

Step 3: Vaccine Handling and Storage

Now that you have ordered vaccines and supplies, read this chapter so you will know what to do when your first vaccine delivery arrives. If it helps you and your staff to remember how important proper handling and storage of vaccines is, think of the “v” in vaccines as standing for “viable.” Vaccines only work when they are viable, that is, when they are intact—undamaged and uncontaminated. Viability is similar to potency. In any case, to keep vaccines viable or potent or “good,” you must keep vaccines at the right temperature—no vaccines should become too cold or too warm. Most vaccines should never freeze, and MMR and varicella should be protected from light.

Receive vaccine shipments

Open package immediately

Always arrange for vaccine deliveries to be made only when your vaccine coordinator or backup person is on duty. Packages should be opened immediately and inspected for any damage. Packages usually come with “temperature indicators,” and these

Step-by-Step Handling and Storage Tasks

- Receive vaccine shipments
 - Open package immediately
 - Maintain the cold chain!
- Know where to put which vaccines
 - Refrigerator or freezer?
 - Monitor temperatures
- Report refrigerator power failure and other problems
- Transport vaccines properly

should be checked to make sure the vaccine has not been exposed to improper temperatures. If there are no indicators, make sure the container included appropriate insulation and dry ice, gel packs, or ice packs. Be sure that any ice packs have not completely thawed out or that dry ice is still present in the package. [Note: If the product seems to have been exposed to too-high or too-low (i.e., frozen) temperatures or something seems amiss, put the vaccine in a specially marked, segregated tray in the refrigerator or freezer (whichever is indicated according to the type of vaccine delivered). Call the source of your shipment (e.g., manufacturer, distributor, state health department) for advice on what to do next.]

In general, there are two types of vaccines: live attenuated and inactivated. Live attenuated vaccines consist of a weakened form of the virus itself. They are easily damaged or destroyed by heat and light, making it even more important that they be stored and handled with extreme care.

Inactivated vaccines can be composed of either whole viruses or bacteria, or fractions of either. Although an immune response will be elicited following the first dose, they require multiple doses to reach full immunity. Inactivated vaccines are damaged by freezing.

When your shipments arrive, check to see that the inactivated vaccines are cold but not frozen and the live virus vaccines are

**Materials
for you
to use**

- Checklist for Safe Vaccine Handling and Storage (29)
- Emergency Response Worksheet (30)
- Vaccine Handling Tips (31)
- Temperature Log for Vaccines (32–33)
- Maintaining the Cold Chain During Transport (34)
- Do Not Unplug stickers (supplied with this guide)

frozen and packed appropriately (i.e., varicella must be transported on dry ice). Check the quantities, the lot numbers, and expiration dates against the packing slip. If there are discrepancies, contact the source of the shipment (e.g., manufacturer, distributor) immediately.

Maintain the cold chain!

What's the opposite of maintaining the cold chain? Breaking it by letting vaccines get too warm! The most confusing thing is that for most vaccines (all the inactivated ones), cold means 35-46°F (2-8°C), which is basic refrigerator temperature. For the live varicella vaccine, and the live, intranasal influenza vaccine, cold means frozen (5°F or lower or -15°C or lower); however, the live MMR vaccine can be stored in either the freezer or the refrigerator. That's why it is so critical to keep each vaccine in its proper compartment. A simple sign on the refrigerator can remind you where each vaccine goes. (We've included a handy chart at the end of this section, "Vaccine Handling Tips," that you can post on your refrigerator unit to remind staff of the appropriate storage temperatures and other basics of good vaccine management.)

Note that when vaccines get too warm, you can't tell by looking or feeling if they have become nonviable. That's why it's so critical to monitor the temperatures inside your refrigerator and freezer and make sure they are within the proper range. If the temperature goes out of range, it's then critical to take proper steps to respond to the situation. Now, if your health care setting has decided to start offering only, say, hepatitis B and hepatitis A vaccinations, both inactivated, you will only need to pay attention to the instructions for refrigerated vaccines.

Know where to put which vaccines

Vaccines should always be stored in trays in the middle of the refrigerator or freezer, never in the doors. The reason for this is that items stored in the door are frequently exposed to warm temperatures when the unit is opened. Also, be sure to keep older vaccines toward the front of the shelf. When new product arrives, place the newer product behind the older product (this is called “rotating your stock”). Vaccines with the “earliest” (soonest) expiration date should always go in front and be used first. You will note that the expiration date often consists of just a month and a year: 12/04. This indicates that the vaccine can be used until the last day of December 2004, not the first. The expiration month includes the whole month. This goes for multidose vials of vaccine that have been opened, too—multidose vials that have been opened stay “good” just as long as unopened vials as long as they do not get contaminated during use. Never use a vaccine that has been contaminated or that has expired.

Refrigerator or freezer?

All vaccines except varicella and the new live intranasal influenza vaccine can safely be kept in the refrigerator within a temperature range of 35 to 46°F (2 to 8°C). In addition to not getting too warm (above 46°F), most vaccines (the inactivated ones, in particular) must never freeze. There’s just an 11-degree Fahrenheit temperature window in which they can be stored.

MMR, a live virus vaccine, can be stored either frozen or refrigerated. Once reconstituted, MMR vaccine must be used within 8 hours (and kept refrigerated) or discarded.

Varicella vaccine, and the live, intranasal influenza vaccine, must

be kept frozen at a temperature of 5°F (-15°C) or colder. Varicella vaccine can be temporarily placed in a refrigerator for up to 72 hours before use (as long as it is not reconstituted), but if it is not used within 72 hours, it must be discarded. Once stored in the refrigerator, it must not be refrozen. Varicella vaccine is indeed sensitive; once you reconstitute it for use, you only have 30 minutes in which to administer it before it loses potency and cannot be used. Varicella diluent, like others, should be stored at either refrigerator or room temperature.

Do not reconstitute vaccines until they are ready to be used. See pages 48–49 in “Step 5: Administering Vaccines” for details on reconstitution.

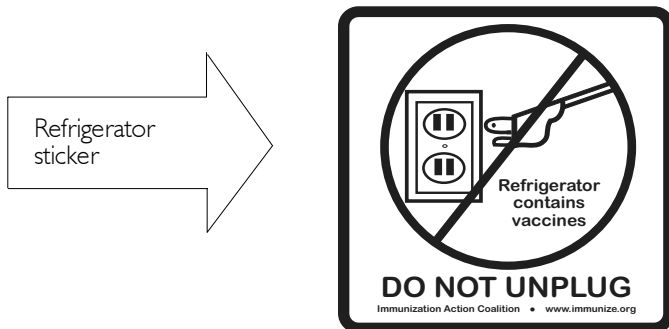
Monitor temperatures

As you will see on the IAC “Checklist for Safe Vaccine Handling and Storage” on page 29, you should take steps to maintain the proper temperatures in both refrigerator and freezer now that the right vaccines are in the right compartments. In the refrigerator, you should keep at least two or three big jugs of water. In the freezer, you should keep ice packs or ice-filled containers to help maintain the cold temperature in the event of a power outage. On a periodic basis, be sure to get in the habit of checking the gasket seals for your refrigerator and freezer units. These seals must be intact to ensure that the door always closes completely in order to keep the cold inside where it belongs.

You should also post temperature log sheets on your refrigerator, which you will find on pages 32–33. The temperature(s) of your refrigerator and freezer should be checked at least twice a day: first thing in the morning and late afternoon before closing. It’s also important to record the room (ambient) temperature at some time during the day as this may later be a factor in deter-

mining the viability of the vaccine if the power to the refrigerator is interrupted. Record the temperature(s) as indicated on the thermometer(s), and remember to do so mindfully! It's easy to get in the habit of writing without noticing, even when the temperature one has just written down is an out-of-range temperature requiring action! If you note an out-of-range temperature, consult the "Emergency Response Worksheet" on page 30.

Loss of power to the refrigerator unit can happen in a number of ways, but the one that is easiest to avoid is loss of power at the plug. Maintenance workers or others might be tempted to pull the plug from the socket to free it for other, possibly very temporary, electrical equipment use. But this has to be prevented. One of the simplest ways that physicians and nurses have found to prevent this is applying a bright "Do Not Unplug" sign right above the electrical outlet. We have enclosed two yellow stickers that people really notice. Some clinics even wrap one around the cord of the refrigerator for extra measure.



Report refrigerator power failure and other problems

Power failures happen. It's crucial that your clinic fosters a culture of openness about reporting interruptions in the power supply or other vaccine mishaps. First, it's a matter of ethics. You

don't want to be administering vaccine of questionable viability to anyone. Second, if problems are reported promptly, actions may be taken. The affected vaccines may be able to be salvaged.

What to do? If you suspect that vaccine has either been exposed to out-of-range temperatures or that vaccines have been left out of the refrigerator, mark those vaccine vials and transfer them to a functioning refrigerator as soon as possible. If the problem is a faulty refrigerator, immediately record the temperature inside the affected refrigerator and freezer to help determine the timeframe of the exposure. If the vaccines were inadvertently left out at room temperature or were left in some other improper storage condition (e.g., temperatures that are too warm or too cold), record the length of time that may have elapsed. Then contact the source of your shipment (e.g., manufacturer, distributor, state health department).

If you are told that the vaccines should not be used, mark the vials "nonviable" with a permanent black marker, right on the glass or label, and remove them from the refrigerator or freezer so that they will not be administered by mistake. Ask your state health department or manufacturer(s) where you should send the nonviable vaccine.

Transport vaccines properly

If you host an offsite vaccination clinic, or if your program operates at more than one site, you may need to transport vaccines from one place to another. Once again, the cold chain must be maintained. You will need at least one insulated container (see "Step 2: Setting Up for Vaccination Services") with a thermometer to place near the vaccine. Think of this container as your clinic's vaccine storage area in miniature: you'll need a temperature log and a pen, too, just like in the office.

If you are transporting varicella vaccine and the temperature exceeds 5°F, you must be sure you use the vaccine within 72 hours. Consult with your local health department for more detailed instructions or refer to the chart, “Maintaining the Cold Chain During Transport”, on page 34.

And remember to use a temperature log for the insulated container. When transporting vaccine, closely monitoring the cold chain is the best way to maintain it.

This chapter has covered the very basic steps involved in vaccine handling and storage for adult vaccines. We recommend that you post all of the charts that you will find on pages 31–34 near or on your refrigerator that will contain the vaccine. In addition, to build on and reinforce the information contained in this chapter, gather round the staff VCR and watch the vaccine handling and storage video that we have enclosed with this guide. Soon all you will need to start vaccinating are properly screened patients.

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Checklist for Safe Vaccine Handling and Storage

Here are the 20 most important things you can do to safeguard your vaccine supply. Are you doing them all? Reviewing this list can help you improve your clinic's vaccine management practices.

- | Yes | No | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. We have a designated person in charge of the handling and storage of our vaccines. |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. We have a back-up person in charge of the handling and storage of our vaccines. |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. A vaccine inventory log is maintained that documents: <ul style="list-style-type: none"> <input type="checkbox"/> Vaccine name and number of doses received <input type="checkbox"/> Date the vaccine was received <input type="checkbox"/> Arrival condition of vaccine <input type="checkbox"/> Vaccine manufacturer and lot number <input type="checkbox"/> Vaccine expiration date |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Our refrigerator for vaccines is either household-style or commercial-style, NOT dormitory-style. The freezer compartment has a separate door. |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. We do NOT store any food or drink in the refrigerator or freezer. |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. We store vaccines in the middle of the refrigerator or freezer, and NOT in the door. |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. We stock and rotate our vaccine supply so that the newest vaccine of each type (with the longest expiration date) is placed behind the vaccine with the shortest expiration date. |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. We check vaccine expiration dates and we first use those that will expire soonest. |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. We post a sign on the refrigerator door showing which vaccines should be stored in the refrigerator and which should be stored in the freezer. |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. We always keep a thermometer in the refrigerator. |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. The temperature in the refrigerator is maintained at 35–46°F (2–8°C). |
| <input type="checkbox"/> | <input type="checkbox"/> | 12. We keep extra containers of water in the refrigerator to help maintain cold temperatures. |
| <input type="checkbox"/> | <input type="checkbox"/> | 13. We always keep a thermometer in the freezer. |
| <input type="checkbox"/> | <input type="checkbox"/> | 14. The temperature in the freezer is maintained at +5°F (-15°C) or colder. |
| <input type="checkbox"/> | <input type="checkbox"/> | 15. We keep ice packs and other ice-filled containers in the freezer to help maintain cold temperatures. |
| <input type="checkbox"/> | <input type="checkbox"/> | 16. We post a temperature log on the refrigerator door on which we record the refrigerator and freezer temperatures twice a day—first thing in the morning and at clinic closing time—and we know whom to call if the temperature goes out of range. |
| <input type="checkbox"/> | <input type="checkbox"/> | 17. We have a “Do Not Unplug” sign next to the refrigerator’s electrical outlet. |
| <input type="checkbox"/> | <input type="checkbox"/> | 18. In the event of a refrigerator failure, we take the following steps: <ul style="list-style-type: none"> <input type="checkbox"/> We assure that the vaccines are placed in a location with adequate refrigeration. <input type="checkbox"/> We mark exposed vaccines and separate them from undamaged vaccines. <input type="checkbox"/> We note the refrigerator or freezer temperature and contact the manufacturer or state health department to determine how to handle the affected vaccines. <input type="checkbox"/> We follow the manufacturer’s or health department’s instructions as to whether the affected vaccines can be used, and, if so, we mark the vials with the revised expiration date provided by the manufacturer or health department. |
| <input type="checkbox"/> | <input type="checkbox"/> | 19. We have obtained a detailed written policy for general and emergency vaccine management from our local or state health department. |
| <input type="checkbox"/> | <input type="checkbox"/> | 20. If all above answers are “yes,” we are patting ourselves on the back. If not, we have assigned someone to implement needed changes! |

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Emergency Response Worksheet

What to do in case of a power failure or another event that results in vaccine storage outside of the recommended temperature range

Follow these procedures:

1. Close the door tightly and/or plug in the refrigerator/freezer.
2. Store the vaccines at appropriate temperatures. Make sure the refrigerator/freezer is working properly or move the vaccines to a unit that is. Do not discard the affected vaccines. Mark the vaccines so that the potentially compromised vaccines can be easily identified.
3. Call the manufacturer(s) and notify the local or state health department (see phone numbers below).
4. Record action taken.

Record this information*:

1. Current temperature of refrigerator: maximum _____ minimum _____
2. Current temperature of freezer: maximum _____ minimum _____
3. Air temperature of room where refrigerator is located: _____
4. Estimated amount of time the unit's temperature was outside normal range:
refrigerator _____ freezer _____
5. Vaccines in the refrigerator/freezer during the event (use the table below)

* Using a recording thermometer is the most effective method of tracking the refrigerator and freezer temperatures over time. Visually checking thermometers twice a day is another effective method to identify inconsistent or fluctuating temperatures in a refrigerator and freezer.

Vaccines Stored in Refrigerator

Vaccine, manufacturer, and lot #	Expiration date	# of doses	# of affected vials	Action taken

Vaccines Stored in Freezer

Vaccine, manufacturer, and lot #	Expiration date	# of doses	# of affected vials	Action taken

Other Conditions

1. Prior to this event, was the vaccine exposed to temperatures outside the recommended range? Y N
2. Were water bottles in the refrigerator and ice packs in the freezer at the time of this event? Y N
3. Other: _____

Manufacturers

- Aventis Pasteur Inc. (800) 822-2463
- Chiron Vaccines USA (800) 244-7668
- GlaxoSmithKline (888) 825-5249
- Merck & Co., Inc. (800) 672-6372
- Wyeth Vaccines (800) 358-7443

Other Resources

Local health department phone number _____ State health department phone number _____

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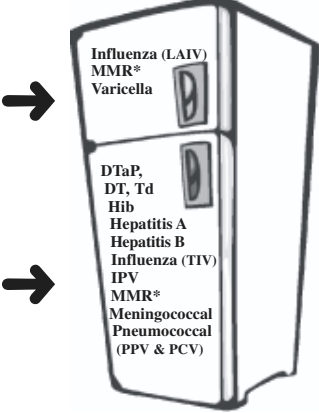
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Vaccine Handling Tips
Outdated or improperly stored vaccines won't protect patients!

Maintain freezer temperature at 5°F (-15°C) or colder

Maintain refrigerator temperature at 35–46°F (2–8°C)



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

Store vaccine correctly.[†]
Refrigerate or freeze immediately upon receiving shipment. Do not store vaccine in the door of the refrigerator or freezer. Inactivated vaccines should always be placed in the middle of the refrigerator far enough away from the freezer compartment to protect them from freezing.

Always use the vaccine with the earliest expiration date first.
Move vaccine with the earliest expiration date to the front and mark it to be used first. Keep vials in their boxes. Never use outdated vaccine.

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

Safeguard the electrical supply to the refrigerator.
Make sure the refrigerator is plugged into an outlet in a protected area where it cannot be disconnected accidentally. Label the refrigerator, electrical outlets, fuses, and circuit breakers on the power circuit with information that clearly identifies the perishable nature of vaccines and the immediate steps to be taken in case of interruption of power (use DO NOT UNPLUG stickers). If your building has auxiliary power, use the outlet supplied by that system.

*MMR may be stored in either the freezer or the refrigerator.
[†]Refer to package insert for specific instructions on the storage of each vaccine. If you have questions about the condition of the vaccine, you should immediately place the vaccine in recommended storage and call the vaccine manufacturer(s) to determine whether the potency of the vaccine(s) has been affected. For other questions, call the immunization program at your state or local health department.

Record your health department's phone number here: _____

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Temperature Log for Vaccines (Fahrenheit)

Month/Year: _____ **Days 1–15**

Instructions: Place an "X" in the box that corresponds with the temperature. The hatched zones represent unacceptable temperature ranges. If the temperature recorded is in the hatched zone: 1. **Store the vaccine** under proper conditions as quickly as possible, 2. **Call the vaccine manufacturer(s)** to determine whether the potency of the vaccine(s) has been affected, 3. **Call the immunization program at your local health department** for further assistance: (_____) and 4. **Document the action taken** on the reverse side of this log.

Day of Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Exact Time															
"F" Temp	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm
≥49°															
48°															
47°															
46°															
45°															
44°															
43°															
42°															
41°															
40°															
39°															
38°															
37°															
36°															
35°															
34°															
33°															
32°															
31°															
30°															
29°															
≤28°															
≥8°															
7°															
6°															
5°															
4°															
≤3°															
Room temp															
Freezer temp															
Staff Initials															

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Temperature Log for Vaccines (Fahrenheit)

Month/Year: _____

Days 16-31

Days 16-31

Instructions: Place an "X" in the box that corresponds with the temperature. The hatched zones represent unacceptable temperature ranges. If the temperature recorded is in the hatched zone: 1. **Store the vaccine** under proper conditions as quickly as possible. 2. **Call the vaccine manufacturer(s)** to determine whether the potency of the vaccine(s) has been affected. 3. **Call the immunization program at your local health department** for further assistance: (_____) _____ and 4. **Document the action taken** on the reverse side of this log.

Day of Month	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Exact Time	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm	am pm
"F" Temp	≥49°	≥49°	≥49°	≥49°	≥49°	≥49°	≥49°	≥49°	≥49°	≥49°	≥49°	≥49°	≥49°	≥49°	≥49°	≥49°
	48°	48°	48°	48°	48°	48°	48°	48°	48°	48°	48°	48°	48°	48°	48°	48°
	47°	47°	47°	47°	47°	47°	47°	47°	47°	47°	47°	47°	47°	47°	47°	47°
	46°	46°	46°	46°	46°	46°	46°	46°	46°	46°	46°	46°	46°	46°	46°	46°
	45°	45°	45°	45°	45°	45°	45°	45°	45°	45°	45°	45°	45°	45°	45°	45°
	44°	44°	44°	44°	44°	44°	44°	44°	44°	44°	44°	44°	44°	44°	44°	44°
	43°	43°	43°	43°	43°	43°	43°	43°	43°	43°	43°	43°	43°	43°	43°	43°
	42°	42°	42°	42°	42°	42°	42°	42°	42°	42°	42°	42°	42°	42°	42°	42°
	41°	41°	41°	41°	41°	41°	41°	41°	41°	41°	41°	41°	41°	41°	41°	41°
	40°	40°	40°	40°	40°	40°	40°	40°	40°	40°	40°	40°	40°	40°	40°	40°
	39°	39°	39°	39°	39°	39°	39°	39°	39°	39°	39°	39°	39°	39°	39°	39°
	38°	38°	38°	38°	38°	38°	38°	38°	38°	38°	38°	38°	38°	38°	38°	38°
	37°	37°	37°	37°	37°	37°	37°	37°	37°	37°	37°	37°	37°	37°	37°	37°
	36°	36°	36°	36°	36°	36°	36°	36°	36°	36°	36°	36°	36°	36°	36°	36°
	35°	35°	35°	35°	35°	35°	35°	35°	35°	35°	35°	35°	35°	35°	35°	35°
	34°	34°	34°	34°	34°	34°	34°	34°	34°	34°	34°	34°	34°	34°	34°	34°
	33°	33°	33°	33°	33°	33°	33°	33°	33°	33°	33°	33°	33°	33°	33°	33°
	32°	32°	32°	32°	32°	32°	32°	32°	32°	32°	32°	32°	32°	32°	32°	32°
	31°	31°	31°	31°	31°	31°	31°	31°	31°	31°	31°	31°	31°	31°	31°	31°
	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°
	29°	29°	29°	29°	29°	29°	29°	29°	29°	29°	29°	29°	29°	29°	29°	29°
	≤28°	≤28°	≤28°	≤28°	≤28°	≤28°	≤28°	≤28°	≤28°	≤28°	≤28°	≤28°	≤28°	≤28°	≤28°	≤28°
	≥8°	≥8°	≥8°	≥8°	≥8°	≥8°	≥8°	≥8°	≥8°	≥8°	≥8°	≥8°	≥8°	≥8°	≥8°	≥8°
	7°	7°	7°	7°	7°	7°	7°	7°	7°	7°	7°	7°	7°	7°	7°	7°
	6°	6°	6°	6°	6°	6°	6°	6°	6°	6°	6°	6°	6°	6°	6°	6°
	5°	5°	5°	5°	5°	5°	5°	5°	5°	5°	5°	5°	5°	5°	5°	5°
	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°
	≤3°	≤3°	≤3°	≤3°	≤3°	≤3°	≤3°	≤3°	≤3°	≤3°	≤3°	≤3°	≤3°	≤3°	≤3°	≤3°
Room temp																
Staff Initials																

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Maintaining the Cold Chain During Transport

When transporting vaccines, think about how each vaccine was packed when you first received it from the manufacturer or distributor. Use this as a model for how you repack the individual vaccines in order to transport them at their appropriate temperature.

- Use an insulated container; include a thermometer along with the vaccines.
- Keep a temperature log. Record the temperature during transport and periodically during the entire time the vaccine is kept in the insulated container to ensure it remains within the recommended range.

	Vaccines	Special Instructions
Inactivated vaccines	<ul style="list-style-type: none"> • Tetanus-diphtheria (Td) • Hepatitis A • Hepatitis B • Influenza, inactivated* • Pneumococcal • Meningococcal • Combination products of these vaccines 	<ul style="list-style-type: none"> • Keep cold at 35–46°F (2–8°C) and do not freeze. • Use refrigerated or frozen packs depending on the time of the year and the situation (e.g., frozen packs for hot weather while transporting outdoors, refrigerated packs for cold weather). • During transport, never let inactivated vaccine vials directly touch ice packs. Make sure vaccines are kept in their original boxes. Put some crushed paper between the boxes to keep the vaccines from shifting during transport. • During hot weather, keep the insulated container in a cool place (air-conditioned interior of car). Do not leave the vaccine container unattended or in the trunk of a parked car. During cold weather, do not leave the container in an unheated area because vaccine must not freeze. In cold weather, include a freeze indicator in the vaccine container.
Live virus vaccines	<p>Measles, mumps, rubella (MMR)</p>	<ul style="list-style-type: none"> • Keep cold at all times, 35–46°F (2–8°C) or colder. May use frozen packs. • If you are transporting diluent in the same cooler with the MMR, refrigerate the diluent in advance to help maintain the cold temperature in the cooler.
	<p>Varicella</p> <p>It is impossible to maintain varicella vaccine at 5°F (-15°C) or colder when transporting it off-site unless you use dry ice or a special freezer unit. If vaccine must be transported, follow the instructions to the right.</p>	<p>Transport only the quantity needed; clearly mark the vaccine with the date and time it was removed from the original freezer unit. It is extremely important to include a thermometer in the container with the vaccine. If dry ice is available, pack the container with enough dry ice to ensure the temperature is maintained at 5°F (-15°C) or colder. If dry ice is not available, transport the vaccine on frozen packs. If the temperature within the container exceeds 5°F (-15°C) but doesn't go above 46°F (8°C), the expiration date of the vaccine is reduced to 72 hours. Vaccine that has reached temperatures above 46°F (8°C) or has exceeded the 72-hour limit cannot be used.</p>

*For information on transporting live, attenuated intranasal influenza vaccine (FluMist), refer to the package insert.

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