NORTH DAKOTA
DEPARTMENT *of* HEALTH

DIVISION OF DISEASE CONTROL
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MEMO

TO: Prevention Partnership Providers and Local Public Health Units

FROM: Rahel Gemmeda, MS RG
Quality Assurance Coordinator

RE: Vaccine Storage and Handling Documents

DATE: August 27, 2013

The North Dakota Department of Health (NDDoH) Immunization Program has prepared vaccine storage and handling documents to help providers improve their vaccine storage and handling practices. The documents include:

- Vaccine Transport Guidance General Recommendations
- Refrigerator/Freezer Purchasing Guide
- Thermometer Guide for Prevention Partnership Providers (updated)
- Fahrenheit (ºF) Temperature Log for Refrigerator
- Celsius (ºC) Temperature Log for Refrigerator
- Fahrenheit (ºF) Temperature Log for Freezer
- Celsius (ºC)Temperature Log for Freezer
- Best Practices for Vaccine Storage and Handling (setting refrigerator and freezer)
- Vaccine Storage Troubleshooting Guide

The documents are available at www.ndhealth.gov/Immunize/Providers/Forms.htm under the vaccine storage and handling icon. We encourage you to use the documents as they are prepared based on Vaccine for Children (VFC) program and Centers for Disease Control and Prevention (CDC) vaccine storage and handling guidelines.

If your thermometer has minimum and maximum readings, please add the information to the new temperature log. Also, please notice the new fax number (701.328.0355) to fax your monthly temperature logs to the NDDoH.

If you have any questions or concerns, please contact the NDDoH Immunization Program at 701.328.3386 or toll-free at 800.472.2180.

Vaccine Transport Guidance

NORTH DAKOTA DEPARTMENT of HEALTH

General Recommendations

The vaccine cold chain should be maintained at all times during vaccine storage and transport. Due to the risk of temperature excursion associated with vaccine transport, the number of times vaccines are transported should be kept to a minimum.

Refrigerated vaccines should be transported at 2°C to 8 °C (35°F to 46°F).
Frozen vaccines should be transported at -15°C to -50°C (+5°F to - 58°F).

CDC recommends the use of portable refrigerators and freezers for vaccine transport.

The transport containers listed have a specific guide on how to pack vaccines. Providers must refer to the specific guide provided by the manufacturer.

Dry ice should not be used for transportation of varicella-containing vaccines.

Containers

CDC recommends the use of portable refrigerators and freezers for vaccine transport. In the absence of portable refrigerators, other containers can be used. See the table below for details. The equipment used for vaccine transport should maintain the required temperature during vaccine transport.

Note the following products are used for transport of refrigerated vaccines only.

Product	Volume in Liters	Holding time	Tempera-ture range	Price	Website
AcuTemp	1 L	22 hours	2 - 8°C	~$334 (with VXS1	www.acutemp.com/products/
BP 2620	3 L	120 hours	2 - 8°C	$935 for purchase $47/ month for lease	www.pelican.com/biopharma/specs.php
PX3L and PX6L	3 & 6 L	12 hours	2 - 8°C	$235	www.csafellc.com/lp/Courier1/index_PX3L.html
GTS 77	10.7 L	48 hours	2 - 8°C	$122	www.coldchaintech.com/products/kooltemp-pre-qualified-solutions/item/gts-
Series 4 248	2 L	48 hours	2 - 8°C	$265	www.mnthermalscience.com/products/series-4-248-emt
GTS18	2.2 L	24 hours	2 - 8°C	$356	www.coldchaintech.com/products/kooltemp-pre-qualified-solutions/item/gts-18/
Nomadic	2.1 L	24 hours	2 - 8°C	$65	www. /store.thermosafe.com/model/E24AUPS.html

The North Dakota Department of Health does not recommend or endorse products or manufacturers. Providers may purchase containers that are not manufactured by companies on the list. However, it is important to ensure that any refrigerator/freezer you purchase meets the health department's standards for vaccine storage.

Transportation of frozen vaccines

Vaccine manufacturers do not recommend transportation of varicella containing vaccines. If the vaccines must be transported, a portable freezer must be used.

Do not transport diluents at freezer temperature.

The North Dakota Immunization Program requires providers to use a certified, calibrated thermometer during vaccine transport.

Do not store vaccines in transport containers.

Do not ship vaccines.

Vaccines should be attended at all time during transport.

If a vaccine is exposed to out-of-range temperature during transport, label the vaccine "Do Not Use" and contact vaccine manufacturers for further guidance.

If you have questions, please contact the ND Immunization Program at: 701.328.3386 or toll-free at 800.472.2180.

Transportation of diluents

Diluents should be transported with their corresponding vaccines. Diluents that do not contain antigens (diluents for MMR, varicella and zoster) can be transported at room temperature or refrigeration temperature. Diluents for ActHIB, MPSV4, MCV4, and Pentacel as well as other diluents that contain antigens must be transported at refrigerator temperature. Diluent for rotavirus (Rotarix) must be transported at room temperature.

Thermometers

Vaccine temperatures should be monitored at all times during vaccine transport. Data loggers with a probe in glycol are preferred for vaccine transport, as they measure vial temperature and provide detailed information on temperature during transport. Regardless of the type of thermometer used, the temperature of the vaccine should be documented at least every 30 minutes during transport.

Tips for vaccine transport

- Pack vaccines with their original package. Do not remove vaccine vials from their boxes.
- Record the vaccine type, amount and the time of packaging before transport.
- Make sure that staff participating in vaccine transport are aware of the vaccine cold chain and its importance.
- Vaccine transportation containers should be labeled by appropriate labels such as "fragile" or "refrigerated material."
- Never transport a multidose vial that is opened.
- Coolant packs should be conditioned before use by leaving them at room temperature for one to two hours until the edges have defrosted and the packs look like they are sweating.
- When you transport vaccines, be sure to place an insulating barrier (bubble wrap, crumpled brown packaging paper, styrofoam peanuts) between vaccines and conditioned coolant packs to prevent accidental freezing of vaccines.
- Vaccine should not be placed in the trunk of a vehicle. It should be placed in the passenger compartment.
- When you transport vaccines, make sure the immunization staff at the designated location is available to receive and store the vaccines.
- Vaccine should be delivered directly to the receiving facility and upon arrival it should be unpacked and stored at the appropriate temperature (2 to 8°C).

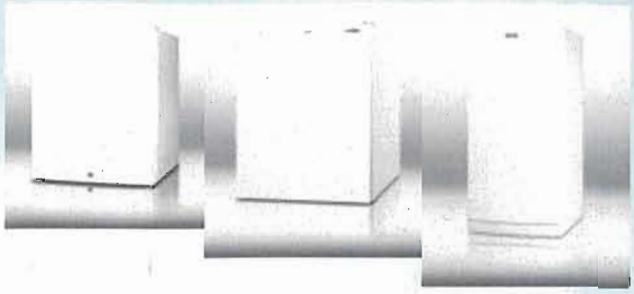
Vaccine transfer

The Immunization Program encourages providers to transfer vaccines when they have a state supplied vaccine which they do not anticipate administering before the expiration date.

For further guidance on transportation of vaccines, refer to the Vaccine Storage and Handling Toolkit available at: www.cdc.gov/vaccines/recs/storage/toolkit/storage-handling-toolkit.pdf.

NORTH DAKOTA
DEPARTMENT *of* HEALTH

Refrigerator/Freezer Purchasing Guide



When you plan to purchase a refrigerator or freezer unit,
Please take these factors in to consideration:

1. The ability to maintain temperature

- Vaccine storage refrigerator or freezer units should be able to maintain the required temperatures throughout the year. CDC recommends the use of stand-alone units (units that only refrigerate or freeze), as they maintain the required temperature effectively. CDC does not recommend the use of the freezer portion of combination units as they are not capable of maintaining the required temperatures. Most pharmacy-grade units are excellent at maintaining temperatures.
- **Dormitory style refrigerators must not be used for vaccine storage.**

2. Size of the unit

- Vaccine storage units should be large enough to hold the year's largest inventory (such as the inventory during influenza season) without crowding vaccines.
- Vaccine storage units should have enough space to hold water bottles for refrigerators and frozen packs for freezers. Water bottles and coolant packs help to stabilize temperatures in emergency situations like a power outage.

3. Estimate the size based on doses administered

Doses administered per year (Use NDIIS to obtain the data)	**Recommended equipment (See the next pages)**
Very high volume providers (10,000 doses/year)	Pharmacy-grade or biologic-grade refrigerator-only units and stand-alone freezer units.
High volume providers (2,000-10,000 doses/year)	Refrigerator-only (16.7 cubic feet minimum) and stand-alone freezer units.
Medium volume providers (500-2,000 doses/year)	Refrigerator-only (16.7 cubic feet minimum) and stand-alone freezer units or
Low volume providers (less than 500 doses/year)	Pharmacy-grade or biologic-grade under the counter units.

4. Refrigerators or freezers with built-in thermometer

- Some refrigerator/freezer units have built-in thermometers. Some manufacturers place the built-in thermometer close to the wall of the unit, which contradicts the current recommendation that says thermometers should be placed at the center, close to the vaccines. If providers wish to buy a unit with a built-in thermometer, they should check for the placement of the glycol vial and whether the thermometer is calibrated or not. Providers should check the cost of recalibration with the manufacturers and they should recalibrate the built-in thermometers regularly according to the manufacturer's recommendation. Providers must keep the certificates of calibration.

5. Defrost cycle of the unit

- CDC recommends the use of refrigerators/freezers with an automatic defrost cycle or that are frost-free for vaccine storage. Units with manual defrost cycle may need a backup refrigerator/ freezer when they are defrosted and accumulation of ice in a unit with manual defrost cycle may affect the performance of the unit. Therefore, units with manual defrost cycle are not preferred for vaccine storage.

6. The door of the unit

- There is no specific recommendation on the type of refrigerator/freezer door. However, there are some qualities to look for. Some units have doors that close automatically with an alarm to detect if the door is ajar. Some units have locks and backup generator. A National Institute of Standards and Technology's (NIST) study showed that refrigerators with a glass door have an increased risk of temperature excursion during power failure.

After buying a new refrigerator or freezer unit, allow one week of twice daily temperature recordings, including minimum and maximum temperatures, to make sure the unit maintains the required temperature before storing vaccines in the unit .

Easy Steps to Purchase a Refrigerator or Freezer

Step 1. Estimate the maximum number of doses that will be stored in the unit
Step 2. Match the maximum doses with the minimum cubic feet needed
Step 3. Search for product name and model number for prices or use the provided table.

Refrigerators

Add the number of doses on hand

VFC vaccine _____
VFC flu vaccine +_____
Private vaccine +_____
Private flu vaccine +_____
Total doses _____
Multiply by x1.25
Maximum doses = _____

Freezers

Add the number of doses on hand

VFC MMR, MMRV and Varicella _____
Private MMR, MMRV and Varicella +_____
Total doses _____
Multiply by x1.25
Maximum doses = _____

Refrigerators		
Maximum Doses	**Minimum Cubic Ft.**	**Examples of Refrigerator-only units**
2,000+ doses	May need more than one refrigerator	See below
1000 – 2000	40 cu. ft.	Revco REL-4504A; REL-4504D* Nor-Lake NSPR482* Sanyo SPR-49GD-MED*
900 – 1000	36 cu. ft.	Sanyo MPR-1013; MPR-1013R* Turbo Air GST-40DR*
801 - 900	21 - 23 cu. ft.	Aegis Scientific 1-R-22* Sanyo SRR-23FD; SRR-23GD; SRR-23FD*
701 - 800	17 - 20 cu. ft.	Aegis Scientific 3-CR-17*; Frigidaire FCGM201RF; FCRS201RFB Marvel Scientific 17CAR
400 – 700	16.7 cu. ft.	Avanti BCAD680; Nor-Lake LR161WWW/0*; Kenmore 6072; Frigidaire FRU17B2J; FRU17B2JW*
100 - 399	4.9 - 6.1 cu. ft. (must be pharmacy grade)	Sanyo SR-L4110W; SF-L6111W; MPR-214F* Nor-Lake LRO61WWW/0; NSLR051WMW/0*grade) Revco REL-404A*
Freezers		
Maximum Doses	**Minimum Cubic ft.**	**Examples of freezer-only units**
501 – 6,000	7 - 14.8 cu. ft.	Whirlpool EH150FXR; EH151FXRQ Frigidaire AFFC1466DW; Arctic Air CF07
201 - 500	5 - 5.6 cu. ft.	Revco ULT-430A* Frigidaire FFC0522DW
0 - 200	3.5 - 4.9 cu. ft	Nor-Lake LF041WWW/OM*; Revco ULT-430A* Barnstead International Model3752

Source: California Department of Public Health, VFC program

* Indicates pharmacy grade

Please contact the North Dakota Immunization Program at 701.328.3386 or 800.472.2180 with any questions. www.ndhealth.gov/Immunize/

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Some Refrigerator/ Freezers and their Specifications

Refrigerator or freezer	Manufacturer	Temperature range	Size in Cubic feet	Price	Defrost cycle	Door	website
SR-L6111W	SANYO	1°C to 14°C	6.1	$1322	Automatic	Solid door	www.us.sanyo.com/Biomedical-Preservation-Undercounter-Refrigerators-Freezers/SR-L6111W
FRGL404A	Thermo scientific	1°C to 8°C	4.9	$4873	Automatic	Solid and self-closing	www.thermoscientific.com/ecomm/servlet/productsdetail?productId=12769394&groupType=PRODUCT&sea
LR161WWW/0	Nor-Lake scientific	4°C	16.7	$1,802	Automatic	Solid/ Self closing	www.norlake.com/docs/default-source/specfication-sheets/general-purpose-laboratory-refrigerator-upright-auto-defrost-specification-sheet-%28139512%29.pdf
DH4-23SD	SO-LOW	2°C to 8°C	23	$3,510	Automatic	Solid door	www.so-low.com/lab-pharmacy-refrigerators/Soid_Door_Laboratory_and_Pharmacy_Refrigerators
LS27SD/CT	Powers Scientific Inc.	2°C to 8°C	6.5	$4,950	Automatic	Solid door optional	www.powersscientific.com/2-8c-constant-temperature-refrigerators-vaccine-storage/
iPR125	Helmer Scientific	2°C to 10°C	25	$5,333	Automatic	Solid door/ optional	www.helmerinc.com/ipr125-pharmacy-refrigerator-us-canada.aspx
iPR111	Helmer Scientific	2°C to 10°C	11.5	$4,053	Automatic	Solid door/ optional	www.helmerinc.com/ipr111-pharmacy-refrigerator-us-canada.aspx
iLF104 Freezer	Helmer Scientific	-15°C to -30°C	4	$3,651	Automatic	Self closing	www.helmerinc.com/ilf104-ada-laboratory-freezer-us-canada.aspx

You store expensive vaccines worth thousands of dollars in the refrigerator or freezer unit you buy. Therefore, you have to be strict when you choose your storage unit. For instance, 10 doses of MMRV and 10 doses of HPV vaccines cost $2,790 more than the price of some refrigerator units.

Notice: This table provides a list of refrigerators/freezers which can be considered as options when providers plan to purchase a refrigerator and/or freezer for vaccine storage. The information in this document may change over time and does not include all products or manufacturers. Therefore, providers should conduct a detailed search when they plan to purchase a refrigerator/freezer. The North Dakota Department of Health does not recommend or endorse products or manufacturers. This list is a courtesy. Providers may purchase refrigerators and freezers not manufactured by companies on this list. This guide does not differentiate between pharmaceutical and commercial grades.

NORTH DAKOTA
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Thermometer Guide for Prevention Partnership Providers

All prevention partnership providers are required to use a calibrated thermometer with certificate of traceability and calibration testing. In addition to this requirement, the Centers for Disease Control and Prevention recommends the use of a digital thermometer with detachable probe that is kept in a glycol-filled bottle. The glycol encased probe is preferred as it measures a liquid temperature which approximates the vaccine temperature in the refrigerator/freezer. Other recommendations for thermometers include the following specifications:

- Alarm system for out-of-range temperatures
- Current, minimum and maximum temperature records
- Reset button
- Low battery indicator
- A thermometer which can provide continuous data monitoring information with user programmable recording interval
- Memory of at least 4,000 recordings
- A thermometer display which can be placed outside the refrigerator/freezer to ease reading
- The calibration report of a thermometer tells the level of accuracy of the thermometer against reference standard. A thermometer with levels of accuracy of +/- 1°F/+/-.5°C is recommended.

Certificates of calibration should fulfill either of the following two criteria:

Criteria 1: The certificate must identify an ILAC/MRA signatory body accredited laboratory (A2LA, L-A-B, ACLASS, IAS, and PJLA) and has a model number, a serial number and date of calibration. OR

Criteria 2: The certificate must have a statement that the calibration testing conforms to International Organization for Standardization (ISO) 17025, has a documented uncertainty level, measurement results of the device, instrument pass/fail testing, date of calibration, serial number and model number.

Notice: The following table provides a list of thermometers that can be considered as options when providers plan to buy a thermometer. The information in the table, including the price and the specifications, may change over time. Therefore, providers should conduct a detailed search when they plan to buy a thermometer. The North Dakota Department of Health does not recommend or endorse products or manufacturers. This list is a courtesy and is not inclusive of all manufacturers. Providers may purchase thermometers not manufactured by companies on this list, but that also have certificates of calibration that meet program requirements.

Abbreviations:

MRA - Mutual Recognition Arrangements
ILAC- International Laboratory Accreditation Cooperation
A2LA - American Association for Laboratory Accreditation
L-A-B - Laboratory Accreditation Bureau
IAS - International Accreditation Service Inc.
PJLA - Perry Jonson Laboratory Accreditation Service Inc.
ACLASS - ANSI-ASQ National Accreditation Board

Thermometer	Model	Price	Frequency of calibration	Recalibration Price	Manufacturer or distributor	Certificate of Calibration	Min/Max recording	Alarm	Low Battery Indicator	Memory >4,000	Accuracy	Remark	Website
VFC 320 vaccine data logger	VFC320	$428 With probe in glycol with calibration	Every 2 years	$156	Dickson	√	√	√	√	√	±1.8°F from -22 to 122F		www.dicksondata.com/products/VFC320
VFC-5000 LCD TC data logger	VFC-5000 LCD TC	$172 With probe in glycol and data recorder cradle with calibration	Every 2 years	$35	Control solutions, Inc. (Distributor)	√	√	√	√	√	±1°F for data logger	Recommended by other states	www.vfcdataloggers.com/usbtcdatalogger.aspx
TRED30-7R Log Tag data logger	TRED30-7R Log Tag data logger	$198 with glycol and docking station with calibration	Every 2 years	$35	Control solutions, Inc. (Distributor)	√	√	√	√	√	±0.9°F from -4°F~ to +104°F	Recommended by other states	www.vfcdataloggers.com/logtagtred30-7temperaturerecorderwith30daysummarydisplay-1.aspx
Traceable® Memory-Card Refrigerator/Freezer Thermometer	6400-6401	$229	Every 1 years	$85	Control company	√	√	√	Has supplied batteries and adapters	√	±0.5°C (0 to 25°C), ±0.6°C (25 to 70°C)±1.2°C (-30 to 0°C, 50 to 70°C)		http://www.control3.com/6400p.htm
Dickson touch screen logger	FT 625 touch screen	$528 with calibration	Every 2 years	$156	Dickson	√	√	√	√	√	±0.44 ºC		www.dicksondata.com/products/FT625
Madge Techs vaccine monitoring system	TC Temp 2000	$599	Every 1 year is recommended	$60	Madge Tech	√	√	√	√	√	±0.5 ºC (0 to 50°C)		www.instrumart.com/assets/vtms-Datasheet.pdf
PharmAlarm™ 1 Digital Alarm thermometer	Pharm Alarm 1	$39 with glass beads	Every 1 year is recommended	$10	Thermo works	√	√	√	√	No data logger	±1°F between -4°F to 122°F		www.thermoworks.com/products/alarm/pharmalarm1.html
Jumbo Display Traceable® Memory Monitoring Refrigerator Freezer Thermometer	17752/1	$65/59 with glycol filled bottle		$17.50	Health care logistics (Distributor)	√	√	√	√	No data logger	±1°C		http://shop.gohcl.com/default.aspx?page=item%20detail&itemcode=17751
Traceable® Hi-Accuracy Refrigerator Thermometer - 1 bottle	17988	$94 with glycol		$44	Health care logistics (Distributor)	√	√	√	√	No Data logger	±0.30ºC		http://shop.gohcl.com/default.aspx?page=item+detail&itemcode=17988

Please contact the North Dakota Immunization Program at 701.328.3386 or 800.472.2180 with any questions.

FAHRENHEIT (°F) TEMPERATURE LOG FOR REFRIGERATOR

NORTH DAKOTA DEPARTMENT OF HEALTH

SFN 53775 (07-13)

Provider ID:	Refrigerator Name/Description:	Month:

REFRIGERATOR 35 to 46° F

Day of Month	Time	Staff Initials		Aim for 40°F												<35°F or >46°F	Minimum/Maximum Temperatures	
				35	36	37	38	39	40	41	42	43	44	45	46		Minimum	Maximum
1			AM PM															
2			AM PM															
3			AM PM															
4			AM PM															
5			AM PM															
6			AM PM															
7			AM PM															
8			AM PM															
9			AM PM															
10			AM PM															
11			AM PM															
12			AM PM															
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23			AM PM															
24			AM PM															
25			AM PM															
26			AM PM															
27			AM PM															
28			AM PM															
29			AM PM															
30			AM PM															
31			AM PM															

DANGER! Fridge temperatures below 35°F are too cold! Record temperature to the right and take action immediately!

DANGER! Fridge temperatures above 46°F are too warm! Record temperature to the right and take action immediately!

Place an "**X**" in the box that corresponds with the temperature (columns), day of the month and AM/PM (rows) for your temperature check. Enter your initials and the time you monitored the temperature in the appropriate boxes on the left. Write the minimum and maximum temperatures in number in the boxes on the right. Make sure to clear the Min/Max recordings daily.**Temperatures out of range require immediate action. Write the exact temperature the right and record the detailed information on the back of the form. Please keep this temperature log for at least 3 years.**

North Dakota Immunization Program: 800.472.2180. **Please fax temperature logs to confidential fax number 701.328.0355 monthly.**

CELSIUS (˚C) TEMPERATURE LOG FOR REFRIGERATOR

NORTH DAKOTA DEPARTMENT OF HEALTH

SFN 58468 (07-13)

Provider ID:	Refrigerator Name/Description:	Month:

REFRIGERATOR 2 to 8° C

Day of Month	Time	Staff Initials		Aim for 5°C							<2℃ or >8℃	Minimum/Maximum Temperatures	
				2	3	4	5	6	7	8		Minimum	Maximum
1			AM / PM										
2			AM / PM										
3			AM / PM										
4			AM / PM										
5			AM / PM										
6			AM / PM										
7			AM / PM										
8			AM / PM										
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28			AM / PM										
29			AM / PM										
30			AM / PM										
31			AM / PM										

DANGER! Fridge temperatures below 2°C are too cold! Record temperature to the right and take action immediately!

DANGER! Fridge temperatures above 8°C are too warm! Record temperature to the right and take action immediately!

Place an "**X**" in the box that corresponds with the temperature (columns), day of the month and AM/PM (rows) for your temperature check. Enter your initials and the time you monitored the temperature in the appropriate boxes on the left. Write the minimum and maximum temperatures in number in the boxes on the right. Make sure to clear the Min/Max recordings daily.**Temperatures out of range require immediate action. Write the exact temperature on the right and record the detailed information on the back of the form. Please keep this temperature log for at least 3 years.**

North Dakota Immunization Program: 800.472.2180. **Please fax temperature logs to confidential fax number 701.328.0355 monthly.**

FAHRENHEIT (°F) TEMPERATURE LOG FOR FREEZER

NORTH DAKOTA DEPARTMENT OF HEALTH

SFN 53775 (07-13)

Provider ID:	Freezer Name/Description:	Month:

FREEZER -58 to +5°F

Day of Month	Time	Staff Initials		For temperatures (-58 to -5) write in number											<-58 or >5°F	Minimum/Maximum Temperatures	
				-58 to -5	-4	-3	-2	-1	0	1	2	3	4	5		Minimum	Maximum
1			AM PM														
2			AM PM														
3			AM PM														
4			AM PM														
5			AM PM														
6			AM PM														
7			AM PM														
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29			AM PM														
30			AM PM														
31			AM PM														

DANGER! Freezer temperatures below -58°F are too cold! Record temperature to the right and take action immediately!

DANGER! Freezer temperatures above 5°F are too warm! Record temperature to the right and take action immediately!

Place an "**X**" in the box that corresponds with the temperature (columns), day of the month and AM/PM (rows) for your temperature check. Enter your initials and the time you monitored the temperature in the appropriate boxes on the left. Write the minimum and maximum temperatures in number in the boxes on the right. Make sure to clear the Min/Max recordings daily.**Temperatures out of range require immediate action. Write the exact temperature on the right and record the detailed information on the back of the form. Please keep this temperature log for at least 3 years.**

North Dakota Immunization Program: 800.472.2180. **Please fax temperature logs to confidential fax number 701.328.0355 monthly.**

CELSIUS (°C) TEMPERATURE LOG FOR FREEZER

NORTH DAKOTA DEPARTMENT OF HEALTH

SFN 58468 (07-13)

Provider ID:	Freezer Name/Description:	Month:

FREEZER -50 to -15 °C

Day of Month	Time	Staff Initials		For temperatures (-50 to -25) write in number											<-50 or >-15°C	Minimum/Maximum Temperatures	
				-50 to -25	-24	-23	-22	-21	-20	-19	-18	-17	-16	-15		Minimum	Maximum
1			AM														
			PM														
2			AM														
			PM														
3			AM														
			PM														
4			AM														
			PM														
5			AM														
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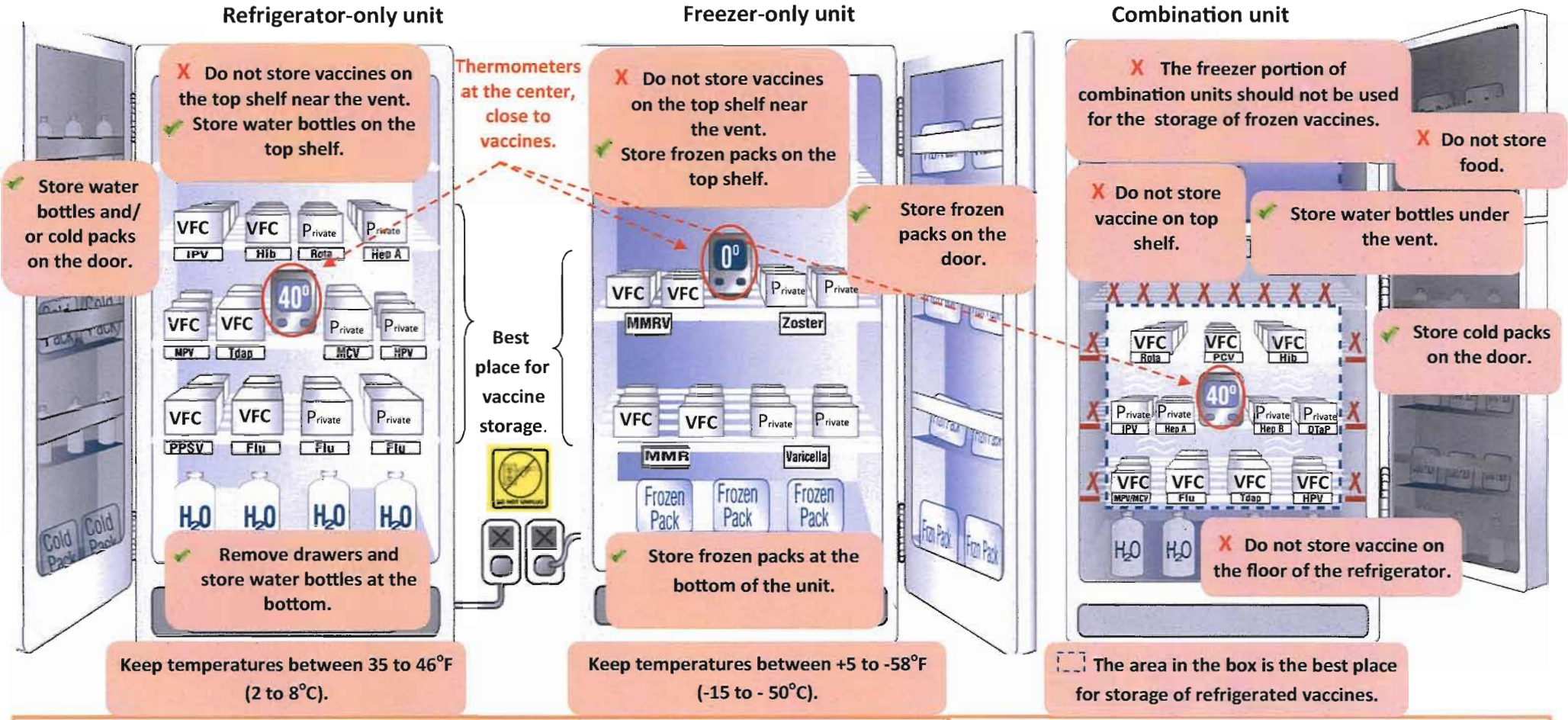
DANGER! Freezer temperatures below -50°C are too cold! Record temperature to the right and take action immediate!

DANGER! Freezer temperatures above -15°C are too warm! Record temperature to the right and take action immediate!

Place an "X" in the box that corresponds with the temperature (columns), day of the month and AM/PM (rows) for your temperature check. Enter your initials and the time you monitored the temperature in the appropriate boxes on the left. Write the minimum and maximum temperatures in number in the boxes on the right. Make sure to clear the Min/Max recordings daily.**Temperatures out of range require immediate action. Write the exact temperature on the right and record the detailed information on the back of the form. Please keep this temperature log for at least 3 years.**

North Dakota Immunization Program: 800.472.2180. **Please fax temperature logs to confidential fax number 701.328.0355 monthly.**

Best Practices for Vaccine Storage and Handling



Do

- Place your thermometer probe (glycol bottle) at the center. Use a certified, calibrated thermometer.
- Store water bottles in refrigerators and frozen packs in freezers.
- Store vaccines in a breathable plastic bin or basket in their original package.
- Label your vaccines as VFC, private, adult and pediatric.
- Store vaccines 2-3 inches away from the wall of the unit or from other vaccines.
- Limit the number of times the unit is opened to prevent light and temperature exposure.
- Keep vaccines with shorter expiration dates to the front of the shelf and rotate the stock every week.
- Maintain the refrigerator and freezer by regularly cleaning the coil, the motor and the interior part.
- Give a space of at least 4-6 inches of clearance between the unit and the wall of the room.
- Place your refrigerator or freezer in a well ventilated room.
- Post the "Do not unplug" warning sign around power outlets.

Don't

- X Remove vaccines from their original package.
- X Store vaccines on the door of a unit.
- X Store vaccines near the vent of a refrigerator.
- X Store food in the refrigerator or freezer.
- X Store vaccines on the bottom or top shelves.
- X Store vaccines close to the wall of the unit.
- X Expose vaccines to sun light or fluorescent light.
- X Store expired vaccines in your units.

If you have questions, please contact the ND Immunization Program at: 701.328.3386 or toll-free at 800.472.2180.

Vaccine Storage Troubleshooting Guide

IF YOU NOTICE A TEMPERATURE EXCURSION:

1. Contact the primary or backup vaccine coordinator.
2. Document the current, minimum and maximum temperatures, duration of temperature excursion and the time when problem was discovered in the table below.
3. Label the vaccine "Do Not Use."
4. Store at the appropriate temperature. If your unit is not maintaining the appropriate temperature, transfer the vaccine to other storage units. Do not allow vaccines to remain in a unit while trying to fix it.
5. Contact the manufacturer for further guidance on use of the vaccine using the phone numbers provided below. Do not discard vaccine before contacting the manufacturer. If vaccine is wasted, report to the Immunization Program.

Storage unit is too cold
<2°C (35°F) for refrigerator
Colder than -50°C (-58°F) for freezer

Storage unit is too warm
>8°C (46°F) for refrigerator
Warmer than -15°C (+5°F) for freezer

Factors that may cause temperature excursion (<2°C)

Thermometer placement: Place at the center and check the temperature every 30 minutes.

Control Knob: Adjust to a warmer position, check temperature every 30 minutes.

Factors that may cause temperature excursion (>8°C)

Power supply: Insert the plug into the wall socket, turn on the control knob and check if you have power supply .

Door: Close the door properly. Check the door seal and hinges.

Thermometer placement: Place at the center and check the temperature every 30 minutes.

Control knob: Adjust the control knob to a colder position and check temperature every 30 minutes.

Air circulation: Check if your unit has good air circulation. Reorganize your vaccines.

Motor and coils: Clean the motor and the coils if it has dust or call a technician for help.

Vaccine manufacturers and their phone numbers

Merck & Co. Inc.	877.829.6372
GlaxoSmithKline	877.356.8368
Novartis	800.244.7668
Sanofi Pasteur	800.822.2463
MedImmune, Inc.	877.633.4411
Pfizer	800.999.9384

Document the information in the table when temperature excursion occurs

Date	Time	Duration	Staff	Temperature			Problem/Action taken	Result
			Initials	Current	Minimum	Maximum		

- Use a certified and calibrated thermometer with probe in glycol that measures liquid temperature for vaccine storage unit.
- Store water bottles in refrigerator and frozen packs in freezer to minimize the risk of temperature excursion.
- Use the appropriate vaccine storage unit to ensure vaccine viability.