately after drawing up in syringe.</td>
</tr>
<tr>
<td></td>
<td>Never frozen</td>
<td>Don’t expose to temperatures 32ºF or below.</td>
<td>Look for floating particles; don’t use if they don’t dissolve.</td>
<td>Discard if not used by end of workday.</td>
</tr>
<tr>
<td>Polio, inactivated vaccine (IPV)</td>
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<tr>
<td>Ipol</td>
<td>Packed with refrigerator packs in winter OR frozen packs in summer</td>
<td>Refrigerate immediately at 35º to 46ºF (2º to 8ºC).</td>
<td>Shake vial well before use.</td>
<td>Administer immediately after drawing up in syringe or after placing needle on pre-filled syringe.</td>
</tr>
<tr>
<td></td>
<td>Never frozen</td>
<td>Don’t expose to temperatures 32ºF or below.</td>
<td>Look for floating particles; don’t use if they don’t dissolve.</td>
<td>Multi-dose vials: refrigerate unused portions. May be used until expired, unless contaminated.</td>
</tr>
<tr>
<td>Polio, inactivated vaccine (IPV)</td>
<td></td>
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</tr>
<tr>
<td>Ipol</td>
<td>Packed with refrigerator packs in winter OR frozen packs in summer</td>
<td>Refrigerate immediately at 35º to 46ºF (2º to 8ºC).</td>
<td>Shake vial well before use.</td>
<td>Administer immediately after withdrawing from the vial or after placing needle on pre-filled syringe.</td>
</tr>
<tr>
<td></td>
<td>Never frozen</td>
<td>Don’t expose to temperatures 32ºF or below.</td>
<td>Look for floating particles; don’t use if they don’t dissolve.</td>
<td>Multi-dose vials: refrigerate unused portions. May be used until expired, unless contaminated.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Protect Fluarix,Flulaval, Flucelvax, and Flublok from exposure to light (i.e., store in original box).</td>
<td></td>
<td>For use during current flu season; check expiration dates.</td>
</tr>
<tr>
<td>Influenza, inactivated (IIV)</td>
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<tr>
<td>Afluria, Agriflu, Fluarix, Flublok, Flucelvax, Flulaval, Fluvirin, Fluzone</td>
<td>Packed with refrigerator packs in winter OR frozen packs in summer</td>
<td>Refrigerate immediately at 35º to 46ºF (2º to 8ºC).</td>
<td>Shake vial well before use.</td>
<td>Administer immediately after removing from the refrigerator.</td>
</tr>
<tr>
<td></td>
<td>Never frozen</td>
<td>Don’t expose to temperatures 32ºF or below.</td>
<td>Look for floating particles; don’t use if they don’t dissolve.</td>
<td>For use during current flu season; check expiration dates.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Protect Fluarix,Flulaval, Flucelvax, and Flublok from exposure to light (i.e., store in original box).</td>
<td></td>
<td>Note: shelf life is 18 weeks (4½ months).</td>
</tr>
<tr>
<td>Influenza, live attenuated (LAIV)</td>
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<tr>
<td>Flumist</td>
<td>May arrive frozen or partially frozen</td>
<td>Refrigerate immediately at 35º to 46ºF (2º to 8ºC).</td>
<td>Remove the rubber tip protector from the sprayer.</td>
<td>Administer immediately after removing from the refrigerator.</td>
</tr>
<tr>
<td></td>
<td>Packed with refrigerator packs</td>
<td>Don’t store in the freezer.</td>
<td>Deliver ½ dose into one nostril.</td>
<td>For use during current flu season; check expiration dates.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Don’t expose to temperatures 32ºF or below.</td>
<td>Remove the dose-divider clip and deliver the remaining ½ dose into the other nostril.</td>
<td>Note: shelf life is 18 weeks (4½ months).</td>
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<tr>
<td>Japanese Encephalitis (JE)</td>
<td></td>
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<tr>
<td>Ixiaro</td>
<td>Packed with refrigerator packs in winter OR frozen packs in summer</td>
<td>Refrigerate immediately at 35º to 46ºF (2º to 8ºC).</td>
<td>Shake vial well before use.</td>
<td>Administer immediately after reconstitution.</td>
</tr>
<tr>
<td></td>
<td>Never frozen</td>
<td>Don’t expose to temperatures 32ºF or below.</td>
<td>Look for floating particles; don’t use if they don’t dissolve.</td>
<td>Use within 8 hours after reconstitution.</td>
</tr>
<tr>
<td>Vaccine</td>
<td>Receiving Arrangement</td>
<td>Storing Requirements</td>
<td>Handling</td>
<td></td>
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</tr>
<tr>
<td><strong>Measles, mumps, rubella (MMR)</strong></td>
<td>• Packed with refrigerator packs</td>
<td>• Refrigerate immediately at 35° to 46°F (2° to 8°C) OR freeze below 5°F (-15°C). MDH recommends storing MMR in the freezer, not the refrigerator.</td>
<td>• Reconstitute just before using. Use only the diluent supplied with the vaccine. Inject the entire volume of the diluent into the vial of vaccine and shake well. Withdraw entire contents, about 0.5 mL.</td>
<td>• Administer immediately after withdrawal from the vial. Use within 8 hours of reconstitution when stored in refrigerator and protected from light. Discard unused portions after 8 hours. Don’t freeze reconstituted vaccine. Multi-dose vials: refrigerate unused portions. May be used until expired, unless contaminated.</td>
</tr>
<tr>
<td>M-M-R II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Measles, mumps, rubella, varicella (MMRV)</strong></td>
<td>• Should arrive frozen</td>
<td>• Keep frozen below 5°F (-15°C). Once vaccine has been removed from the freezer it can be stored in the refrigerator and administered up to 72 hours, but can’t be re-frozen. Protect from exposure to light (i.e., store in original box).</td>
<td>• Reconstitute just before using. Use only the diluent supplied with the vaccine.</td>
<td>• Administer immediately after withdrawal from the vial. Mark the date and time the vial was removed from the freezer. Use within 30 minutes of reconstitution when protected from light. Don’t freeze reconstituted vaccine.</td>
</tr>
<tr>
<td>ProQuad</td>
<td></td>
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</tr>
<tr>
<td><strong>Meningococcal C/Y –Hib</strong></td>
<td>• Packed with refrigerator packs in winter OR frozen packs in summer Never frozen</td>
<td>• Refrigerate immediately at 35° to 46°F (2° to 8°C). Don’t expose to temperatures 32°or below.</td>
<td>• Reconstitute just before using. Use only the diluent supplied with the vaccine. Inject 0.7 mL of diluent into the vial of vaccine and shake well. Withdraw entire contents, about 0.5 mL.</td>
<td>• Administer immediately after reconstitution. Discard if not used within 30 minutes of reconstitution. Don’t freeze reconstituted vaccine.</td>
</tr>
<tr>
<td>Menhibrix</td>
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<tr>
<td><strong>Meningococcal conjugate (MCV)</strong></td>
<td>• Packed with refrigerator packs in winter OR frozen packs in summer Never frozen</td>
<td>• Refrigerate immediately at 35° to 46°F (2° to 8°C). Don’t expose to temperatures 32°or below.</td>
<td>• Reconstitute just before using. Use only the diluent supplied with the vaccine. Inject 0.6 mL of diluent into the vial of vaccine and gently shake well. Withdraw entire contents, about 0.5 mL.</td>
<td>• Administer immediately after withdrawal from the vial.</td>
</tr>
<tr>
<td>Menactra</td>
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<tr>
<td>Vaccine</td>
<td>Arrival condition</td>
<td>Preparing/reconstituting</td>
<td>Storing requirements</td>
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</tr>
<tr>
<td>Meningococcal conjugate (MCV)</td>
<td>Packed with refrigerator packs in winter OR frozen packs in summer</td>
<td>Reconstitute just before using. Gently shake vial of liquid MenC,Y,W-135 into the vial of MenA powder and shake well.</td>
<td>Refrigerate immediately at 35° to 46°F (2° to 8°C). Don’t expose to temperatures 32°F or below.</td>
<td></td>
</tr>
<tr>
<td>Meningococcal polysaccharide (MPSV)</td>
<td>Never frozen</td>
<td>Use only the diluent supplied with the vaccine. Inject 0.7 mL of diluent into the vial of vaccine and gently shake well.</td>
<td>Diluent: may be refrigerated or stored at room temperature, 68° to 77°F (20° to 25°C). Don’t expose to temperatures 32°F or below.</td>
<td></td>
</tr>
<tr>
<td>Pneumococcal conjugate (PCV)</td>
<td>Packed with refrigerator packs in winter OR frozen packs in summer</td>
<td>Reconstitute just before using. Use only the diluent supplied with the vaccine. Inject 0.7 mL of diluent into the vial of vaccine and gently shake well.</td>
<td>Refrigerate immediately at 35° to 46°F (2° to 8°C). Don’t expose to temperatures 32°F or below.</td>
<td></td>
</tr>
<tr>
<td>Pneumococcal polysaccharide (PPSV)</td>
<td>Never frozen</td>
<td>Reconstitute just before using. Use only the diluent supplied with the vaccine. Mix oral diluent into powder, shake, and return mixed liquid to oral applicator to administer.</td>
<td>Don’t expose to temperatures 32°F or below.</td>
<td></td>
</tr>
<tr>
<td>Rabies</td>
<td>Packed with refrigerator packs in winter OR frozen packs in summer</td>
<td>Reconstitute just before using. Use only the diluent supplied with the vaccine. Shake vial gently to suspend mixture.</td>
<td>Refrigerate immediately after withdrawal from the vial. Use within 30 minutes of reconstitution.</td>
<td></td>
</tr>
<tr>
<td>Rotavirus (RV1)</td>
<td>Never frozen</td>
<td>Reconstitute just before using. Use only the diluent supplied with the vaccine. Mix oral diluent into powder, shake, and return mixed liquid to oral applicator to administer.</td>
<td>Refrigerate immediately after withdrawal from the vial. Use within 24 hours of reconstitution when stored in the refrigerator.</td>
<td></td>
</tr>
</tbody>
</table>

**Handling**
- Administer immediately after reconstitution.
- Use within 8 hours of reconstitution.
- Discard if not used within 30 minutes of reconstitution.
- Multi-dose vials: May be reconstituted. Don’t freeze reconstituted vaccine.
- Multi-dose vials: Injectable from the vial or after placing needle on pre-filled syringe.
- May be used until expired, unless contaminated.

**Shelf life after opening/reconstituting**
- 35 days of reconstitution.
- 30 minutes of reconstitution.
- 24 hours of reconstitution when stored in the refrigerator.
<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Receiving</th>
<th>Storing</th>
<th>Handling</th>
</tr>
</thead>
</table>
| **Rotavirus (RV5)** Rotateq | • Packed with refrigerator packs in winter OR frozen packs in summer  
• Never frozen | • Refrigerate immediately at 35º to 46°F (2º to 8°C).  
• Don’t expose to temperatures 32ºF or below.  
• Protect from exposure to light (i.e., store in original box). | • Remove dosing tube from pouch, turn the cap clockwise to puncture the tube, and unscrew the cap counter-clockwise so that the liquid can be squeezed from the tube for oral administration.  
• Administer immediately after removing from the refrigerator. |
| Typhoid, inactivated Typhim Vi | • Packed with refrigerator packs in winter OR frozen packs in summer  
• Never frozen | • Refrigerate immediately at 35º to 46°F (2º to 8°C).  
• Don’t expose to temperatures 32º or below.  
• Shake vial well before use.  
• Look for floating particles; don’t use if they don’t dissolve. | • Administer immediately after withdrawal from the vial.  
• Oral capsule |
| Typhoid, oral Vivotif | • Packed with refrigerator packs in winter OR frozen packs in summer  
• Never frozen | • Refrigerate immediately at 35º to 46°F (2º to 8°C).  
• Don’t expose to temperatures 32º or below.  
• Oral capsule | |
| Varicella (VAR) Varivax | • Should arrive frozen | • Keep frozen below 5ºF (-15ºC).  
• Once vaccine has been removed from the freezer it can be stored in the refrigerator and administered up to 72 hours, but can’t be re-frozen.  
• Protect from exposure to light (i.e., store in original box).  
• **Diluent:** may be refrigerated or stored at room temperature, 68º - 77ºF (20º - 25ºC). Don’t expose to temperatures 32º or below  
• Reconstitute just before using.  
• Use only the diluent supplied with the vaccine.  
• Inject 0.7 mL of diluent into the vial of vaccine and shake well.  
• Withdraw entire contents, about 0.5 mL.  
• Administer immediately after withdrawal from the vial.  
• Mark the date and time the vial was removed from the freezer.  
• Use within 30 minutes of reconstitution when protected from light.  
• Don’t freeze reconstituted vaccine. | |
| Yellow fever YF-Vax | • Packed with refrigerator packs in winter OR frozen packs in summer  
• Never frozen | • Refrigerate immediately at 35º to 46°F (2º to 8°C).  
• **Diluent:** may be refrigerated or stored at room temperature, 68º to 77ºF (20º to 25ºC). Don’t expose to temperatures 32º or below  
• Reconstitute just before using.  
• Use only the diluent supplied with the vaccine.  
• Inject the entire volume of the diluent into the vial of vaccine and allow to sit for 2 minutes; then carefully swirl mixture.  
• Do not shake vigorously.  
• Withdraw entire contents, about 0.5 mL.  
• Administer immediately after reconstitution.  
• Use within 1 hour of reconstitution. | |
<table>
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<tr>
<th>Vaccine</th>
<th>Receiving</th>
<th>Storing</th>
<th>Handling</th>
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<tbody>
<tr>
<td><strong>Zoster (ZOS)</strong>&lt;br&gt;Zostavax</td>
<td>- Should arrive frozen</td>
<td>- Keep frozen below 5°F (-15°C).&lt;br&gt;- Once vaccine has been removed from the freezer it can be stored in the refrigerator and administered up to 72 hours, but can’t be re-frozen.&lt;br&gt;- Protect from exposure to light (i.e., store in original box).&lt;br&gt;- <strong>Diluent:</strong> may be refrigerated or stored at room temperature, 68º - 77ºF (20º - 25ºC). Don’t expose to temperatures 32ºF or below.&lt;br&gt;- Reconstitute just before using.&lt;br&gt;- Use only the diluent supplied with the vaccine.&lt;br&gt;- Inject 0.7 mL of diluent into the vial of vaccine and shake well.&lt;br&gt;- Withdraw entire contents, about 0.65 mL.&lt;br&gt;- Administer immediately after withdrawal from the vial.&lt;br&gt;- Mark the date and time the vial was removed from the freezer.&lt;br&gt;- Use within 30 minutes of reconstitution when protected from light.&lt;br&gt;- Don't freeze reconstituted vaccine.</td>
<td></td>
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</tbody>
</table>
Vaccine may need to be disposed of because it spoils (e.g., storage and handling mishap), expires, or is replaced by a newer product. Proper disposal of vaccines is everyone's responsibility to protect our environment. Before disposing of vaccine, contact the MnVFC program (for MnVFC vaccine) or the manufacturer/distributor (for privately purchased vaccine) to see if it can or should be returned.

For MnVFC vaccine:
- Call MnVFC for guidance and approval.
- Once you have MnVFC approval, return all spoiled and expired MnVFC vaccine to McKesson following the instructions on the Returning Nonviable MnVFC Vaccine form. Never return empty vials or syringes, open multi-dose vials, or syringes with needles.
- See the MnVFC Policy and Procedure Manual for more information.

For privately purchased vaccine:
- Check your purchase agreement for guidance. If there is none, call the manufacturer for guidance and ask to speak to the medical consultant or quality assurance staff. See Resources on page 217 for telephone numbers.

Disposing of vaccine in Minnesota
Sometimes vaccine cannot be returned to the distributor or manufacturer (for example, partially used multi-dose vials or private-purchase vaccines). Instead, providers are responsible for disposal. To dispose of vaccines appropriately, you need to know if they are hazardous waste, infectious waste, both hazardous and infectious waste, or neither. For more information, see Where to Dispose of Vaccine, Vials, and Syringes on page 29.

Hazardous waste
According to Minnesota Hazardous Waste Rules (Minn. R. 7045.0127, subp. 2.), vaccines containing any amount of the preservative thimerosal (which contains ethylmercury) are considered hazardous waste. Most multi-dose vials contain thimerosal and some pre-filled syringes contain trace amounts of thimerosal. So these vaccines/presentations must be disposed of in a hazardous waste container - not an infectious waste (sharps) container. However, empty thimerosal-containing vaccine vials and syringes (see definition below) are considered nonhazardous and noninfectious waste. For an up-to-date listing of vaccines that contain thimerosal, see:
- www.fda.gov/BiologicsBloodVaccines/SafetyAvailability/VaccineSafety/UCM096228
- www.vaccinesafety.edu/thi-table.htm
Disposing of Vaccine

What does "empty" mean and why does it matter?
According to Minnesota Hazardous Waste Rules, a vial or syringe containing any amount of thimerosal is only considered empty when 3% by weight or less of the original vaccine liquid remains. Practically speaking, this means:
- A vial or syringe is considered empty when there isn't any remaining liquid that can be removed from it.
- A vial or syringe that still has any liquid with any amount of thimerosal in it must be disposed of as hazardous waste.

What is a trace amount of thimerosal?
- Vaccines labeled as "preservative-free" may contain trace amounts of thimerosal that was used during manufacturing but later removed, leaving only a trace amount (about 1/100th of the amount found in vaccines that use thimerosal as a preservative). Vaccines with even trace amounts of thimerosal need to be disposed of as hazardous waste according to state rules.
- Vaccines labeled as "thimerosal-free" do not contain thimerosal and are not considered hazardous waste.

Disposing of hazardous waste
If you already work with a hazardous waste disposal company, you might want to use them to dispose of vaccine that is considered hazardous. However, it is generally less expensive to go through a Very Small Quantity Generators (VSQG) site. If you have never generated or shipped hazardous waste before, the VSQG site or hazardous waste disposal company will help with that.


Infectious waste
Infectious waste has the potential to transmit disease to humans. It is also called biohazardous, red bag, or regulated medical waste. Infectious waste disposal is not the same as hazardous waste disposal.
- All live virus vaccines (LAIV, MMR, MMRV, rotavirus, oral typhoid, varicella, yellow fever, and zoster) must be managed as infectious waste according to Minnesota Infectious Waste Rules.
- In addition, empty syringes with a used needle attached are infectious waste because they may contain infectious bodily fluids.

Nonhazardous and noninfectious (normal trash)
Nonhazardous and noninfectious waste is waste that can be disposed of in the normal trash. It is also called solid waste or industrial solid waste.
## Where to Dispose of Vaccine, Vials, and Syringes

<table>
<thead>
<tr>
<th>Vaccine waste items</th>
<th>Hazardous</th>
<th>Infectious</th>
<th>Nonhazardous &amp; noninfectious</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thimerosal-free inactivated vaccines</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Unused, spoiled, or expired</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>• Empty used vial</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>• Empty used syringe with needle attached</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>• Empty used syringe without needle attached</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Live virus vaccines (thimerosal-free)</strong></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>• Unused, spoiled, or expired</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>• Empty used vial</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>• Empty used syringe with needle attached</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>• Empty used syringe without needle attached</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>• Empty used oral applicator (rotavirus) or nasal sprayer (LAIV)</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Thimerosal-containing multi-dose vials or preservative-free single dose inactivated vaccines (which contain trace amount of thimerosal)</strong></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>• Unused, spoiled, or expired</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>• Empty* used vial</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>• Empty* used syringe with needle attached</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>• Empty* used syringe without needle attached</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

### Where to dispose

- Hazardous waste container
- Sharps container
- Normal trash

*A practical definition of "empty" is a vial or syringe with no remaining liquid you can remove from it. (See page 27 for a formal definition as it applies to Minnesota Hazardous Waste Rules.)*

Make sure to follow hazardous waste management requirements.
Refer to the Worksheet for Developing an Emergency Plan for Managing Vaccine on page 43 to develop your own site-specific plan for storing and transporting vaccines in the event of a refrigerator or freezer malfunction, power failure, natural disaster, or other emergency that might compromise appropriate vaccine storage conditions.

- Be sure your plan includes procedures for situations when you will have some lead time (e.g., when you know your office is moving) as well as those when you have no lead time (e.g., a sudden outage).
- Your plan should also identify an alternate site (e.g., a hospital or long-term care facility) that has a backup generator to store your vaccine in case of a lengthy power outage.
- If there is no hospital or long-term care facility with a backup generator in your area, contact a pharmacy or grocery store to pre-arrange vaccine storage in the event of a lengthy power outage.
- Larger clinics should consider purchasing their own backup generator.
- Go over the plan with staff each year and update it as needed.

**If your refrigerator/freezer is not working:**

1. **Call for service** immediately.
2. **Refer to your emergency plan** for managing vaccine for guidance on storing and transporting vaccines in a power outage or other emergency.
3. **Stop using the vaccine if temperatures are out of range.**
   - Mark the vaccine “DO NOT USE” so staff won’t inadvertently administer it.
   - Move the vaccine to a refrigerator/freezer that’s maintaining the correct temperature – apart from other vaccines – until you can determine if it is viable.
   - Do not throw it away!
4. **Call for guidance** right away. If the vaccine in question is from MnVFC, call the MnVFC program. For private purchase vaccine, check your purchase agreement for guidance.
   - Be ready to provide the temperature details, lot numbers, and expiration dates.
   - If you are instructed to contact the manufacturer, make sure to ask to speak to the medical consultant or quality assurance staff.
5. **Document your actions;** see Vaccine Troubleshooting Log on page 51.
General instructions for packing vaccine

1. Use hard-sided or Styrofoam coolers with at least two-inch thick walls; see Acceptable Coolers for Vaccine Transfer or Transport on page 35.
   - Don’t use thin-walled Styrofoam coolers, soft-sided coolers, or lunch bags found at grocery stores or gas stations.

2. Depending on the type of vaccine, place cold/frozen packs on the bottom of the cooler and at the sides to surround the vaccine.
   - Don’t transport refrigerated vaccines in the same cooler with frozen vaccines.
   - Don’t place vaccines directly on or next to cold/frozen packs; see Packing frozen vaccines on page 32.

3. Place a minimum of two inches of insulating barrier over the cold/frozen packs. This will help keep the vaccine from touching the packs and prevent accidental freezing and shifting during transport. Some examples of insulating barrier include:
   - Bubble wrap
   - Brown packing paper
   - Newspaper

4. Place vaccines (in their original packaging) in a plastic bag on top of the insulating barrier.

5. When transport will take more than one hour, place a calibrated thermometer on top of the vaccine, preferably one with an internal probe and external read.

6. Add another two-inch layer of insulating barrier.

7. Add another layer of cold/frozen packs.

8. Secure lid; tape if necessary.

Packing refrigerated vaccines

Refrigerated vaccines include DTaP, DT, Td, Tdap, hepatitis A and B, Hib, HPV, influenza (TIV, LAIV), IPV, meningococcal, pneumococcal, rotavirus, and combinations of these vaccines. MMR can also be packed as a refrigerated vaccine.

- Keep cold at 35° to 46°F (2° to 8°C), but do not freeze.
- Use cold or frozen packs depending on the outdoor temperature:
  - Frozen packs for temperatures of 75°F or more
  - Cold packs for temperatures of 74°F or less

Inside view of cooler for refrigerated vaccines
Packing and Transporting Vaccine

Transfer or transport of frozen vaccines (MMRV and varicella) is not permitted by the MnVFC program; call them for guidance.

**Packing frozen vaccines**

Frozen vaccines include MMRV, varicella, and zoster. Even if you pack and transport them with frozen packs, the viability of these vaccines may not be preserved. At best, their shelf life will be reduced. These vaccines are extremely fragile and should only be packed and transported when:

- You need to give one or two prescheduled doses at an off-site location.
- There is an emergency such as a weather-related disaster.
- There may be a long-term power outage (four hours or more).

**Keeping vaccine frozen between -58°F and +5°F (-50°C and -15°C):**

- Use frozen packs to pack and transport frozen vaccine because it can maintain the temperature between -58°F and +5°F.
- Do not freeze diluent; the vials may break.
- Do not use dry ice.
- Pack frozen vaccines immediately before transporting them.

**Using frozen packs:**

- Use a minimum of 6 frozen packs to surround the vaccine on all sides.
- Place vaccines (in their original packaging) in a plastic bag directly on frozen packs; you don’t need an insulating barrier.
- Place a calibrated thermometer between the vaccine and frozen packs, preferably between the vaccine boxes.
- Tape the cooler shut until you are ready to unpack the vaccine.
- Check the temperature of the cooler immediately upon arrival and:
  - If the temperature is between -58°F and +5°F (-50°C and -15°C), the vaccine is still considered frozen and can be placed in the freezer.
  - If the temperature is 5°F to 32°F (-15°C to 0°C), the vaccine is still considered frozen and can be placed in the freezer. However, because the temperature exceeded 5°F (-15°C) the expiration date may need to be adjusted. Contact the manufacturer (ask for the medical consultant or quality assurance staff) for guidance on adjusting the vaccine expiration date. Be ready to provide temperature details, transport time, lot numbers, and current expiration dates.
  - If the temperature is 33°F to 46°F (1°C to 8°C), the vaccine is no longer frozen and should be placed in the refrigerator and used within 72 hours.
  - If the temperature is 47°F (9°C) or above, place it in the refrigerator marked “DO NOT USE,” and call the MDH Immunization Program for guidance right away (651-201-5522, 1-800-657-3970). Follow the steps in the TAKE ACTION box on page 30.
  - Document your actions; see Vaccine Troubleshooting Log on page 51.

Transfer or transport of frozen vaccines (MMRV and varicella) is not permitted by the MnVFC program; call them for guidance.
**Transferring and transporting vaccine**

Whether you are transferring vaccine to another provider or transporting vaccine to an off-site clinic, follow these tips:

- Pack the vaccine correctly in an appropriate cooler; see *Acceptable Coolers for Vaccine Transfer or Transport* on page 35.
- Pack refrigerated vaccines first and frozen vaccines immediately before transporting them.
- Keep the cooler in a temperature-controlled environment (e.g., don’t put it in the trunk of a car or the back of a pick-up truck, and don’t leave it in a car on a hot summer day or a cold winter day).
- Attach labels to the outside of the cooler to clearly identify the contents as valuable and fragile.
- Clearly mark vaccine packages with the date and time they were removed from the refrigerator/freezer.
- Put a list of vaccine types, quantities, lot numbers, expiration dates, and the originating facility in the cooler.
- Open and close the cooler as little as possible.

**Transferring vaccine to another clinic or provider:**

- Hand deliver the cooler with vaccine to the vaccine coordinator at the accepting facility.
- Ensure the vaccine is immediately stored correctly, i.e., placed in the refrigerator or freezer.

**Transporting vaccine to an off-site clinic:**

- Transport only the quantity of vaccine needed.
- Don’t use home refrigerators/freezers for overnight storage of any vaccine; see *Acceptable Coolers for Vaccine Transfer or Transport* on page 35.
- Never pre-draw vaccine for transport.
- Check and record vaccine temperatures hourly if transport time is longer than one hour, preferably using a thermometer with an internal probe and external read.
Acceptable Coolers for Vaccine Transfer or Transport

It is essential to maintain proper storage temperatures while transferring vaccine to another provider/clinic or transporting vaccine to an off-site clinic. The table below may help you choose the type of cooler that fits your needs. Make sure to follow the best practices for packing and transporting vaccine to keep your vaccine safe.

A thermometer with an *internal probe and external read* is preferred over one that is placed inside the cooler and can only be read by opening the cooler.

The Minnesota Department of Health does not endorse or recommend any specific brand of cooler.

<table>
<thead>
<tr>
<th>Cooler type</th>
<th>Description</th>
<th>When and how to use</th>
<th>Monitoring temperatures off-site</th>
</tr>
</thead>
</table>
| **Compressor cooler**  | Small portable cooler that is cooled by a compressor. Can be plugged into a vehicle’s power source or into an electrical outlet | For use off-site over several days  
An option for staff traveling to several sites and staying overnight | It can be challenging to achieve and maintain the correct temperature when this type of cooler is plugged into a vehicle’s power outlet.  
Check and record temperatures several times:  
- Hourly during transport in a vehicle  
- On arrival at your home or hotel  
- One hour later  
- When you retire for the night  
- First thing in the morning  
- Hourly during clinics  
To maintain the temperature, open the cooler as little as possible. |
| **Personal cooler**     | Hard-sided cooler with a hard cover  
**Example:**  
- Igloo Playmate Cooler | For transferring vaccine to another clinic or provider (e.g., 1 hour or less)  
For same-day clinic; use within 6-8 hours after packing the vaccine  
Must be properly packed and used for no more than 6-8 hours | Check and record temperatures hourly when using the cooler for more than one hour.  
To maintain the temperature, open the cooler as little as possible. |
| **Industrial Styrofoam cooler**  | Styrofoam coolers that vaccine is delivered in from the manufacturer or distributor  
Styrofoam coolers with walls at least 2 inches thick | For transferring vaccine to another clinic or provider (e.g., 1 hour or less)  
For same-day clinic; use within 6-8 hours after packing the vaccine | Check and record temperatures hourly when using the cooler for more than 1 hour.  
To maintain the temperature, open the cooler as little as possible. |
| **Do Not Use!**         | Thermostatic cooler that can be plugged into a vehicle’s power source or into an electrical outlet  
Thin-walled Styrofoam coolers purchased at grocery stores or gas stations to hold beverages  
Soft-sided coolers or lunch bags  
These types of coolers are not adequate at any time for transporting or storing vaccines. They can’t maintain the correct temperatures. | | |
Key Resources for Managing Vaccine

For copies of the MDH materials listed here use the Immunization Materials for Professional Use order form at www.health.state.mn.us/divs/idepc/immunize/ordermat.html or you can download many of them from the web.

For Managing Vaccine

- **Monthly Vaccine Inventory Log** (MDH)
  Log for managing your vaccine inventory.
  www.health.state.mn.us/divs/idepc/immunize/hcp/vaxinv.pdf

- **Guide to Managing Out-of-Range Temperatures** (MDH)
  An algorithm to help determine next steps when discovering out-of-range temperatures, page 41

- **Worksheet for Developing an Emergency Plan for Managing Vaccine** (MDH)
  A worksheet to help you plan for managing your vaccine in case of an emergency.
  www.health.state.mn.us/divs/idepc/immunize/hcp/worksheet.pdf

- **Do Not Unplug** and **Warning** stickers (MDH)
  Stickers (pictured below) to affix to refrigerator/freezers and circuit breakers to prevent accidental unplugging.

- **Vaccine Storage Temperature Log** (MDH)
  Log to post on the refrigerator and freezer to record temperatures (Celsius or Fahrenheit).
  www.health.state.mn.us/divs/idepc/immunize/hcp/vaccine.html#storage

- **Vaccine Troubleshooting Log** (MDH)
  Log to record actions you take if a temperature is our of range or a vaccine storage and handling mishap occurs.
  www.health.state.mn.us/divs/idepc/immunize/hcp/vaxlog.pdf
# Monthly Vaccine Inventory Log

## Month and Year

Use this log to record your vaccine inventory each month and with each vaccine order to avoid over-ordering. Make sure you:

- Check vaccine expiration dates.
- Rotate your vaccine supply, placing vaccines with the earliest expiration dates in front of other vaccines and always using them first. Mark these packages “use first” to alert staff.
- If the expiration date is listed by month and year, the vaccine expires the last day of the month (e.g., “06/2012” means the vaccine will expire on June 30, 2012).

<table>
<thead>
<tr>
<th>Vaccine or diluent name</th>
<th>Vaccine manufacturer(^1)</th>
<th>Packaging type(^2)</th>
<th>Lot number</th>
<th>National Drug Code (NDC)</th>
<th>Number of doses</th>
<th>Expiration date</th>
<th>Vaccine expires in 3 months(^3)</th>
<th>MnVFC vaccine</th>
<th>Private purchase vaccine</th>
<th>Staff initials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

\(^1\)Vaccine manufacturer Code:
- CSL Biotherapies CSL
- GlaxoSmithKline SKB
- ID Biomedical IDB
- Massachusetts Biologic Labs MBL
- MedImmune, Inc. MED
- Merck & Co., Inc MSD
- Novartis NOV
- Pfizer PFR
- sanofi pasteur Inc PMC
- Wyeth Vaccines WAL

\(^2\)Packaging type Code:
- Single-dose vial SD
- Multidose vial MD
- Manufacturer-filled syringe MF
- Tubes (Rotateq) T
- Nasal sprayer (LAIV) NS

\(^3\)Vaccine expires in 3 months

If you have excess vaccine or vaccine that will expire within 3 months

1. Determine which vaccines can be used before they expire.
2. Transfer vaccines you won’t use to another clinic where they can be used before they expire.
3. If it’s MnVFC vaccine or vaccine that will expire within 3 months, call the MnVFC program at 651-201-5522 for guidance. For private purchase vaccine, check your purchase agreement for guidance.
<table>
<thead>
<tr>
<th>Vaccine or diluent name</th>
<th>Lot number</th>
<th>Packaging type</th>
<th>National Drug Code (NDC)</th>
<th>Number of doses</th>
<th>Expiration date</th>
<th>Vaccine expires in 3 months</th>
<th>MnVFC vaccine</th>
<th>Private purchase vaccine</th>
<th>Staff initials</th>
</tr>
</thead>
</table>
Guide to Managing Out-of-Range Temperatures

Out-of-range temperature discovered!

- Determine cause and follow algorithm below.
- Immediately adjust thermostat, if necessary.
- Keep refrigerator/freezer door closed as much as possible.
- Monitor temperature every 30 minutes.

If temperature has not started to correct within 30 minutes:

TAKE ACTION

✓ Contact immediately:
  - Primary and backup vaccine coordinator
  - Emergency staff and others as necessary
  - Alternate vaccine storage facility(s) if you need to move the vaccine

If temperature remains out of range after checking every 30 minutes for 2 hours:

✓ Stop using the vaccine:
  - Mark the vaccine “DO NOT USE” so staff won’t inadvertently administer it.
  - Move the vaccine to a refrigerator/freezer that’s maintaining the correct temperature – apart from other vaccines – until you can determine if it is viable. Do not throw it away!

✓ Call for guidance right away: If the vaccine in question is from MnVFC, call the MnVFC program (651-201-5522). For private purchase vaccine, check your purchase agreement.
  - Be ready to provide temperature details, lot numbers, and expiration dates.
  - If you are instructed to contact the manufacturer, make sure to ask to speak to the medical consultant or quality assurance staff.

✓ Document your actions; see Vaccine Troubleshooting Log on page 51.

---

**Flowchart Diagram**

- Power failure? (storm, flood, tornado, other)
  - Mechanical malfunction?
    - Does your facility have a backup generator?
      - Yes
        - Start backup generator.
        - Monitor temperature every 30 minutes.
      - No
        - Prepare to move vaccine according to your emergency plan for managing vaccine.
  - Prepare to move vaccine according to your emergency plan for managing vaccine.

- Temperature back in range within 60 minutes?
  - Yes
    - Prepare to move vaccine according to your emergency plan for managing vaccine.
  - No
    - Call for service immediately.

- If it will be more than 2 hours before the unit will be functioning, follow the TAKE ACTION steps above, and be ready to move vaccine, if necessary, according to your emergency plan for managing vaccine.
Worksheet for Developing an Emergency Plan for Managing Vaccine

In advance of an emergency, complete this worksheet and store it in an easily accessible area near vaccine storage unit(s).

Emergency Plan for Managing Vaccine

Checklist of essential items:

- Designated primary and backup vaccine coordinators with emergency contact information
- Emergency staff contact list in order of priority
- Vaccine storage unit specifications (type, brand, model number, serial number)
- Alternate vaccine storage facility(s)
- Written protocols and identified vehicles and drivers for transporting vaccine to and from the alternate vaccine storage facility(s)
- Written instructions for how to enter your facility and access vaccine storage units if the building is closed or it’s after hours. Include the building security after-hours access procedure, a floor diagram, and the locations of:
  - Doors
  - Flashlights
  - Spare batteries
  - Light switches
  - Keys
  - Locks
  - Alarms (including instructions for use)
  - Circuit breakers
  - Packing materials
- Written protocol for vaccine packing
- Appropriate packing materials to safely transport and/or temporarily store vaccine
- Written protocol for appropriately storing vaccine at the alternate storage facility(s)
- Up-to-date list of manufacturer quality control office phone numbers
### Vaccine Coordinators

<table>
<thead>
<tr>
<th>Name</th>
<th>Phone Numbers (home, cell)</th>
<th>Email (work, home)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backup</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Emergency Staff Contact List

<table>
<thead>
<tr>
<th>Name (list in order of priority)</th>
<th>Emergency Role (driver, vaccine packer, etc.)</th>
<th>Phone Numbers (home, cell)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>2.</td>
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<td>6.</td>
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</tr>
</tbody>
</table>

### Vaccine Storage Unit Specifications

<table>
<thead>
<tr>
<th>Type of Unit (refrigerator or freezer)</th>
<th>Brand</th>
<th>Model Number</th>
<th>Serial Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
# Emergency Resources Contact List

<table>
<thead>
<tr>
<th>Emergency Resources</th>
<th>Company Name</th>
<th>Contact Person</th>
<th>Phone Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric power company</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generator repair company</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Generator fuel source</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigeration repair company</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Local Health Department</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State Health Department Immunization Program</td>
<td></td>
<td></td>
<td>800-657-3970</td>
</tr>
<tr>
<td>State Health Department MnVFC Program</td>
<td></td>
<td></td>
<td>651-201-5522</td>
</tr>
</tbody>
</table>

# Alternate Vaccine Storage Facility(s)

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Contact Person</th>
<th>Phone Numbers</th>
<th>Storage Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

# Transportation to Alternate Vaccine Storage Facility(s)

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Contact Person</th>
<th>Phone Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refrigerated vehicle company</td>
<td></td>
<td></td>
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<tr>
<td>Refrigerated vehicle company (alternate)</td>
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<tr>
<td>Private vehicle</td>
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<td>Private vehicle (alternate)</td>
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</table>

MnVFC Program: 651-201-5522

Available on the web at: www.health.state.mn.us/divs/idepc/immunize/hcp/worksheet.pdf
<table>
<thead>
<tr>
<th>Packing Materials</th>
<th>Company Name</th>
<th>Contact Person</th>
<th>Phone Numbers</th>
</tr>
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<tbody>
<tr>
<td>Insulated containers or coolers</td>
<td></td>
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<tr>
<td>Insulated containers or coolers (alternate)</td>
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<tr>
<td>Fillers (e.g., bubble wrap, brown packing paper, newspaper)</td>
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<tr>
<td>Fillers (alternate)</td>
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</tr>
<tr>
<td>Cold / frozen packs</td>
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<td></td>
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<tr>
<td>Cold / frozen packs (alternate)</td>
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<tr>
<td>Dry ice vendor (if inventory includes MMRV, varicella, or zoster vaccine)</td>
<td></td>
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<tr>
<td>Dry ice vendor (alternate)</td>
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</tr>
<tr>
<td>Certified, calibrated thermometers</td>
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<tr>
<td>Certified, calibrated thermometers (alternate)</td>
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</table>

Based on CDC’s Emergency Vaccine Retrieval and Storage Plan Worksheet from the *Storage and Handling Toolkit*.  
www2a.cdc.gov/vaccines/ed/shtoolkit/resources/Emerg_Vac_Rtrvl_Strg_Plan_Worksheet.htm
# Vaccine Storage Temperature Log (Celsius)

**Location of Unit:** ______________________________ **Month/Year:** ____

- **Twice a day** place an “X” in the box that corresponds with the current temperature and time. If the temperature is not on the grid, write the actual temperature in the “OTHER” box; do not use an X.
- Fill in the minimum and maximum temperatures at the same time (if you have that information).
- Take immediate action on any temperature you find in the shaded area!
- If the temperature in your refrigerator/freezer is not on the grid or is in a shaded area, mark the vaccine in question and do not use it until you’ve called the Minnesota Immunization Program, 800-657-3970 or 651-201-5522.
- If the vaccine has gotten too warm or too cold, you will not be able to distinguish viable from nonviable vaccine by looking at it.
- Keep these monthly temperature logs for 3 years.

## Refrigerator - Aim for 4°C

<table>
<thead>
<tr>
<th>DAY</th>
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<th>3</th>
<th>4</th>
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<th>14</th>
<th>15</th>
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</tr>
</thead>
<tbody>
<tr>
<td>TIME</td>
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<td>pm</td>
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</table>

**Take immediate action if temperature is in shaded area**

- Adjust thermostat and call MDH for guidance.

## Freezer - Aim for -18°C

<table>
<thead>
<tr>
<th>DAY</th>
<th>1</th>
<th>2</th>
<th>3</th>
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</thead>
<tbody>
<tr>
<td>TIME</td>
<td>am</td>
<td>pm</td>
<td>am</td>
<td>pm</td>
<td>am</td>
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</tbody>
</table>

**Take immediate action if temperature is in shaded area**

- Adjust thermostat and call MDH for guidance.

---

MDH Immunization Program  
800-657-3970, 651-201-5503  
www.health.state.mn.us/immunize

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IC# 141-2232 (9/11)  
Page 1 of 2
# Vaccine Storage Temperature Log (Celsius)

Location of Unit: ______________________________ Month/Year: _____

- **Twice a day** place an “X” in the box that corresponds with the current temperature and time. If the temperature is not on the grid, write the actual temperature in the “OTHER” box; do not use an X.
- Fill in the minimum and maximum temperatures at the same time (if you have that information).
- Take immediate action on any temperature you find in the shaded area!
- If the temperature in your refrigerator/freezer is not on the grid or is in a shaded area, mark the vaccine in question and do not use it until you’ve called the Minnesota Immunization Program, 800-657-3970 or 651-201-5522.
- If the vaccine has gotten too warm or too cold, you will not be able to distinguish viable from nonviable vaccine by looking at it.
- Keep these monthly temperature logs for 3 years.

### Refrigerator - Aim for 4°C

<table>
<thead>
<tr>
<th>TIME</th>
<th>17</th>
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</tbody>
</table>

**Take immediate action if temperature is in shaded area**
Adjust thermostat and call MDH for guidance.

### Freezer - Aim for -18°C

<table>
<thead>
<tr>
<th>TIME</th>
<th>17</th>
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</tbody>
</table>
Vaccine Storage Temperature Log (Fahrenheit)

| Location of Unit: ______________________________ | Month/Year: _____ |

- **Twice a day** place an “X” in the box that corresponds with the current temperature and time. If the temperature is not on the grid, write the actual temperature in the “OTHER” box; do not use an X.
- Fill in the minimum and maximum temperatures at the same time (if you have that information).
- Take immediate action on any temperature you find in the shaded area!
- If the temperature in your refrigerator/freezer is not on the grid or is in a shaded area, mark the vaccine in question and do not use it until you’ve called the Minnesota Immunization Program, 800-657-3970 or 651-201-5522.
- If the vaccine has gotten too warm or too cold, you will not be able to distinguish viable from nonviable vaccine by looking at it.
- Keep these monthly temperature logs for 3 years.

### Refrigerator - Aim for 40°F

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<tr>
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<td>min/max</td>
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</tbody>
</table>

**Take immediate action if temperature is in shaded area**

- Adjust thermostat and call MDH for guidance.

### Freezer - Aim for 0°F

<table>
<thead>
<tr>
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<th>4</th>
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</table>

**Take immediate action if temperature is in shaded area**

- Adjust thermostat and call MDH for guidance.
**Vaccine Storage Temperature Log (Fahrenheit)**  
**Location of Unit: ______________________________ Month/Year: _____**

- **Twice a day** place an “X” in the box that corresponds with the current temperature and time. If the temperature is not on the grid, write the actual temperature in the “OTHER” box; do not use an X.
- Fill in the minimum and maximum temperatures at the same time (if you have that information).
- Take immediate action on any temperature you find in the shaded area!
- If the temperature in your refrigerator/freezer is not on the grid or is in a shaded area, mark the vaccine in question and do not use it until you’ve called the Minnesota Immunization Program, 800-657-3970 or 651-201-5522.
- If the vaccine has gotten too warm or too cold, you will not be able to distinguish viable from nonviable vaccine by looking at it.
- Keep these monthly temperature logs for 3 years.

#### Refrigerator - Aim for 40°F

<table>
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<tr>
<td>min/max</td>
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**Take immediate action if temperature is in shaded area**

Adjust thermostat and call MDH for guidance

#### Freezer - Aim for 0°F

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**Take immediate action if temperature is in shaded area**

Adjust thermostat and call MDH for guidance
### Vaccine Storage Unit Troubleshooting Log

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<th>Storage Unit Location</th>
<th>Temp</th>
<th>Problem</th>
<th>Action Taken</th>
<th>Outcome</th>
<th>Vaccine Affected</th>
<th>Supervisor Notified</th>
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See any patterns of problems with temperatures? Take action to keep vaccines safe!